



















## Industrial Safety Systems

Safety solutions and services  
for machines and systems

- Contents
- List of product families
- Product selection based on risk assessment
- SICK Online Portal

**SICK**  
Sensor Intelligence.

	Systematic safety		System integration and safety know-how	<b>A</b>
	Services		Services for every phase of a machine's life	<b>B</b>
	Applications		Products and complete solutions for effective operator protection and accident prevention	<b>C</b>
<b>Opto-electronic protective devices</b>	Safety laser scanners		Electro-sensitive protection of hazardous points, hazardous areas and access for stationary and mobile applications	<b>D</b>
	Safety camera system		Electro-sensitive protection of hazardous points and hazardous areas	<b>E</b>
	Safety light curtains		Electro-sensitive protection of hazardous points, hazardous areas and access	<b>F</b>
	Multiple light beam safety devices		Electro-sensitive protection of hazardous areas and access	<b>G</b>
	Single-beam photoelectric safety switches		Electro-sensitive protection of hazardous areas and access	<b>H</b>
	Mirror columns and device columns		Positioning of opto-electronic protective devices in an open room, protection on several sides and muting applications	<b>I</b>
<b>Safety switches</b>	Electro-mechanical safety switches		Safety switches with separate actuator, safety locking devices, safety position switches and safety hinge switches	<b>K</b>
	Non-contact safety switches		Electro-sensitive safety sensors in transponder, magnetic and inductive technology	<b>L</b>
	Safety command devices		Emergency stop pushbuttons, rope pull switches and enabling switches	<b>M</b>
<b>sens:Control – safe control solutions</b>	Safety relays		Enabling safety switches and protective devices to be easily integrated into safety functions on a machine or system	<b>N</b>
	Safety controllers		For the individual solution of independent or mutually interdependent complex safety applications	<b>O</b>
	Network solutions		For machines and systems with high network complexity and programmable controllers	<b>P</b>
<b>Safety software</b>	Safexpert		Software for safety engineering. This software provides step-by-step guidance towards CE certification, support during risk assessment, and simplifies the process of documentation	<b>Q</b>
	Glossary			<b>R</b>

# List of product families

## Opto-electronic protective devices

Safety laser scanners		Safety light curtains		Multiple light beam safety devices	
S3000 Professional	D-3	C4000 Advanced	F-2	M4000 Advanced / UE403	G-2
S3000 Advanced	D-11	C4000 Standard	F-29	M4000 Advanced A/P / UE403	G-2
S3000 Standard	D-19	C4000 ATEX II 3G/3D	F-65	M4000 Standard	G-21
S3000 Remote	D-27	M4000 Advanced Curtain	F-68	M4000 Standard A/P	G-21
S3000 Professional CMS	D-34	C4000 Select	F-87	M4000 Area	G-35
S3000 PROFINET IO Professional	D-41	miniTwin 4	F-105	M2000 Standard	G-46
S3000 PROFINET IO Advanced	D-46	C4000 Micro	F-117	M2000 Standard in IP69K Housing	G-57
S3000 Cold Store	D-51	C4000 Micro in IP69K Housing	F-129	M2000 RES/EDM	G-63
S300 Expert	D-58	C4000 Micro Cold Store	F-136	M2000 Cascadable	G-74
S300 Professional	D-67	C4000 Basic Plus	F-142	M2000 A/P Standard	G-85
S300 Advanced	D-77	C4000 Basic	F-155	M2000 A/P RES/EDM	G-94
S300 Standard	D-86	C4000 Eco	F-168	<b>Single-beam photoelectric safety switches</b>	
S300 Professional CMS	D-94	C4000 Entry/Exit	F-181	L4000/L41	H-2
S200	D-104	C4000 Palletizer	F-192	L4000 System	H-9
S100 Standard	D-113	C4000 Fusion	F-205	WSU/WEU26-3	H-17
S100 Professional	D-121	miniTwin2	F-224	L2000/L21	H-22
<b>Safety camera systems</b>		C2000 Standard	F-236	L2000/L27	H-29
V300 Work Station Extended	E-2	C2000 Standard in IP69K Housing	F-253	L2000/L28	H-34
V200 Work Station Extended	E-8	C2000 Eco	F-261	<b>Mirror columns and device columns</b>	
		C2000 RES/EDM	F-272	Mirror columns with protective field height mirror	I-2
		C2000 Cascadable	F-285	Mirror columns with separate mirrors	I-5
				Device columns with external grooves	I-9
				Device columns for outdoor use	I-15

## Safety switches

Electro-mechanical safety switches		i10P		T4000 Multi	
i11S	K-2	i10R	K-66	T4000 Compact	L-30
i12S	K-6	i110P	K-69	T4000 Direct	L-36
i16S	K-11	i110R	K-72	IN4000 Standard	L-42
i17S	K-17	i10H	K-75	IN4000 Direct	L-48
i18S AS-i	K-22	i110H	K-78		L-52
i110S	K-28	<b>Non-contact safety switches</b>		<b>Safety command devices</b>	
i10 Lock	K-34	RE300	L-2	ES21	M-2
i10 Lock AS-i	K-42	RE11 / RE21 / RE31	L-6	i110RP	M-10
i14 Lock	K-49	RE13 / RE23	L-13	i150RP	M-14
i15 Lock	K-54	RE27	L-18	E100	M-19
i200 Lock	K-60	T4000 Standard	L-23		

## sens:Control – safe control solutions

Safety relays		UE48-30S		UE1140	
UE23-2MF	N-3	UE10-2FG / UE12-2FG	N-52	UE4740	P-42
UE23-3MF	N-7	UE10-30S	N-57	UE3212	P-9
UE42-2HD	N-12	UE10-4XT	N-63	UE4215	P-13
UE43-2MF	N-17	UE11-4DX	N-69	UE4470	P-17
UE43-3MF	N-22	<b>Safety controllers</b>		UE4421	P-24
UE43-3AR	N-27	Flexi Classic	O-2	UE4457	P-32
UE43-4AR	N-31	Flexi Soft	O-25	UE1840	P-42
UE44-3SL	N-35	<b>Network solutions</b>		UE1940	P-42
UE45-3S1	N-40	UE4155	P-2		
UE48-20S	N-46	UE4140	P-42		

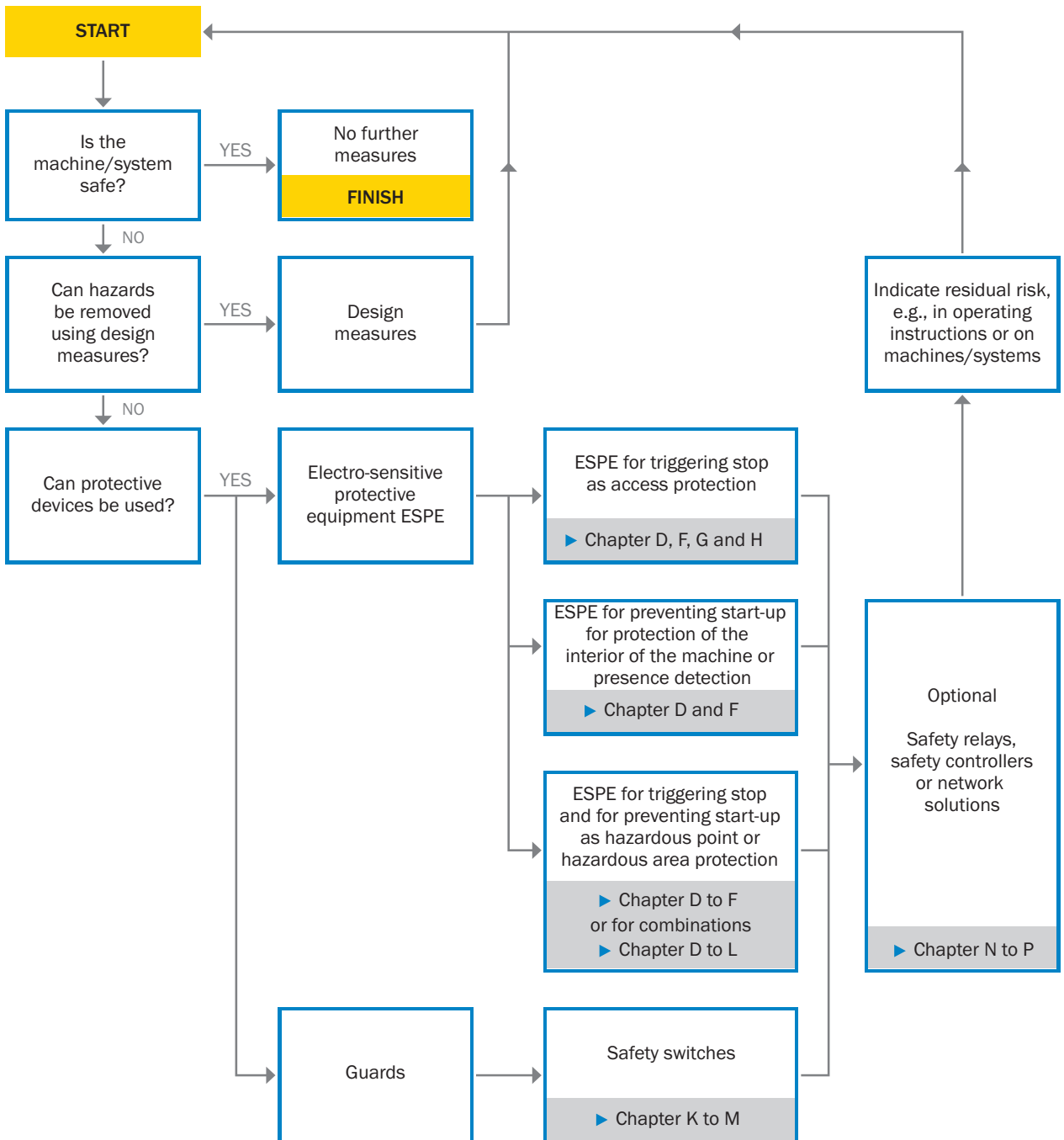
➔ For combinations, see appendix "Sensor systems and safe control solutions from SICK"

# Industrial Safety Systems from SICK.

## Safe to say: more performance!



### Product selection based on risk assessment



**Note:**

The simplified risk analysis process shown here is only intended to provide a quick introduction to product selection. You will find information on the process, in accordance with ISO 12100, in → Chapter A, page A-15 as well as → Chapter Q, Safexpert.

# SICK Online Portal: The quick way to higher efficiency at work



## Work online at [www.mysick.com](http://www.mysick.com)

Fast results instead of tedious searching - with the SICK "Finders." Direct access for everyone, no registration necessary!

- Product search, products and information is linked
- Easy to understand illustrations of applications, connection diagrams and accessories
- Download of technical data, drawings and graphics

### Product Finder

We will quickly guide you right to the appropriate device for your application.

### Applications Finder

Choose an application based on task, industry/market or product group.

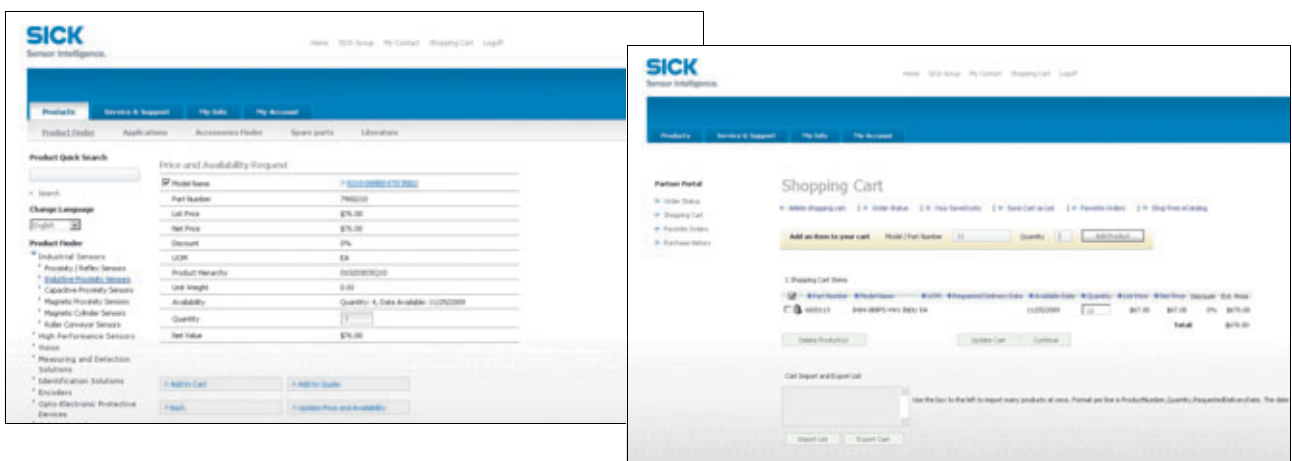
### Literature Finder

Access all publications, e.g., operating instructions, technical information, customer magazines and other literature about SICK products.

Services Finder, Connection Diagram Finder, Spare Parts Finder and Accessories Finder also at [www.mysick.com](http://www.mysick.com).

## Online ordering and management at [www.mysick.com](http://www.mysick.com)

Register – save time and improve safety with online development and planning tools.



### Request price and availability

Find the price and delivery date of the desired products easily and quickly.

### Request for a quote

You can enter a reference number for a quote. The quote is available online. Each quote is confirmed via e-mail.

### Online orders

You can carry out the order process in just a few steps.



### **Experience**

SICK is a technological and market leader in sensor technology. With headquarters in Waldkirch, Germany and more than 5,000 employees in almost 50 subsidiaries, numerous -representatives and holdings, SICK has a solution for your application no matter where you are in the world.

### **Innovation**

SICK achieves product innovation by means of consistent development. It has five development sites in Germany and a total of seven other sites all over the world. SICK turns customers' needs into automation solutions that increase efficiency and reduce costs.

### **Independence**

SICK is large enough to be independent – but still flexible enough to react quickly. As a result, we can concentrate on the development of products the market needs without interference.

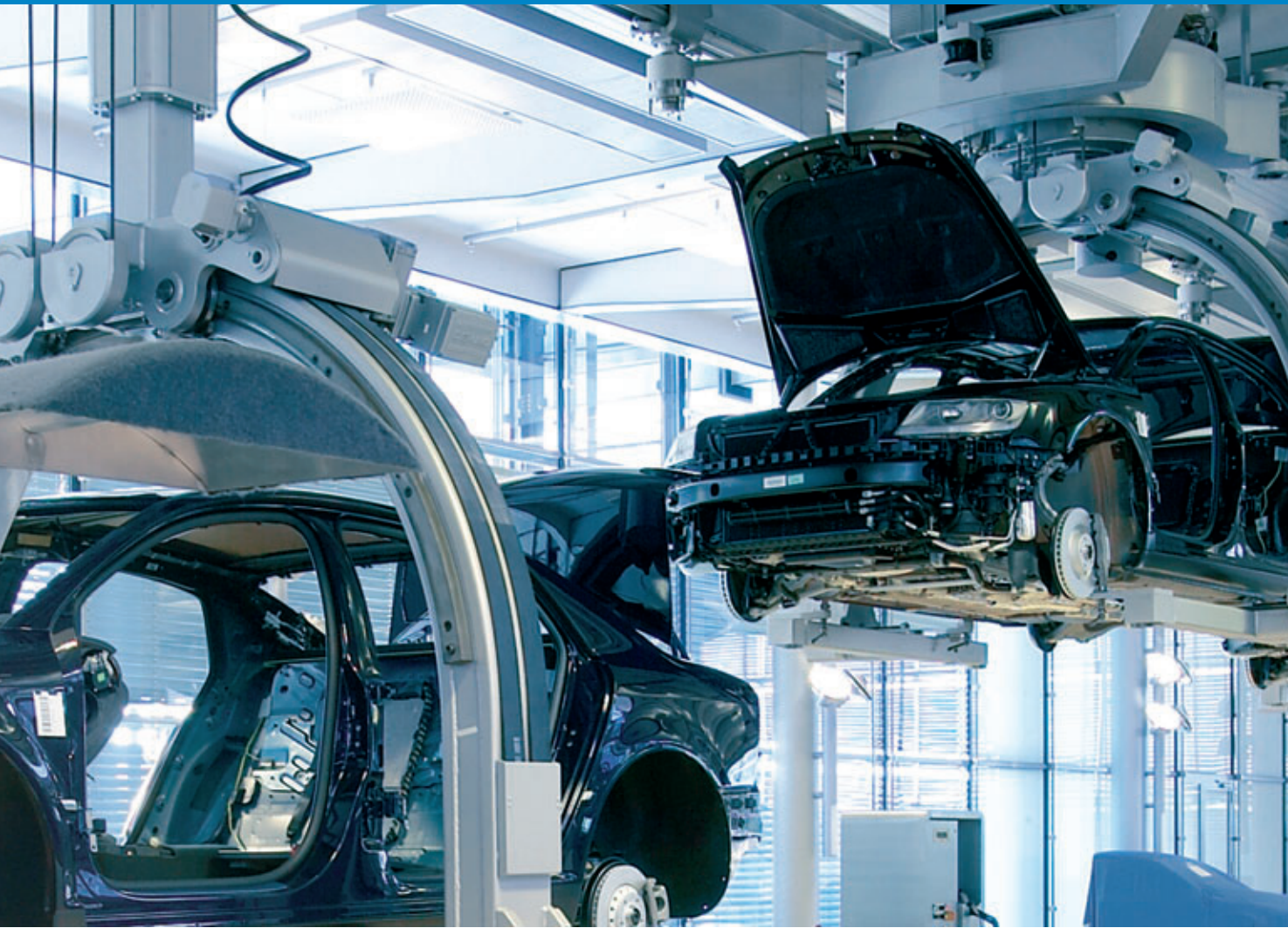


What you get from working with SICK

## We help to increase your efficiency

As a leading manufacturer of automation solutions for industrial applications, we are familiar with the processes in our customers' organizations – and we are particularly familiar with their requirements for increased efficiency.





The focus and how you benefit from it

## **We provide safety**

SICK concentrates strictly on the development and production of sensors for factory, logistics and process automation. The result is innovative, powerful products and systems that provide our customers the highest level of safety and increased quality.



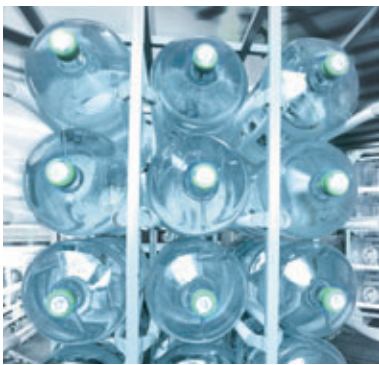


## Openness

The secret behind our success

All sensors in principle work in any automation scenario.

This level of openness provides our customers with maximum freedom and creates the best possible safety solution.



## Factory automation

- Electro-sensitive detection, counting, classification and positioning of objects
- Detection of shape, position and surface differences
- Protection against accidents and protection of people with sensors, safety software and safety services



## Logistics automation

- Automatic identification using bar code and RFID readers for sorting and destination control in industrial material flow
- Detection of volume, position and outline of objects and surroundings using laser measurement systems

Customers' markets and how we view them

## We are familiar with your processes

Sensors from SICK are ideal for all automation in industry, regardless of the type of production processes used or which products are manufactured. For this reason in particular: as a development partner for industry, it is crucial for our success that we are fully familiar with the production steps in every market.

### Versatility

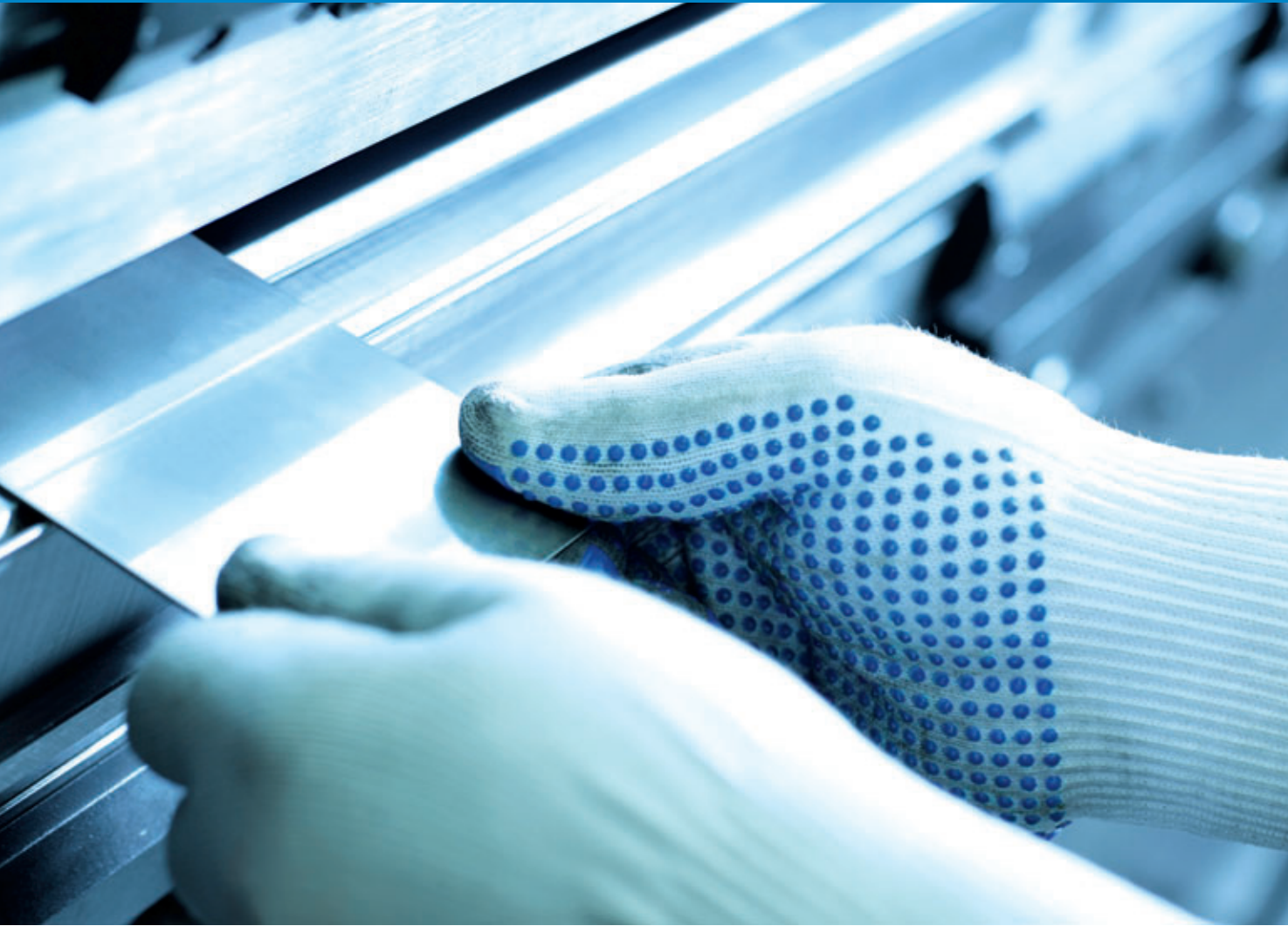
With its specialized market expertise, SICK is your partner in the following markets:

- Automotive
- Robotics
- Pharma & Cosmetics
- Consumer goods
- Food
- Beverage
- Machine tools
- Electronics & Solar
- Wood
- Print & Paper
- Textile
- Courier Express Parcel, Postal & Cargo
- Warehouse & Distribution
- Mobile vehicles
- Ports
- Traffic
- Airports
- Building automation

### Automotive industry

Our holistic view of optimization potential makes automated processes safer, faster and more transparent. The result is increased plant availability, while at the same time providing safety for workers and machines.





### Food & beverage

With comprehensive knowledge, SICK understands every detail in automated production and handling. Perfectly matched sensors ensure plant safety and meet stringent hygienic requirements.



### Logistics

In an increasingly global economy, the demands on logistics processes are growing steadily. With tailor-made solutions and products for control, -identification, monitoring and measuring, SICK ensures customers have an efficient logistics chain.



# Seeing details, understanding the big picture

SICK is a worldwide leading manufacturer of intelligent sensors and sensor solutions for all areas of factory, logistics and process automation. The company's comprehensive product portfolio is always oriented to delivering customer benefits. Years of practical experience and thousands upon thousands of application solutions go into creating precisely those products that will support your effort to design processes more efficiently and economically. SICK sensors take on tasks like measuring, detecting, safeguarding, identifying and positioning, for example. And they do the job in all areas of industrial production and logistics.

SICK sensors are almost everywhere: they detect production differences and quality deviations, and optimize workflows in all automated production processes. As part of accident prevention and personal protection, they safeguard access to robot stations and automatic conveyor sections, and they ensure the efficient flow of material in automatic identification systems.

**Let's talk about the best solution to your automation tasks.**

**For more products see [www.mysick.com](http://www.mysick.com)**

## Industrial sensors

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- Photoelectric sensors
- Inductive proximity sensors
- Capacitive proximity sensors
- Magnetic proximity sensors
- Magnetic cylinder sensors

## Identification solutions

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- Bar code scanners
- Camera-based code readers
- Hand-held scanners
- RFID

## Measuring and detection solutions

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- Laser measurement technology
- Level sensors
- Pressure sensor

## System solutions

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- Volume measurement systems
- Code reading systems
- Hybrid systems and further system solutions

## Registration sensors

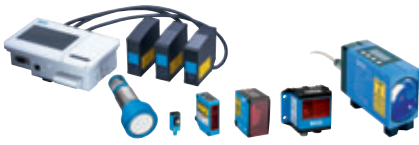
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- Contrast sensors
- Color sensors
- Luminescence sensors
- Fork sensors
- Array sensors

## Distance sensors

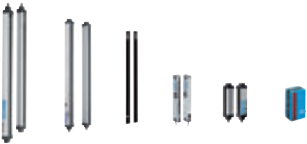
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- Short range distance sensors (displacement)
- Mid range distance sensors
- Long range distance sensors
- Linear measurement sensors
- Ultrasonic sensors
- Optical data transmission
- Position finders

## Automation light grids

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- High end automation light grids
- Standard automation light grids
- Smart light grids

## Vision

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- Vision sensors
- Smart cameras
- 3D cameras
- Vision illuminations

## Opto-electronic protective devices

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- Safety laser scanners
- Safety camera systems
- Safety light curtains
- Multiple light beam safety devices
- Single-beam photoelectric safety switches
- Mirror and device columns
- Upgrade kits

## Safety switches

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- Electro-mechanical safety switches
- Non-contact safety switches
- Safety command devices

## sens:Control – safe control solutions

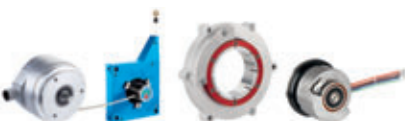
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- Safety relays
- Safety controllers
- Network solutions

## Encoders

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- Motor feedback systems
- Positioning encoders

A



Safety, efficiency and more: safetyPLUS®

## Complete solution for effective health and safety protection

For more than 60 years, SICK has developed innovative solutions. By offering the world's most comprehensive safety portfolio, we set international standards for performance and functionality. This makes us the leading provider of advanced products and services related to industrial safety.

### Experience and competence

safetyPLUS® is a holistic safety concept offering a unique range of services. safetyPLUS® ensures each application adheres to the appropriate safety directives and standards to provide optimum protection for both man and machine. In addition, a comprehensive safety concept based on safetyPLUS® saves time and money.

### High technology and system openness

We provide complete safety applications from a versatile product portfolio. SICK is dedicated to providing seamless integration in all safety and system environments.



Ethernet

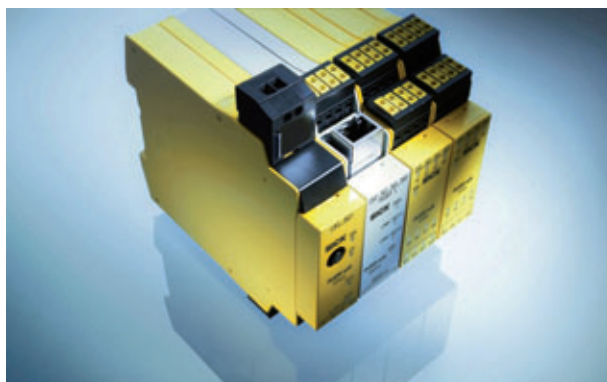




### Simple, clever safety solutions

We offer trend-setting products and application-oriented functionality. safetyPLUS® provides a unique, all-encompassing package that includes safety switches, opto-electronic sensors, safety camera systems, and safe control solutions and networks.

SICK technology is easy to use and will continue to meet changing industry demands.



### Comprehensive services

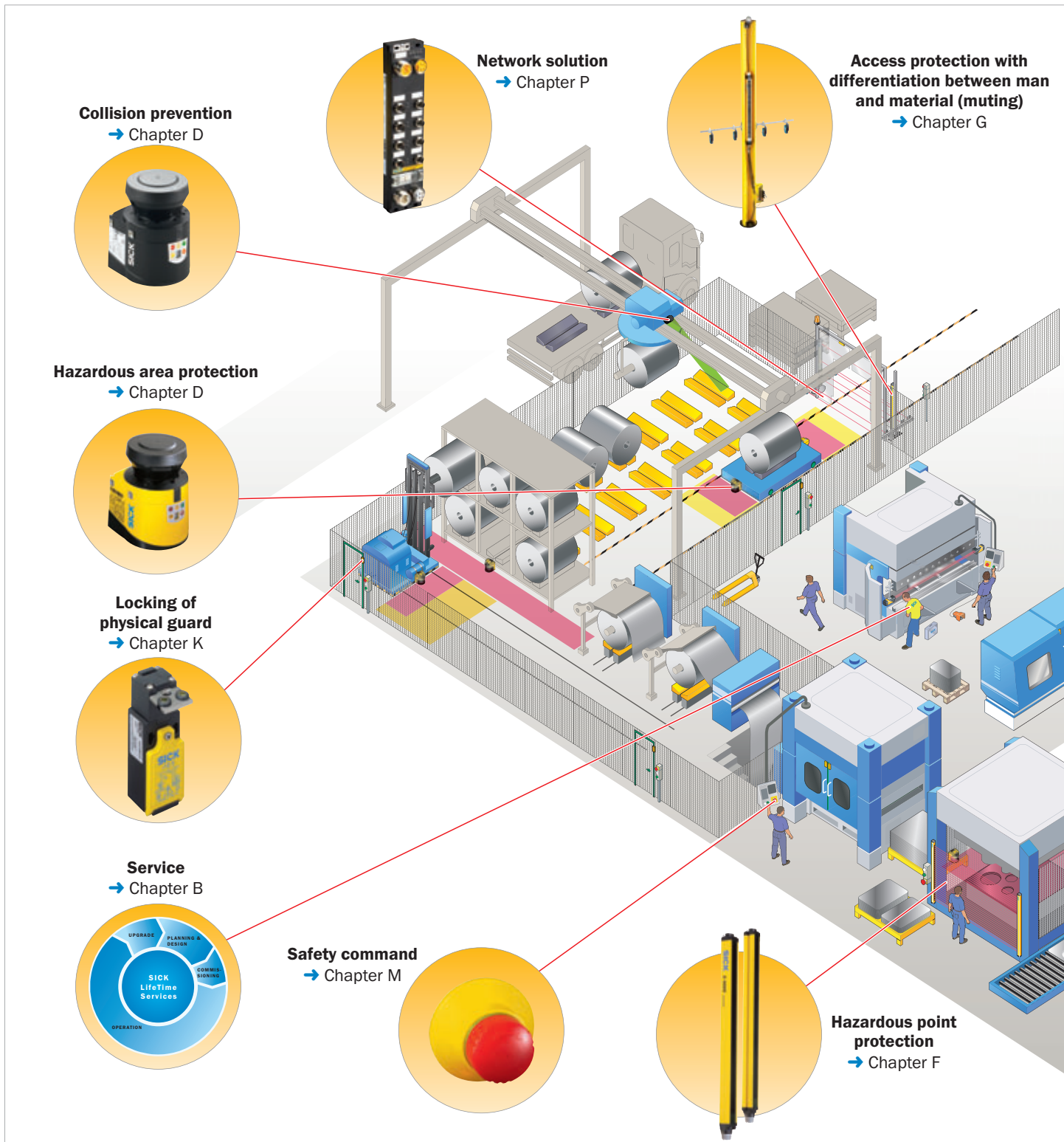
Our safety solutions not only comply with statutory requirements, but we also provide high-quality service support. Customers receive: CE conformity advice, application support, support during commissioning, accredited inspection services, product support, service upgrades, service contracts and training courses. From your first installation to your monthly maintenance check-up, the experts at SICK will accompany you through every phase of the project.



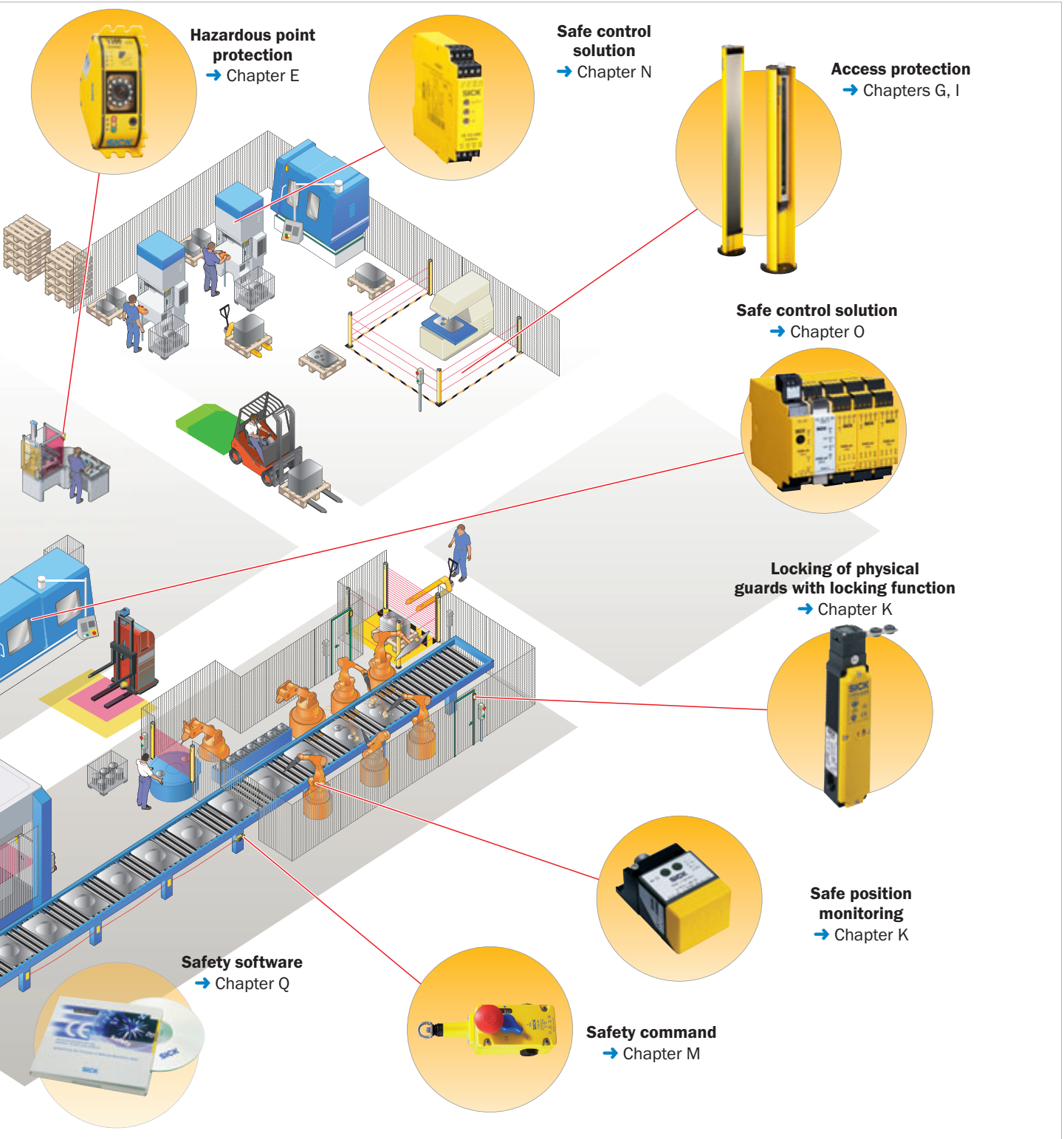


# A safetyPLUS®

SICK safety solutions are available for all safety tasks on machines and systems. A comprehensive product portfolio is supplemented by safety software, engineering tools, services, and seminars related to machine safety.


















A

# SICK safety solutions with safe fieldbuses and standard fieldbuses

The outputs (contacts, OSSDs) on all safety sensors and switches can be integrated into safe fieldbuses and standard fieldbuses using appropriate controllers or remote I/O (see p. A-6).

The SICK-specific EFI and SDL interfaces (see p. A-8) transfer additional data that can be used for process optimization. SICK supplies corresponding gateways and control components.

Device type	Enclosure rating			AS-Interface Safety at Work 	DeviceNet Safety 	Safe fieldbuses		PROFINET IO with PROFIsafe 	
	IP 20	IP 65	IP 67			PROFIBUS with PROFIsafe 	PROFINET IO with PROFIsafe 		
<b>Opto-electronic protective devices</b>									
	Safety laser scanners	–	✓	–	–	–	–	●	→ D-41, D-46
	Safety laser scanners with EFI/SDL	–	✓	–	–	○ 1	○ 3	○ 3	
<b>Safety light curtains with EFI/SDL</b>									
	C4000 Advanced	–	✓	–	–	○ 1	○ 3	○ 3	
	M4000 Advanced Curtain	–	✓	–	–	○ 1	○ 3	○ 3	
	C4000 Standard	–	✓	–	–	○ 1	○ 3	○ 3	
	C4000 Entry/Exit	–	✓	–	–	○ 1	○ 3	○ 3	
	C4000 Palletizer	–	✓	–	–	○ 1	○ 3	○ 3	
	C4000 Fusion	–	✓	–	–	○ 1	○ 3	○ 3	
	Multiple light beam safety devices	–	✓	–	●	–	–	–	→ G-21
	<b>Multiple light beam safety devices with EFI/SDL</b>								
	M4000 Advanced	–	✓	–	–	○ 1	○ 3	○ 3	
	M4000 Advanced A/P	–	✓	–	–	○ 1	○ 3	○ 3	
	M4000 Area	–	✓	–	–	○ 1	○ 3	○ 3	
<b>Electro-mechanical safety switches</b>									
	<b>Safety switches with separate actuator</b>								
	i18-S205	–	–	✓	●	–	–	–	→ K-22
	<b>Safety locking devices</b>								
	i10-M0455 Lock	–	–	✓	●	–	–	–	→ K-42
	i10-E0455 Lock	–	–	✓	●	–	–	–	→ K-42

● Direct interfacing to fieldbuses












○ 1 ... 3 Indirect interfacing to fieldbuses via EFI/SDL, see A-8

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">standard</div> <h3>Standard fieldbuses</h3> </div>							
PROFINET IO	PROFIBUS-DP	Ethernet TCP/IP	Ethernet IP	AS-Interface	DeviceNet	Modbus TCP	CANopen
							
● → D-41, D-46	–	–	–	–	–	–	–
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
–	–	–	–	● → G-21	–	–	–
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
○ 2	○ 2 / ○ 3	○ 2 / ○ 3	○ 2	–	○ 1	○ 2	○ 2 / ○ 3
–	–	–	–	● → K-22	–	–	–
–	–	–	–	● → K-42	–	–	–
–	–	–	–	● → K-42	–	–	–

A

# SICK safety solutions with safe fieldbuses and standard fieldbuses


Continued from pages A-4, A-5

Device type	Enclosure rating			AS-Interface Safety at Work 	DeviceNet Safety 	Safe fieldbuses		
	IP 20	IP 65	IP 67			PROFIBUS with PROFI-safe  	PROFINET IO with PROFI-safe  	
<b>sens:Control – Safe control solutions</b>								
 ○ 1 DeviceNet Safety network solution	✓ <sup>1)</sup>	–	✓	–	● → P-17, P-24, P-32	–	–	–
 Modular safety controller Flexi Classic	✓	–	–	–	–	–	–	–
 ○ 2 Modular safety controller Flexi Soft	✓	–	–	–	–	○ 3	–	–
 AS-Interface Safety at Work slaves	–	✓	✓	● → P-9, P-13	–	–	–	–
 ○ 3 EFI gateways	✓	–	–	–	–	● → P-42	● → P-42	–

● Direct interfacing to fieldbuses

○ Indirect interfacing to fieldbuses via EFI/SDL

<sup>1)</sup> No EFI/SDL

<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">standard</div> <div style="margin-left: 10px;"> <h3>Standard fieldbuses</h3> </div> </div>							
PROFINET IO	PROFIBUS-DP	Ethernet TCP/IP	Ethernet IP	AS-Interface	DeviceNet	Modbus TCP	CANopen
							
—	—	—	—	—	● → P-17, P-24, P-32	—	—
● → 0-2	● → 0-2	● → 0-2	● → 0-2	—	● → 0-2	● → 0-2	● → 0-2
● → 0-25	● → 0-25	● → 0-25	● → 0-25	—	—	● → 0-25	●
—	—	—	—	● → P-9	—	—	—
—	● → P-42	● → P-42	—	—	—	—	● → P-42

## A Enhanced interface function EFI/SDL

The SICK-specific EFI and SDL interfaces are used for safe data transfer and enhanced functionality and diagnostic capabilities.

SICK provides corresponding gateways and control components. (see page A-4 to A-7 and A-9)

### Integration via OSSDs

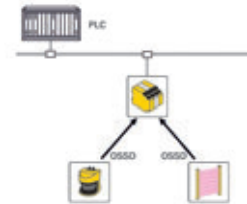
The OSSD output (OSSD = output signal switching device) is the safe output signal switching device on an opto-electronic protective device (e.g., C4000 a safety light curtain, S3000 safety laser scanner).

If the protective field is interrupted, the safety sensor switches the output signal switching devices (OSSDs) to the OFF state. This initiates the shutdown of the machine or the shutdown of the dangerous state.

Each safety sensor has two OSSD outputs that operate in parallel. Depending on the required level of safety, these outputs must be evaluated separately (dual-channel).

For example, connecting opto-electronic protective devices to a safety relay or a safety controller for category 3 acc. to EN 954-1 or Performance Level d acc. to EN ISO 138491 is done using 2 OSSD outputs on the opto-electronic protective device. When safety sensors are integrated using OSSDs, bi-directional communication is not possible. The safety sensor signals the status

information "protective field clear." This status information is evaluated in the safety controller or in the safety relay. Diagnostics via the safety controller are not possible.



#### Advantage:

- Shortest response time for short minimum distances to the hazardous area
  - space-saving machine design

### Integration via EFI

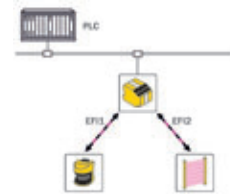
The SICK-specific EFI (EFI = Enhanced Function Interface) was developed to provide safe communication between opto-electronic protective devices, safety controllers or gateways.

Using this EFI, it is not only possible to perform diagnostics and to transfer the process data from several users with little installation effort, but the functionality of the individual protective device is also expanded and the extensive diagnostics information is available to all EFI users.

Expanded functionality means:

- Simultaneous protective field evaluation (S3000 safety laser scanner)
- Protective field switching
- Operating mode switching
- Sampling of status signals (e.g., contamination of the front screen)

EFI provides a quick overview of the entire system configuration, which means increased capacity to act, and therefore, increased machine availability.



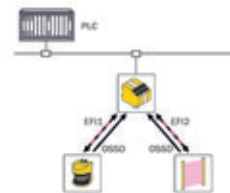
#### Advantage:

- Higher system availability
- Easy, flexible configuration with the ability to switch protective device functions via the system safety controller

### Integration via SDL

To perform diagnostics and to achieve the fastest response times, SICK makes it possible to connect multiple sensors to the safety controller using the interaction of EFI and OSSDs (abbreviation SDL = Safety Data Link).

By means of this optimal EFI and OSSD connection, the EFI users can communicate with each other and the machine can be switched to a safe state as quickly as possible.



#### Advantage:

- Shortest response time for short minimum distances to the hazardous area
  - space-saving machine design
- Higher system availability
- Easy, flexible configuration with the ability to switch protective device functions via the system safety controller

# SICK safety solution with standard communication interfaces





A

Safety sensors and control solutions from SICK can be easily and effectively integrated at the system level into your automation environment via standard communication interfaces.

As a result, it is possible to set parameters and perform diagnostics via the standard protocol used.

You will find a selection guide of standard technologies and compatible devices in this overview.

- TCI  
Tool Calling Interface
- FDT  
Field Device Tool
- DTM  
Device Type Manager

Protocol	TCI		FDT/DTM			
	PROFIBUS	PROFINET	PROFIBUS	PROFINET	Ethernet TCP/IP	Serial
<b>Opto-electronic protective devices</b>						
 Safety laser scanners with EFI/SDL	S200	—	—	—	—	● → D-104
	S300	○	○	○	—	○ ● → D-58
	S3000	○	● → D-41, D-46	○	● → D-41, D-46	○
 Safety light curtains with EFI/SDL	C4000	○	○	○	—	○ ● → F-1
 Multiple light beam safety devices with EFI/SDL	M4000	○	○	○	—	○ ● → G-1
<b>sens:Control — Safe control solutions</b>						
 Safety controller and safety remote I/O with EFI/SDL	UE44xx	—	—	—	—	● → O-1
	Flexi Soft	—	—	—	—	● → O-25 ● → O-25
 ○ EFI gateways	EFI gateways	● → P-42	● → P-42	● → P-42	—	● → P-42 ● → P-42

● Direct interfacing

○ Interfacing via EFI

A

# Selection of opto-electronic protective devices




## Opto-electronic protective devices and safety standards

Up until the end of 2009, the necessary level of safety for a control function was defined by machine designers during the risk analysis and risk assessment stages, which predominantly used categories B, 1, 2, 3, 4 in EN 954-1.

For the technical protective measures, opto-electronic protective devices (ESPE) were used, among other devices. These devices are classified by types 2, 3 and 4 in accordance with the IEC 61496 series of standards.

Based on the type, a direct reference was established to categories 2, 3 and 4 in EN 954-1 (see table below).

### Risk reduction

Minor risk reduction		Examples from SICK	
Category in accordance with EN ISO 13849-1 or EN 954-1	Type according to IEC 61496		
2	2		L2000 single-beam photoelectric safety switch M2000 multiple light beam safety device C2000 safety light curtain miniTwin2 safety light curtain S200 safety laser scanner V200 safety camera system
3	3		S300 safety laser scanner V300 safety camera system
4	4		L4000 single-beam photoelectric safety switch M4000 multiple light beam safety device C4000 safety light curtain miniTwin4 safety light curtain
High risk reduction			

The greater the risk reduction required, the higher the category and therefore the higher the ESPE type.

EN 954-1 has been further developed into EN ISO 13849-1 in which the reliability of safe control functions is defined using the Performance Level (PL) a, b, c, d and e.

The PL e represents the highest level. Along with the structural requirements described by the categories, the probability of a dangerous failure, measures to detect failures and to control failures, the prevention or control of systematic failures and the

quality of the design process are also included or addressed in more detail during the assessment.

EN 62061 with the Safety Integrity Level (SIL) 1, 2 and 3 takes the same approach. The following information applies similarly to the Safety Integrity Level (SIL) required.



## Is taking into account only the PL enough to select an opto-electronic protective device?

Unlike simple control systems, such as electronic safety switches, opto-electronic protective devices must consider additional criteria.

This additional criteria includes the necessary detection capability, which is defined by optical principles, and the reliability of the detection capability defined in the IEC 61496 series of standards (see table below).

### Additional requirements from EN ISO 13849-1 and IEC 61496

Functional safety	Resistance to environmental effects	Electromagnetic compatibility	Detection capability
<p>EN ISO 13849-1 primarily describes requirements regarding the functional safety of safety-related parts of control systems:</p> <ul style="list-style-type: none"> <li>▪ structure (categories)</li> <li>▪ probability of dangerous failure</li> <li>▪ measures to prevent failures and to detect failures</li> <li>▪ prevention or control of systematic failures</li> <li>▪ quality of the design process</li> <li>▪ documentation</li> </ul>		<p>IEC 61496 describes the requirements on opto-electronic protective devices:</p> <ul style="list-style-type: none"> <li>▪ construction of the ESPE</li> <li>▪ optical features</li> <li>▪ detection capability</li> <li>▪ reliability of the detection capability</li> <li>▪ EMC</li> <li>▪ structure (categories)</li> </ul>	
<p><b>PL</b> EN ISO 13849-1</p>		<p><b>Type</b> IEC 61496</p>	<p>+</p>

## Consideration of the optical features

The detection capability describes the capability to safely detect objects of a certain size (e.g., 14, 30, 40 mm for safety light curtains) that will cause the outputs (OSSDs) to shut down on the opto-electronic protective device.

Detection capability is one of the primary parameters employed to define use, e.g., for finger, hand or body detection and the minimum distance from the hazardous point.

The reliability of the detection capability is determined by the classification type. The requirements on type 4 devices are higher than type 2.

Requirements for optical interference sources (sunlight, different types of lamps, devices of the same design, etc.), reflective surfaces, incorrect alignment in normal operation and on diffuse reflection play an important role in determining the detection capability of safety laser scanners (see table p. A-12).

A

## Main differences between ESPE of type 2 and type 4 according to IEC 61496

	Type 2	Type 4	Advantage of type 4
Functional safety	Between the test intervals, the protective function may be lost during a failure.	The protective function is retained even during several failures.	Higher risk reduction
EMC (electromagnetic compatibility)	Basic requirements	Increased requirements	Higher reliability of the detection capability  Higher system availability in difficult ambient conditions.  Installation closer to the machine → saves space
Maximum field of view of the optics <sup>1)</sup>	10°	5°	
Minimum distance a to reflective surfaces over a distance D of < 3 m	262 mm	131 mm	
Minimum distance a to reflective surfaces over a distance D of > 3 m	 = distance × tan (10°/2)	= distance × tan (5°/2)	
Several senders of the same design in a system (workplace)	No special requirements (Beam coding is recommended)	No effect; however, if affected, OSSDs switch off	

<sup>1)</sup> The limitation on the maximum field of view of the optics for type 4 devices to 5° reduces the probability of the failure to detect objects due to reflective effects and, therefore, reduces the probability of a dangerous failure.

**Important**

For selection of opto-electronic protective devices, the product's classification as well as Performance Level must be taken into account in order to achieve the necessary risk reduction.

## Type 2 or type 4?

The current IEC 61496 does not yet contain any relationship between the type classes and PL or SIL. As a result, the designer must rely on extensive experience or additional support.

The following factors aid in the selection of either type 2 or 4 for AOPDs (single-beam photoelectric safety switches, multiple light beam safety devices, safety light curtains), which are recommended by SICK (date July 2010):

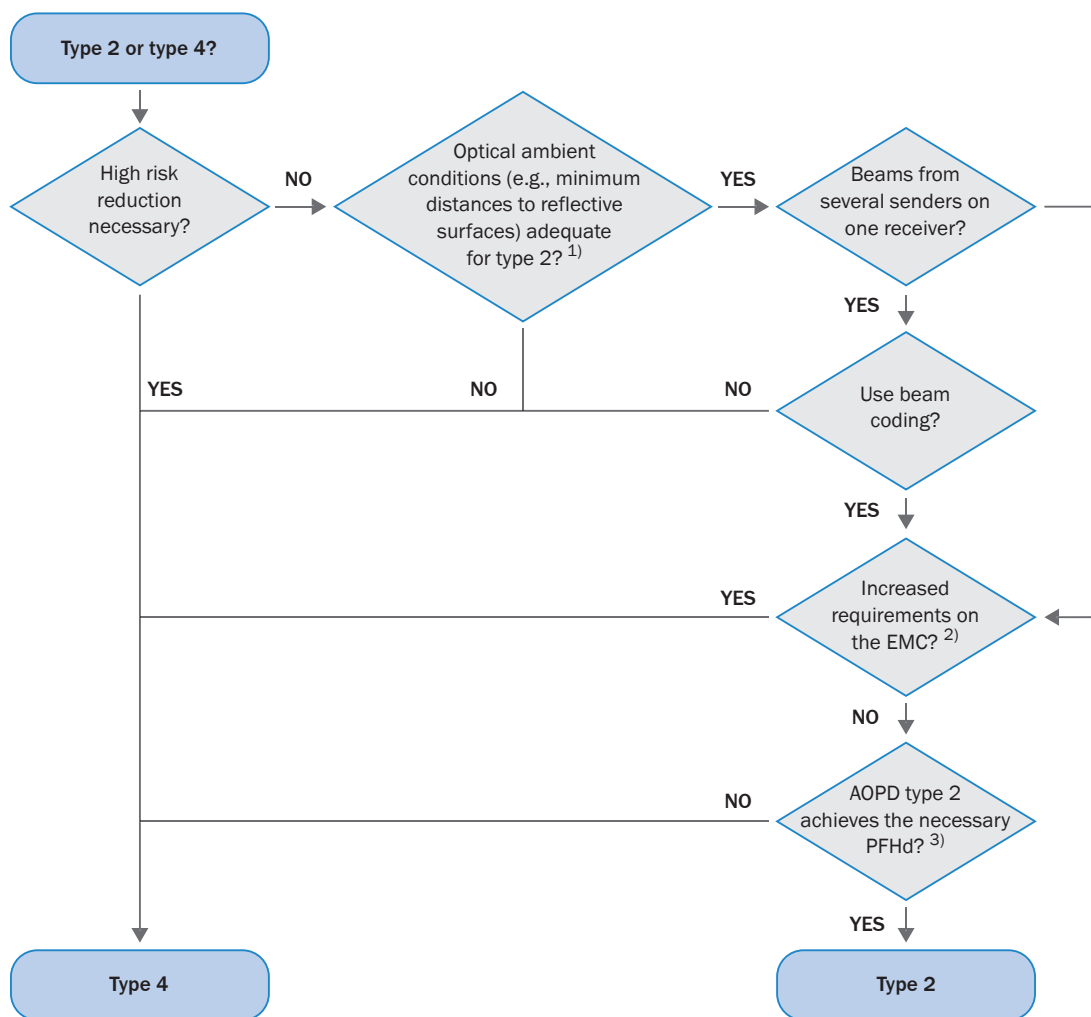
### 1. Consideration of C-type standards

Take into account the definitions in the existing C-type standards (product standards for special machine types).

See list of standards in the Official Journal of the European Union: [→ www.ec.europa.eu/enterprise](http://www.ec.europa.eu/enterprise).

### 2. Scheme for the selection of the necessary AOPD type

If the definitions in the C-type standards are not yet adapted to the new safety standards or there is no suitable C-type standard, the following scheme can be used:



<sup>1)</sup> Optical ambient conditions, → page A-12.

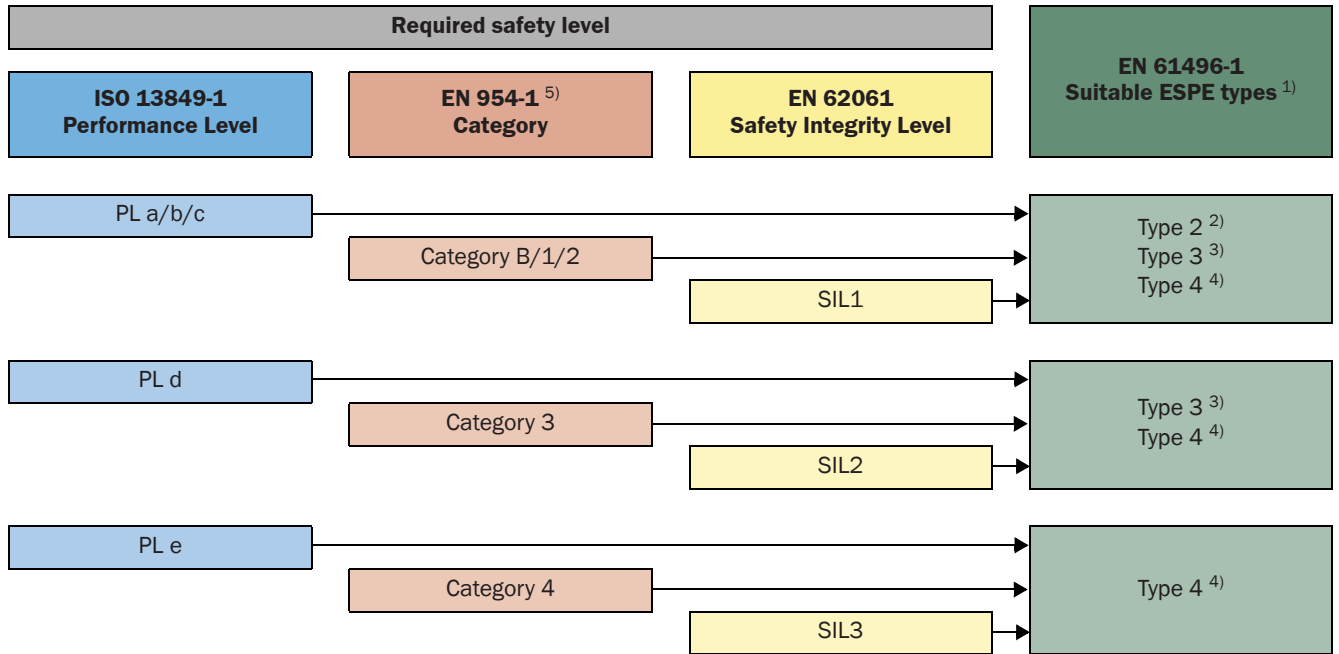
<sup>2)</sup> The following can occur:  
 - High frequency radio signals on the cables (e.g., transmitters in the vicinity)  
 - High voltage electrostatic discharges (ESD)  
 - Powerful electromagnetic fields (e.g., due to welding processes)

- Powerful burst/surge interference (e.g., due to electrical switching in the vicinity or systems in the vicinity that are poorly protected against lightning).

<sup>3)</sup> PFHd: Probability of dangerous failure per hour (see technical specifications).

### A 3. Recommended allocation PL/category/SIL to type

When in doubt, the following allocation is recommended:



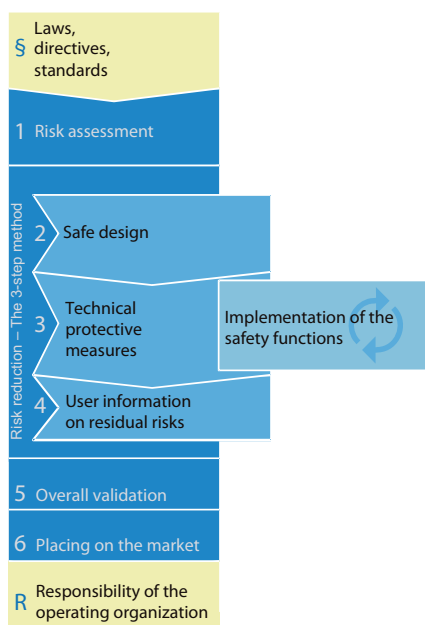
1) ESPE: Electro-sensitive protective equipment  
 2) Type 2: E.g., single-beam photoelectric safety switches, safety light curtains. For the necessary external tests and their demand rates see technical specifications.  
 3) Type 3: E.g., safety laser scanners, safety camera systems  
 4) Type 4: E.g., single-beam photoelectric safety switches, safety light curtains  
 5) Not suitable for electronic, programmable or complex protective measures. SICK recommends the application of EN ISO 13849-1.

The operating instructions for the opto-electronic protective devices contain further application information and instructions that must be taken into account.

## Six steps to a safe machine

Safe machinery provides legal security for the manufacturer and the operating organization. Since machine operators worldwide expect to be provided with safe machinery and devices, there are also regulations on the protection of users of machinery. Although these regulations are subject to regional variations, there is broad agreement on the process to be employed during the manufacture and upgrade of machinery:

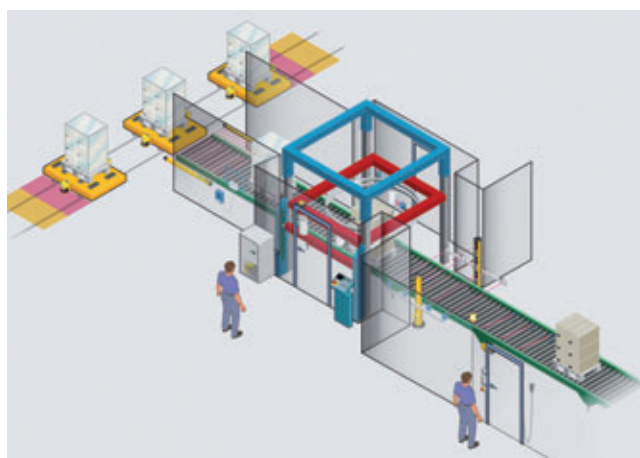
- During the manufacture of machinery, the machine manufacturer must identify and evaluate all possible hazards and hazardous points by performing a risk assessment (formerly called a hazard analysis).
- Depending on this risk assessment, the machine manufacturer should eliminate or reduce the risk by suitable measures. If the risk cannot be eliminated by design measures or the remaining risk cannot be tolerated, the machine manufacturer shall select and use suitable protective devices, and provide information on the residual risks, if necessary.
- To ensure the intended measures are effective, overall validation is necessary. This overall validation shall evaluate the design and technical measures, as well as the organizational measures in context.



We have bundled together our many years of practical experience and published our findings in the “Guidelines for Safe Machinery – Six steps to a safe machine.” With these steps we guide you to a safe machine.

You will find structured information on:

- legal requirements for machinery and their implementation
- safety-related directives, regulations and standards
- selection and application of protective devices
- examples on how to protect machines and people against accidents
- examples on the application of the new standards EN ISO 13849-1 and EN 62061 for the determination of the PL or the SIL



“Guidelines for Safe Machinery – Six steps to a safe machine” is available for download from [www.mysick.com](http://www.mysick.com) in the SICK documentation finder (publication type: competence brochure) or can be ordered as a printed brochure from your SICK contact. Part numbers for the European issue:  
 8008007 German  
 8007988 English  
 Part number for the North American issue:  
 7028282 English

# Services & Support

## International Service Solutions

B



### Safety you can trust

Increasing production targets and associated cycle rates require greater networking and automation. The result: production plants are becoming more complex and

operation more demanding. You have to be able to trust the safety of your production plants.

### Productivity in focus

Modern safety solutions offer the optimum combination of safety and efficiency: intelligently co-ordinated emergency stop strategies, zone concepts or muting functionalities optimize production work flow. Industrial safety technology increases machine availability and cuts downtime – we know your needs!

With services from SICK you benefit - throughout the entire life cycle of machines and plant - from the worldwide expertise of the market leader for safety systems and the experience it has gained in many industries and countless applications.

### Inspection services with DIN EN ISO/IEC 17020 quality



DAT-I-003/01

**SICK Safety Inspection**

#### Accreditation as an inspection body

DATEch has accredited SICK as an inspection body according to the IEC or EN ISO 17020 standard. Accreditation fulfils an important function in today's business climate: an independent authority confirms that the activities defined within the scope of accreditation are carried out with a high level of dependability and with the necessary quality.

The high level of training and qualifications of our staff as well as the structure of our processes and methods ensures the best level of service for our customers. Constant monitoring and process improvement, as well as adapting to our customers' needs, are an advantage for you.

An annual external inspection by independent experts ensures the quality of these services.

For customers this means:

- recognized verification methods
- a high level of competence and dependability
- objective inspection results
- independent confirmation
- international recognition

## Services at a glance

B

	Planning & Design	Commissioning	Operation	Upgrade	Page
<b>Consulting &amp; Design</b>					
Risk assessment	✓	-	✓	✓	B-2
Safety concept	✓	-	-	✓	B-3
Project management	✓	-	-	✓	B-4
Hardware design	✓	-	-	✓	B-5
Software design	✓	-	-	✓	B-6
Installation	-	✓	-	✓	B-7
Commissioning	-	✓	-	✓	B-8
Functional safety assessment	✓	-	✓	✓	B-9
CE-conformance check	✓	-	-	✓	B-10
CE certification	✓	-	-	✓	B-11
Plant walk-through	-	-	✓	-	B-12
<b>Verification &amp; Optimization</b>					
Initial inspection	-	✓	-	✓	B-13
Periodic inspection	-	-	✓	-	B-15
Machine safety inspection	-	✓	✓	✓	B-18
Electrical equipment check	-	✓	✓	✓	B-19
Accident investigation	-	-	✓	-	B-20
Stoptime measurement	-	✓	✓	✓	B-21
Noise measurement	-	-	✓	-	B-23
<b>Training &amp; Education</b>					
Seminars	✓	-	✓	✓	B-24
User training	✓	✓	✓	✓	B-25
WebTraining	✓	-	✓	✓	B-27
<b>Upgrade &amp; Retrofits</b>					
Upgrade kits	-	-	-	✓	B-28
<b>Product &amp; System Support</b>					
Commissioning check	-	✓	-	✓	B-29
Helpline support	-	✓	✓	✓	www.sick.com
On-site troubleshooting	-	✓	✓	✓	www.sick.com
Exchange units	-	-	✓	-	www.sick.com
Spare parts	-	-	✓	✓	www.sick.com
Workshop repairs	-	-	✓	-	www.sick.com

→ Please contact your local subsidiary or agent to find out more about the services offered in your country or select your contact at [www.sick.com](http://www.sick.com).



**B**

- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

## A systematic approach to minimizing risks on machines and technical equipment



### Scope of services

Preparation of a documented risk assessment using Safexpert (in accordance with EN ISO 12100 and ISO 14121), which includes:

- A list of all safety requirements to ensure machine safety
- Analysis and evaluation of the hazards and risks related to the machine
- Evaluation and categorization of all safety-related parts of the control system (category/SIL/PL)
- Proposed solutions to obtain the necessary risk reduction

### Advantages at a glance

- Time and cost savings by involving SICK experts at an early stage
- Compliance with directives and laws is planned as an integral part of a project
- Potential weak spots are identified at an early stage
- Necessary measures are implemented during an early project phase
- Avoidance of over-sizing
- Assurance of efficiency and competitiveness

### Note

Please ask your SICK representative which service is available in your country.

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## A safety concept taking standards and directives into account



**B**



- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

### Scope of services

Development of the necessary solutions for risk reduction in a concept document, which includes:

- Proposals on how to achieve compliance with essential safety requirements and international standards
- Functional description of the overall concept, including safety areas
- Layout including location of the safety-related equipment
- Functional safety assessment on safety related parts of the control system, based on a risk analysis and user information
- Dimensioning of the mechanical guarding including heights, safety distances, maximum openings
- Specification of the safety requirements including switch-off matrix, category, PL, SIL, stop category
- Basis for the preparation of hardware and software concepts

### Advantages at a glance

- Increase in machine safety: Compliance with the essential health and safety requirements and international standards
- Flexibility - product-neutral concept design
- Overcompliance can be avoided, which ensures effectiveness and commercial competitiveness

### Note

Please ask your SICK representative which service is available in your country.

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## B

- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

## Professional planning and control of your projects right from the start



### Scope of services

Effective project management includes:

- Preparation of contractual specifications
- Monitoring project progress while taking into account the schedule
- Supplier management
- Organizing of the activities on the customer's premises during installation and commissioning

### Advantages at a glance

- Time and cost savings. By involving SICK experts at an early phase, compliance with the directives and laws can be planned as an integral part of a project.
- Potential weakspots are identified early so that the necessary measures can be implemented during an early project phase.
- Everything from a single source!

### Note

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## Conceptional design of safety-related control circuits and selection of suitable components


**B**


- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

### Scope of services

Hardware planning using CAD in accordance both with the specification and also with relevant regulations and directives, including

- Technical clarification
- Selection of suitable components
- Preparation of circuit diagrams
- Terminal diagrams
- Layout diagrams (control cabinet)
- Parts lists
- Documentation in electronic format

### Advantages at a glance

- Cost savings due to more efficient project implementation
- Optimal matching of different technologies

### Note

Please ask your SICK representative which service is available in your country.

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## B

- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

## High-quality and reliable programming of safety-related control circuits



### Scope of services

- Preparation of the software program or configuration based on the existing safety concept
- Preparation of the data exchange with other communication modules
- The range of services includes technical clarification, preparation of a user document, system specification, software check, comments, allocation table, cross-reference list, final review and documentation in electronic format
- From the planning phase to commissioning of the customer-specific hardware and software, all work is performed in accordance with strict configuration guidelines. Each phase is clearly described. Projects are implemented based on the V-model

### Advantages at a glance

- Protection of workers and machines in compliance with standards and regulations
- Cost savings: Efficient project implementation minimizes the risk of productivity restrictions

### Note

Please ask your SICK representative which service is available in your country.

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## Pre-assembly of components and equipment



**B**



- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

### Scope of services

Installation in accordance with specifications, including

- Complete wiring of all AOPDs, proximity switches, valves, motors, emergency switching off/emergency stop push-buttons and mechanical interlocking devices, etc.
- Layout of all connection cables (cabinet-terminal box)
- Wiring test

### Advantages at a glance

- Cost savings: Minimizing of the risk of productivity restrictions
- Time savings: Reduction in employee pressure and fast project implementation

### Note

Please ask your SICK representative which service is available in your country.

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**B**

- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

## Commissioning safety-related control circuits with subsequent commissioning check



### Scope of services

Commissioning of all safety-related machine functions in accordance with the specification including

- AOPD configuration and adaption of the protective and warning fields

- Interface communication
- Proximity switches, valves, drives, emergency switching off/emergency stop and mechanical interlocks, etc.
- Final safety inspection

### Advantages at a glance

- Protection of workers and machines ensured by means of compliance with standards and regulations
- Cost savings: Minimizing of the risk of productivity restrictions
- Time savings: Reduction in employee pressure
- Avoidance of safety flaws and proof of due diligence by using a second set of eyes

### Note

Please ask your SICK representative which service is available in your country.

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## SIL and PL: new demands from new standards



**B**



- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

### Scope of services

Validation of the safety-related parts of the control system in relation to the requirements on the safety functions and on the safety integrity, which includes:

- Check the software concept
- Check the hardware concept
- Mismatches between expected and actual results (SIL, Performance Level or category)
- Installation and commissioning check on-site (option)

### Advantages at a glance

- Avoidance of over-sizing - effectiveness and competitiveness safeguarded
- Cost savings: efficient use of expert knowledge
- Avoidance of safety flaws and proof of due diligence by using a second set of eyes

### Note

Please ask your SICK representative which service is available in your country.

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## B

- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

## We guide you through the worldwide "jungle" of standards



### Scope of services

- CE on-site review on the machine
- Check the essential hazards in relation to the manufacturer's risk assessment
- Check all electrical, pneumatic, hydraulic safety-related control equipment
- Check essential health and safety requirements
- Check the documentation
- Check the complete machine documentation (design documentation, risk analysis, etc.)
- Certificate of conformity

### Advantages at a glance

- Independent CE-conformance check to prevent liability risks
- Cost savings: efficient use of expert knowledge

### Note

Please ask your SICK representative which service is available in your country.

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## "Safety" as an integral part of the buying process



**B**



- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

### Scope of services

Co-ordination and implementation of all necessary activities to safeguard the requirements for CE marking

- Preparation of a risk assessment in accordance with EN ISO 12100 and ISO 14121
- Preparation of a safety concept (or: assessment of a proposal)

- Check the documentation on individual sub-systems
- Compilation of the technical design documentation
- CE-conformance check
- Preparation of the declaration of conformity

### Advantages at a glance

- Increase in machine safety; compliance with the EHSRS and EN standards
- Risk reduction - SICK acts as a "supervisor" in the context of the Machinery Directive
- Time and cost savings: By involving SICK experts at an early phase, compliance with the directives and laws can be planned as an integral part of a project.
- Avoidance of over-sizing - effectiveness and competitiveness safeguarded

### Note

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## B

- Time savings - early recognition of potential weak points
- Cost savings - efficient use of expert knowledge
- Assurance of efficiency and competitiveness

## A contribution to your company's safety culture



### Scope of services

- Appraisal of the safety-related status of all equipment in a manufacturing plant in relation to the development of an appropriate safety strategy
- Analysis of the current compliance status of the systems based on general data, technical data and safety data

### Advantages at a glance

- Quick scan to determine the current safety status of the machinery
- Identification of the most important safety aspects
- Assistance with the organization of the future approach in relation to safety
- Conformity with legal and official obligations and responsibilities of the operating organization
- Planning tools for collaboration with health and safety authorities

### Note

Please ask your SICK representative which service is available in your country.

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## Decades of experience to protect your employees



B

- Comply with current safety standards
- Reduce responsibility
- Maintain safety levels, availability and ongoing production



### Scope of services

- Compliance with applicable safety standards and regulations
- Determination of the health and safety aspects of the protective device for the protection of mechanical hazards on machinery and systems
- Determination of the correct installation and function of the device
- Check on the effectiveness of the protective device according to the current usage of the machine
- Integration of the protective device in the control system down to signal transfer in accordance with the required category as per safety standards
- Correct interaction with the combined protective devices
- Introduction to SICK device functions for the operator

### Advantages at a glance

- Assurance of safety and component availability
- Supplement to the machine documentation in relation to compliance with machine safety by means of a safety report
- Quick identification of the safety status of the machine by the means of the SICK inspection seal
- High-quality inspection by an accredited inspection body in accordance with DIN EN ISO/IEC 17020 (DAT-I-003/01)
- Quick familiarity with SICK protective devices

### Main test areas

- Does the SICK safety device function in line with the current use of the machine?
- Does the type of SICK safety device correspond with the hazards actually encountered?
- Does the SICK safety device correspond with the type required according to IEC 61496?
- Does integration of the SICK safety device, up to output signal transfer to the control system, correspond with the category complying with international safety standards?
- Is it impossible to bypass the SICK safety device?

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## Test documentation

- The SICK test seal will be attached if the test is successful.
- A test report supplements your machine documentation regarding compliance with machine safety requirements.

B



Safety seal for presses



Safety seal for power-driven machinery

## Preconditions

- The devices are assembled, ready for operation and accessible.
- The machine documentation must be available as it is part of the inspection.
- The machine operator must be available for the duration of the measurement, to set up system-specific operations and to start the system.
- The machine stoptime is required in order to determine the safety distance for the protective device. This can be made available in written form. Alternatively, we can offer "stoptime measurement" as a separate service.
  - stoptime measurement page B21

## Note

Please ask your SICK representative which service is available in your country.

## Ordering information

Inspection for device type <sup>2)</sup>	Part number
WSU/WEU/26	on request
VS/VE18	1681984
M2000	1681321
M4000	1682310
M4000 with UE403	1682311
C2000 (Host)	1681319
C2000 (Guest)	1681980
S200	on request
S3000 Standard	1681880
S3000 Advanced	on request
S3000 Professional	on request
S3000 Remote	on request
S300 Standard	1682371
S300 Advanced	on request
S300 Professional	on request
C4000 (Host)	1681613
C4000 (Guest)	1681614
V300	on request
V4000	1682312
Equipment from other suppliers (AOPD, AOPDDR)	1681944 <sup>1)</sup>

<sup>1)</sup> Device types as per prior agreement

<sup>2)</sup> Additional device types on request

The above-mentioned details for placing orders relate to invoice pricing based on lump sum charges. Information on prices and price breakdowns are given in the current price list.

## Decades of experience to protect your employees



B

- Comply with current safety standards
- Reduce responsibility
- Maintain safety levels, availability and ongoing production



### Scope of services

- Compliance with applicable safety standards and regulations
- Determination of the health and safety aspects of the protective device for the protection of mechanical hazards on machinery and systems
- Determination of the correct installation and function of the device
- Check on the effectiveness of the protective device according to the current usage of the machine
- Integration of the protective device in the control system down to signal transfer in accordance with the required category as per safety standards
- Correct interaction with the combined protective devices
- Introduction to SICK device functions for the operator

### Advantages at a glance

- Assurance of safety and component availability
- Supplement to the machine documentation in relation to compliance with machine safety by means of a safety report
- Quick identification of the safety status of the machine by the means of the SICK inspection seal
- High-quality inspection by an accredited inspection body in accordance with DIN EN ISO/IEC 17020 (DAT-I-003/01)
- Quick familiarity with SICK protective devices

### Main test areas

- Does the SICK safety device function in line with the current use of the machine?
- Does the type of SICK safety device correspond with the hazards actually encountered?
- Does the SICK safety device correspond with the type required according to IEC 61496?
- Does integration of the SICK safety device, up to output signal transfer to the control system, correspond with the category complying with international safety standards?
- Is it impossible to bypass the SICK safety device?

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### Test documentation

- The SICK test seal will be attached if the test is successful.
- A test report supplements your machine documentation regarding compliance with machine safety requirements.

B



Inspection seal for presses



Inspection seal for power-driven machinery

### Preconditions

- The devices are assembled, ready for operation and accessible.
- The machine documentation must be available as it is part of the inspection.
- The machine operator must be available for the duration of the measurement, to set up system-specific operations and to start the system.
- The machine stoptime is required in order to determine the safety distance for the protective device. This can be made available in written form. Alternatively, we can offer "stoptime measurement" as a separate service.
  - stoptime measurement page B21

### Periodic inspection with a service contract



Unforeseen events can be reduced to a minimum by regular safety inspections following prior arrangement with you. Inspections can be performed for an entire production site, if desired.

Take advantage of the following additional benefits:

- Less organizational effort through agreed upon appointments and monitoring of the inspections
- Benefit of scheduled machine downtimes for the measurements and inspections
- Priority aid in case of faults

We would be happy to discuss the options available for your production site.

### Note

Please ask your SICK representative which service is available in your country.

## Ordering information

Inspection for device type <sup>2)</sup>	Part number
WSU/WEU/26	on request
VS/VE18	1681985
LGS	1690048
MSL, MSLZ	1681041
M2000	1681313
M4000	1682313
M4000 mit UE403	1682314
FGS	1681021
C2000 (Host)	1681311
C2000 (Guest)	1682101
PLS	1681023
S200	on request
S3000 Standard	1681882
S3000 Advanced	on request
S3000 Professional	on request
S3000 Remote	on request
S300 Standard	1682370
S300 Advanced	on request
S300 Professional	on request
C4000 (Host)	1681624
C4000 (Guest)	1681625
V300	on request
V4000	1682315
Equipment from other suppliers (AOPD, AOPDDR)	1681945 <sup>1)</sup>

<sup>1)</sup> Device types as per prior agreement

<sup>2)</sup> Additional device types on request

The above-mentioned details for placing orders relate to invoice pricing based on lump sum charges. Information on prices and price breakdowns are given in the current price list.



## B

- Comply with current safety standards
- Reduce responsibility
- Maintain safety levels, availability and ongoing production



## The individual safety check - determine the safety status of your machines and plant



### Scope of services

Safety inspection that includes:

- Check all guards are aligned properly
- Disconnection of hydraulic and pneumatic energy sources to check expected response
- Function check on all guards, emergency stop/emergency switching off and other safety features
- Check whether all dangerous movements are stopped as required
- Check the correct installation and function of the AOPD
- Check the effectiveness of the protective device according to the current usage of the machine
- Correct interaction with combined protective devices

### Advantages at a glance

- Quick overview to determine the safety status of the machine
- Basis for compliance with the requirements as per directives on work equipment
- Monitoring inspection cycles as part of service contracts
- High-quality inspection by an accredited inspection body in accordance with DIN EN ISO/IEC 17020 (DAT-I-003/01)

### Note

Please ask your SICK representative which service is available in your country.

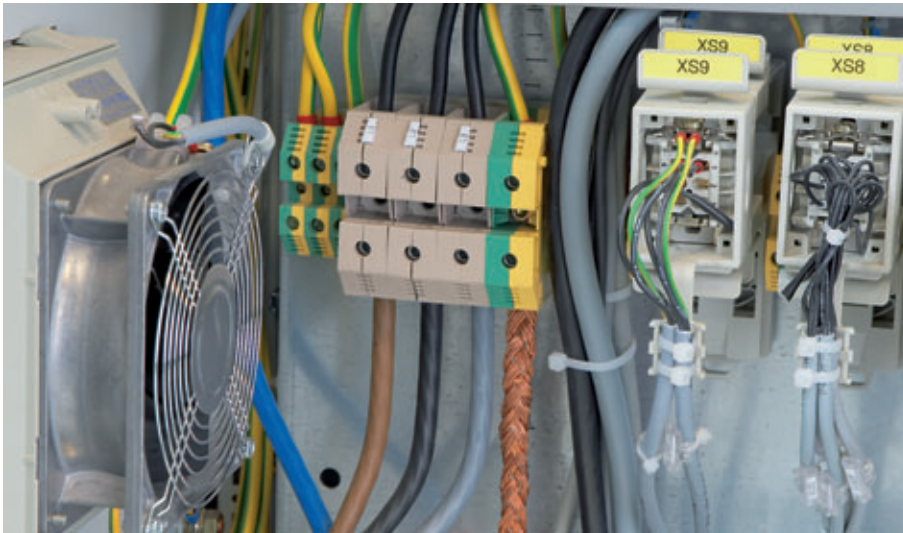
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## "The invisible hazard" - inspection to protect against electrical risks



B



- Comply with current safety standards
- Reduce responsibility
- Maintain safety levels, availability and ongoing production



### Scope of services

Determination of correct function of the protective bonding circuit as per the requirements of IEC 60204-1.

- Confirmation of minimum cross-section and designation of protective conductors
- Protection against direct contact
- Protection against residual voltages of active components
- Confirmation of the connections of the protective bonding circuit

- Compliance with the required limits for insulation resistances/residual currents
- Voltage test
- Determination whether the transfer resistances exceed the permitted tolerance band
- Measuring method without complex interruption of existing cables

### Advantages at a glance

- Guaranteed quality of the measurement through approved measuring devices and reproducible documentation
- Preparation of a measurement report for machine documentation
- Identify hazards due to electric shock early on
- Increased safety, availability and productivity
- High-quality inspection by an accredited inspection body in accordance with DIN EN ISO/IEC 17020 (DAT-I-003/01)
- Compliance with the applicable safety standards

### Note

Please ask your SICK representative which service is available in your country.

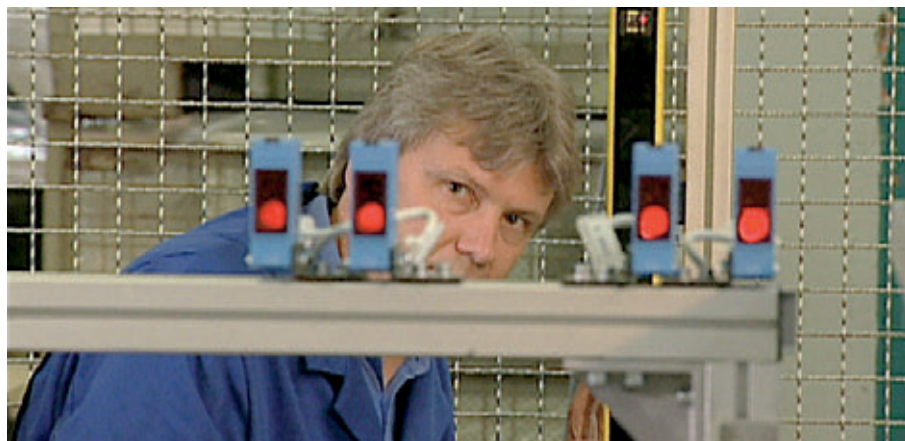
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B

- Comply with current safety standards
- Reduce responsibility
- Maintain safety levels, availability and ongoing production

## Cause analyses for accidents and incidents



### Scope of services

#### A. Basic check

- Assessment of the equipment to be checked
- Determination of the primary cause of the accident and underlying aspects that triggered the accident
- Analysis of the equipment, drawings, operation and safety-related control measures; Proposals for solutions to prevent a repetition of the event

#### B. Additional detail check

- Detailed analysis of the equipment to be checked
- Implementation of a safety inspection to determine the exact cause of the accident
- Complete risk assessment, based on an evaluation of the hazards
- Final document on the investigative file

### Advantages at a glance

- Independent review of an incident/accident at a machine
- Assurance that the cause of an accident/incident is completely checked and measures are initiated to prevent a repetition of the event

### Note

Please ask your SICK representative which service is available in your country.

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## Accredited methods ensure high quality and reproducible results



B



- Comply with current safety standards
- Reduce responsibility
- Maintain safety levels, availability and ongoing production



### Scope of services

- Measurements of ten typical dangerous movements on a machine and determination of the current stopping/run-down time
- Calculation of the correct safety distance from the hazard point to the protective device in accordance with the principles in the type C standard or international standards

### Advantages at a glance

- Ensured quality of the measurement through approved measuring devices and reproducible documentation
- Attachment of a label with the key data directly to the machine
- Preparation of a measurement report for the machine documentation
- High-quality inspection by an accredited inspection body in accordance with DIN EN ISO/IEC 17020 (DAT-I-003/01)
- Definition of dangerous risks

### Documentation

- A measurement report will be provided for your machine documentation.
- A label with the measurement data is attached directly to the machine.

<b>SICK</b>	
Measurement	on <input type="text"/>
No. <input type="text"/>	Pos. <input type="text"/>
Stoptime	<input type="text"/> ms
Safety distance	<input type="text"/> mm

Further information	Page
→ Ordering information	B-22
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Preconditions

- The power-driven machinery or press must be equipped with the workpiece/tool for the intended use.
- The system or machine must be freely accessible for the measurement.

**B**

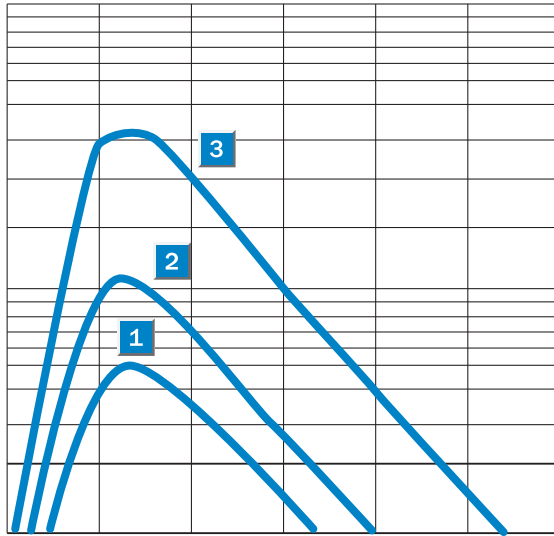
Note

Please ask your SICK representative which service is available in your country.

Ordering information

Service	Remark	Part number
Stoptime measurement	For each dangerous movement of the machine	1681946

## The new directive for noise exposure - increased requirements for the user



### Scope of services

- Machine noise survey in relation to the requirements of the Machinery Directive
- Determination of the A-weighted equivalent continuous pressure level at the workplaces
- Determination of the peak of the instantaneous C-weighted sound pressure at the workplaces
- Measurement in accordance with the relevant standards such as EN ISO 3746, EN ISO 11202

### Advantages at a glance

- Independent measurements undertaken by a third party to avoid consequential costs in the event of failure to comply with directives
- Assurance of compliance with the requirements of standards and regulations

### Note

Please ask your SICK representative which service is available in your country.



# B

- Comply with current safety standards
- Reduce responsibility
- Maintain safety levels, availability and ongoing production

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**B**

- Train employees
- Strengthen investment decisions
- Gain a competitive advantage

## Expertise - practical and competent



### Scope of services

- Essential information on relevant regulations regarding machine safety
- Standard-orientated selection of suitable safety devices, integration of safety equipment in the general control system
- Correct assessment of safety procedures based upon currently applicable directives, standards and legislation/regulations
- Target group-oriented courses
- High qualified trainers and external speakers
- Structured and participant-oriented training documents

### Advantages at a glance

- Confidence in decision-making through clarity of relevant rules, regulations and application specifications
- Increased levels of competence through ongoing staff training
- Keeping technology in focus so that the right investment decisions are made in the future

### Note

Please ask your SICK representative which service is available in your country.

## Ordering information

If required, we can conduct our seminars and user training programmes on your premises.

Service	Part number
Principles of machine-related safety	1681692
Function, selection and application of safety devices	1681694
Safe electrical and pneumatic control technology for constructors	1682324
CE marking	1682111
Hazard analysis and risk assessment	1681913
New standards for safe machines EN ISO 13849-1 and EN IEC 62061	1681695

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## Practical product training for your success


**B**


- Train employees
- Strengthen investment decisions
- Gain a competitive advantage

### Scope of services

- Customer-specific or standard training programs, on-site or at SICK location
- Basic and advanced courses, product instructions as crash course
- Highly qualified trainers in technology and education
- Structured and participant-oriented training documents
- Methodical and didactical prepared training equipment for practical hands-on training supports the learning transfer

### Advantages at a glance

- Being "fit": Know what to do in an emergency, and thus reducing machine downtime
- Increased levels of competence through ongoing staff training
- Keeping technology in focus so that the right investment decisions are made in the future

### Note

Please ask your SICK representative which service is available in your country.

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→ Ordering information	B-26
→ Consulting & Design	B-2
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## Ordering information

If required, we can conduct our seminars and user training programs at your site.

**B**

Service	Part number
C4000 safety light curtain – basic training	1681681
Advanced functions of the C4000 with UE402 safety interface – advanced training	1681683
C4000 Entry/Exit and C4000 Palletizer – advanced training	1682399
M4000 multiple light beam safety device – basic training	1682325
Muting applications with M4000 and interface UE403 – advanced training	1682327
MSL multi-beam photoelectric safety switch with MSM muting expansion module	1681357
S3000 safety laser scanner – basic training	1681916
S3000 safety laser scanner – mobile applications	1681917
S300 safety laser scanner – basic training	1682390
Product instruction on S3000 laser scanners	1681919
Product instruction on S300 laser scanners	1682392
Product instruction on PLS laser scanners	1681680
PLS proximity laser scanner	1681359
LSI laser scanner interface	1681361
V4000 camera system – integration training	1682329
Modular safety controllers – Flexi Classic and Flexi Soft	1682394
Interface UE440/UE470 – multifunctional safety controllers	1681923
Interface UE4100 – bus node for PROFIsafe	1681691
Safe networking and automation of AS-interface with the UE4200 series	1682393
SICK safety network solutions with UE44xx	1681924
Safexpert® training	1681365



## Training from the comfort of your office



**B**

- Train employees
- Strengthen investment decisions
- Gain a competitive advantage

### Scope of services

- Comprehensive information via Internet
- Learning in the office without any travel time
- Live discussion via telephone/voice over IP
- Live training at defined times or available anytime as download
- Internet offering and -schedule always available

### Advantages at a glance

- Gain knowledge in a short period of time
- Usable directly at the workplace
- No travel delay
- Discussion with experts
- Available worldwide
- Low costs

### Note

Please ask your SICK representative which service is available in your country.

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## B

- Assurance of machine availability into the future
- Increased availability of spare parts
- Prevention of costly and unplanned plant downtime

## Individually tailored replacement packages for "old" protective equipment



### Scope of services

- Tailor-made upgrade kits for older and phased out protective devices
- Replacement of older and phased out protective devices with higher functionality
- Efficient assembly and installation
- Safety inspection possible

### Advantages at a glance

- Ensure availability of machines in the future
- Secure spare part availability
- High functionality by using innovative technology
- Optimize productivity
- Avoid costly and unplanned machine downtime

### Note

Please ask your SICK representative which service is available in your country.

### Ordering information

Model name	Replacement for	Items supplied	Part number
PLS/S3000 upgrade kit	PLS 10x-x12	S30A-4011BA System plug Configuration connection cable	1042553 <sup>1)</sup>
PLS/S3000 upgrade kit	PLS 101-316 PLS 20x-x13 (on request)	S30A-7011BA System plug Configuration connection cable	1047224 <sup>1)</sup>
LCUR-1 upgrade kit	LVU, LVS, AGS	C4000 Standard or Advanced LCUR1-411 Mounting brackets Connection cables Configuration connection cable	on request

<sup>1)</sup> The kit cannot be used as PLS upgrade, if the PLS was used in combination with LSI. The offer is valid only in case of redelivery to SICK of one PLS for each PLS/S3000 upgrade kit.

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→ Consulting & Design	B-2
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## Qualified inspection of correct function and proper installation


**B**


- Greater plant availability through dependable reaction times
- Worldwide service network ensures short-term activity planning
- Rapid, competent local support

### Scope of services

- Determination of the correct installation and function of SICK protective devices
  - Introduction for the operator to the functions of the SICK protective device
- Detailed checks on the
- Mechanical and electrical installation
  - Configuration and adaptation of protective and warning fields
  - Selection of the operating mode (blanking, restart interlock, automatic operation)
  - Interface communication
  - Outputs
  - Correct cabling

### Advantages at a glance

- Early assurance of availability from the start
- Assurance of the correct technical function of the SICK protective device
- Rapid familiarity with SICK protective devices

### Note

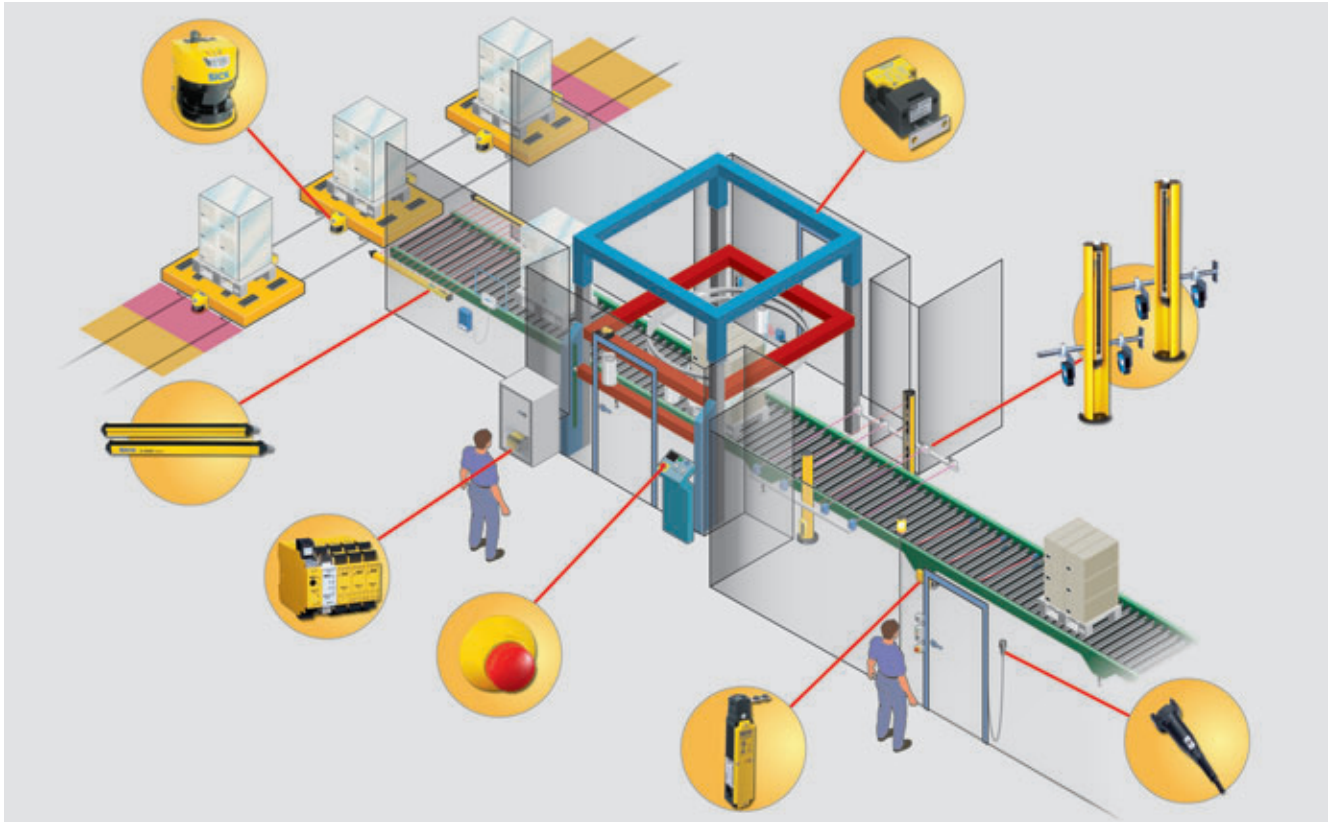
Please ask your SICK representative which service is available in your country.

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# Applications

Products and complete solutions for effective operator protection, accident protection and collision prevention

C



## Solutions from SICK – we always have an eye on the big picture!

Today, standards and regulations often require the use of safety technology. Our goal is to create a solution that does not interfere with the production process, but rather optimizes it –

whether it is an individual solution or an integrated safety concept with high diagnostic capabilities.

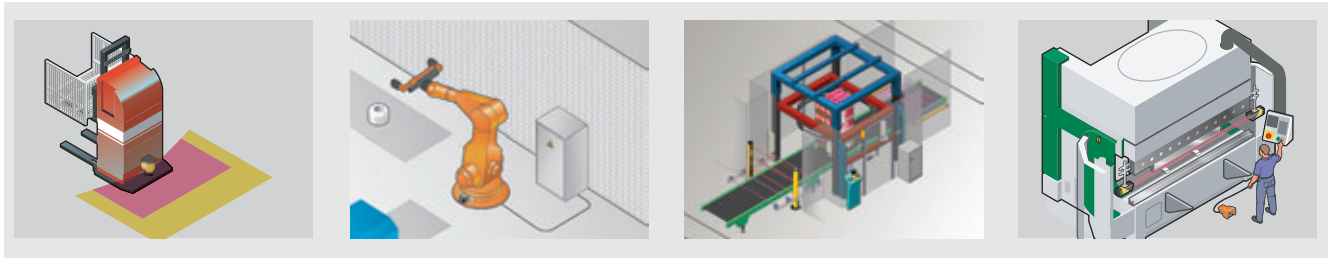
## Think about tomorrow, today!

SICK stands for expertise gained in the field. Our knowledge of many machines and systems enables customized solutions that will also satisfy your future requirements!

mounting must be adapted to the specific application and site requirements.

The examples shown on the following pages illustrate application solutions. Device selection, integration and

Talk to us. We are happy to share our expertise and be of service.



## Applications at a glance

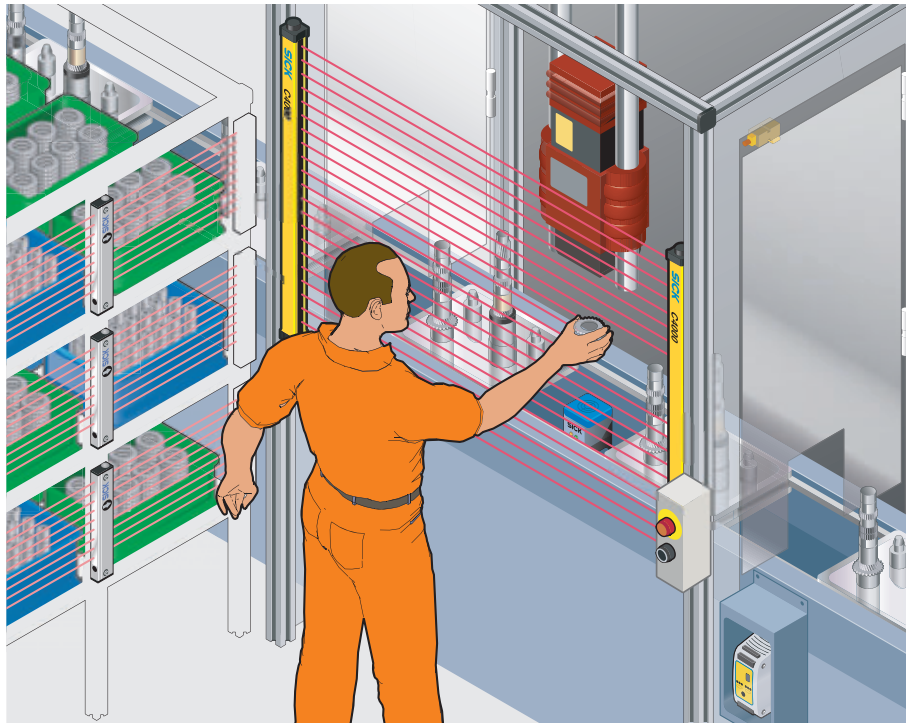
Task	Description	Industrial sector	Product family	Page
Hazardous point protection	Hazardous point protection on a press for an automobile supplier	Automotive and other vehicles	C4000, Flexi Soft, T4000 Direct, ES21	C-3
	Monitoring of a lateral chain conveyor in a sawmill	Wood	C4000 Fusion, Flexi Classic	C-4
	Protection of the handling area on a solar cell classification machine	Electronics, (electrical) precision engineering, optics	miniTwin, Flexi Classic, ES21, i14 Lock, i12S, RE13	C-5
	U-shaped hazardous point protection to improve ergonomics	Automotive and other vehicles	miniTwin, Flexi Classic	C-6
	Protection of a labelling machine	Packaging, pharmaceutical / medical, food & beverage	C2000, Flexi Classic, ES21	C-7
	Hazardous point protection on a semi-automatic assembly station	Assembly, handling, robotics, automation	V300 Work Station Extended, Flexi Classic	C-8
	Protection of the sliding door on an automatic placement machine	Automotive and other vehicles, electronics, (electrical) precision engineering, optics	i14 Lock, Flexi Classic	C-9
	Door and fall-through protection on a sealing, cutting and labelling unit in the meat processing industry	Food & beverage, packaging	C2000 Micro in IP69K, ES21, i16S, Flexi Classic	C-10
Hazardous area protection	Hazardous area protection on a traversing bogie	Storage and conveyor technology	S3000	C-11
	Protecting an automated guided vehicle with two protecting cases	Storage and conveyor technology, transport, traffic, logistics	S300	C-12
	Hazardous area protection on a rotary table	Machine tool, automotive and other vehicles	S300, Flexi Classic, ES21	C-13
	Hazardous area protection and collision prevention on overhead conveyors	Transport, traffic, logistics, storage and conveyor technology	S300	C-14
	Mobile hazardous area protection on a pick-up transport vehicle	Automotive and other vehicles, storage and conveyor technology	S300	C-15

Continued on next page

C

Task	Description	Industrial sector	Product family	Page
Hazardous area protection, access protection	Hazardous area and access protection on a robot cell	Assembly, handling, robotics, automation	S3000, Flexi Soft, ES21	C-16
Access protection	Access protection on a transfer route with differentiation between man and material	Automotive and other vehicles	C4000 Fusion, Flexi Classic	C-18
	Access protection without muting with automatic detection of goods	Storage and conveyor technology, packaging	C4000 Palletizer Standard, ES21, Flexi Classic	C-19
	Protecting the loading and unloading station of a machining center	Machine tool	C4000, ES21, Flexi Soft, M4000	C-21
	Multiple protection of a robot cell	Automotive and other vehicles	C4000, ES21, IN4000, S300, UE4470, UE4457	C-22
	Access protection with different safety sensors	Automotive and other vehicles	ES21, L4000, M4000, Flexi Soft, WSU/WEU26-3	C-23
	Protection of the flaps on a milling machine	Food & beverage	T4000, ES21, Flexi Classic	C-24
	Safe functions in manufacturing – Material removal point in a rack station	Machine tool	UE4457, C4000, IN4000, ES21, M4000	C-25
Safety automation, access protection	Coordination of various safety sensors on a forklift truck test bench	Storage and conveyor technology	ES21, Flexi Soft, M4000	C-27
Collision prevention	Bay monitoring and collision prevention using high-bay stackers	Storage and conveyor technology	S100 Standard	C-29
	Collision prevention and hazardous area protection on automated guided vehicle	Storage and conveyor technology, transport, traffic, logistics	S100 Standard, S300 Professional	C-30
	Rear space monitoring on a forklift truck	Storage and conveyor technology, transport, traffic, logistics	S100 Standard	C-31
<b>Overview for access protection with differentiation between man and material</b>				<b>C-32</b>

# Hazardous point protection on a press for an automobile supplier



C

- SICK is continually publishing examples of application solutions on the Internet ([→ www.sick.com](http://www.sick.com)).
- The "Application Finder" will help you find additional solutions.

## Application overview

Task	Hazardous point protection
Industrial sector	Automotive and other vehicles
Application location/machine type	Presses
Product family	C4000 Eco, Flexi Soft, T4000 Direct, ES21
Type of controller	Flexi Soft

## Application in detail

### Task

Workers need to reach into a press, which presses gear wheels onto gear axles in order to fit the gear wheel on the axle. The press must therefore be stopped when they reach inside.

### Solution

The hazardous point is protected with a C4000 safety light curtain combined with a modular Flexi Soft safety controller. The gear axles are automatically fed into the press on carriers. An IQ40 inductive proximity sensor detects the carrier and triggers a stop signal for the transport system and a signal for exact positioning. The press works in a single break mode – the worker fits the gear wheel onto the axle. When doing this, he breaks the protective field of the light curtain. As soon as he

leaves the field, the machine cycle is automatically started.

The two doors to the carrier inlet and outlet are protected with T4000 Direct transponder safety switches. Opening one of the doors triggers a stop command for the dangerous movement of the press. All press control signals, such as top dead center (TDC), bottom dead center (BDC) and over-travel monitoring, as well as the door protection signals and the ES21 emergency stop pushbutton, are evaluated by the Flexi Soft safety controller. A reset button is required to initially start the machine, to reset the restart interlock if the protective field is broken during a dangerous movement or the monitoring time of 30 s has been exceeded.

### Customer benefits

- Reliable protection for workers
- Minimal press downtime

Further information	Page
<a href="#">→ C4000 Eco</a>	F-168
<a href="#">→ Flexi Soft</a>	O-25
<a href="#">→ T4000 Direct</a>	L-42
<a href="#">→ ES21</a>	M-2
<a href="#">→ Services</a>	B-0

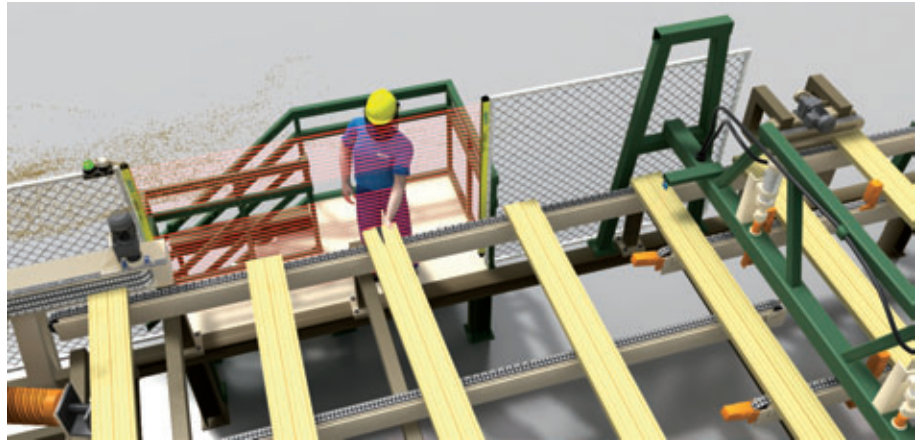


C

Application  Finder

- SICK is continually publishing examples of application solutions on the Internet (→ [www.sick.com](http://www.sick.com)).
- The "Application Finder" will help you find additional solutions.

## Monitoring of a lateral chain conveyor in a sawmill



### Application overview

Task	Hazardous point protection
Industrial sector	Wood
Application location/machine type	Sawmill
Product family	C4000 Fusion, Flexi Classic
Type of controller	Flexi Classic

### Application in detail

#### Task

In a sawmill, lumber is transported away from the sawing line on a conveyor system with a sequence of lateral chain conveyors. Because the sawn planks can slide over one another during transportation and those with various defects have to be turned and positioned, they need to be separated and/or aligned by employees at certain points. To do this, the person has to reach directly into the hazardous area of the conveyor system. This requires electro-sensitive protective equipment, which allows access but reliably detects entry into the hazardous area and shuts down the lateral chain conveyor.

#### Solution

With the C4000 Fusion, a solution has been found that reliably detects access to the conveyor system but enables an employee to intervene as required for the process without the transport system being stopped. To achieve this, a reduced resolu-

tion of 240 mm has been specified – this corresponds to the clothed arm of the machine operator or a multiple of the thickness of a plank, so that the plank can also be removed through the active protective field if required without stopping the conveyor system. The multiscan function uses an increase in the scanning rate and intelligent evaluation of the scanning results to enable differentiation of an arm and a wood chip. This ensures reliable and safe monitoring of the chain beds despite the large amount of dust produced in the cutting process.

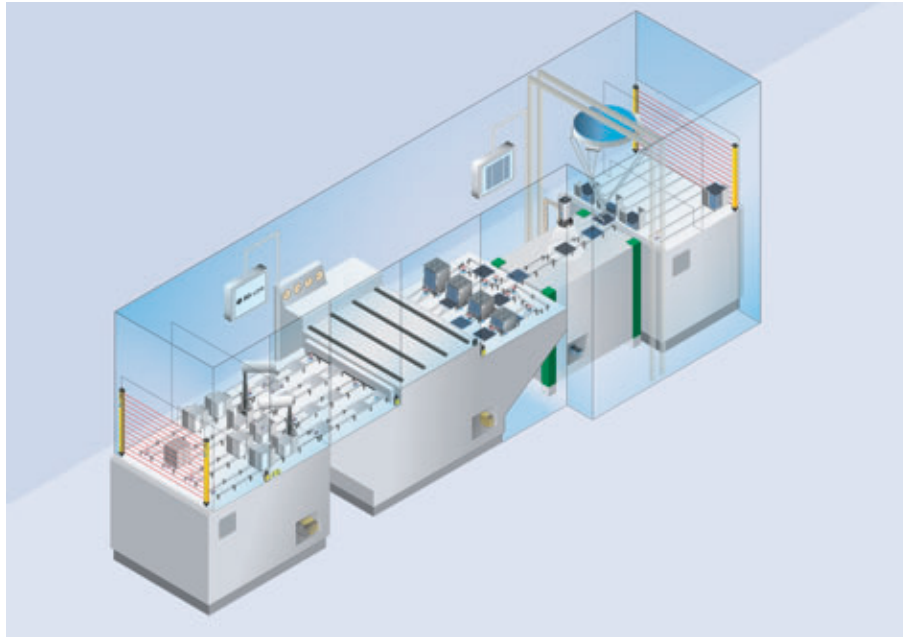
#### Customer benefits

The C4000 Fusion is an EN 61496 type 4 and IEC 61508 SIL3 compliant protective device for sawmills and for wood working and processing plants that is largely independent of its surroundings, guaranteeing both maximum safety and optimum availability.

Further information	Page
→ C4000 Fusion	F-205
→ Flexi Classic	O-2
→ Services	B-0



## Protection of the handling area on a solar cell classification machine



C

- SICK is continually publishing examples of application solutions on the Internet (→ [www.sick.com](http://www.sick.com)).
- The "Application Finder" will help you find additional solutions.

### Application overview

<b>Task</b>	Hazardous point protection
<b>Industrial sector</b>	Electronics, (electrical) precision engineering, optics
<b>Application location/machine type</b>	Solar
<b>Product family</b>	miniTwin4, Flexi Classic, ES21, i14 Lock, i12S, RE13
<b>Type of controller</b>	Flexi Classic

### Application in detail

#### Task

The hazardous point in the handling area of an input/output sorting station for solar cell boxes must be protected so that workers are not injured if they need to reach inside as part of the process. Easy integration of safety sensors is required. The installation conditions on site are generally very tight.

#### Solution

The miniTwin safety light curtain is ideal here. It is integrated into the plant control system using the modular Flexi Classic safety controller. The slim shape of the miniTwin allows it to be easily installed between the machine frame and housing, reliably protecting the hazardous point. The door is protected by the i12S safety switch, while the locking of the cover in the robot

handling area is monitored by the i14 Lock safety locking device. If a safety controller is not required, the function can be performed by a simple safety relay. Other safety-related sensors, such as an ES21 emergency stop pushbutton and RE13 magnetic safety switches, are located in the overall solar cell production plant.

#### Customer benefits

A major advantage is the networking of the safety sensors with the overall plant. The miniTwin safety light curtain is a key highlight, as its slim shape allows integration with optimum use of space. The miniTwin can be installed right into the corners of the machine, which means that there are no blind spots. A reduced range of variants and storage brings additional time and cost savings.

Further information	Page
→ miniTwin4	F-105
→ Flexi Classic	O-2
→ ES21	M-2
→ i14 Lock	K-49
→ i12S	K-6
→ RE13	L-13
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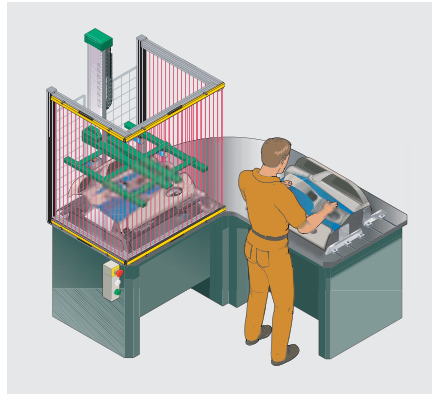


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## U-shaped hazardous point protection to improve ergonomics



### Application overview

Task	Hazardous point protection
Industrial sector	Automotive and other vehicles
Application location/machine type	Production line
Product family	miniTwin4, Flexi Classic
Type of controller	Flexi Classic

### Application in detail

#### Task

In the course of productivity optimization, ergonomic workstation design is becoming increasingly important. Semi-automatic production lines in particular are meeting the requirement of efficiently manufacturing rapidly decreasing batch sizes. Safety sensors need to be adapted to the design requirements brought on by these changes. In addition to this, the required integration of the sensor into the machine should increase protection against mechanical stress. The increasing use of more openly accessible designs such as the C frame allows quick access to materials. This not only leads to the use of the smallest machine dimensions possible, but also places new demands on safety light curtains. Short safety distances and flexible adjustment of the protective field must be realized. As well as in installation and commissioning, there is further potential for savings in warehouse management and order processing.

#### Solution

Thanks to its unique small size, the miniTwin4 safety light curtain can be adapted to individual machine designs. The miniTwin4 is designed in such a way that its protective field ensures short safety

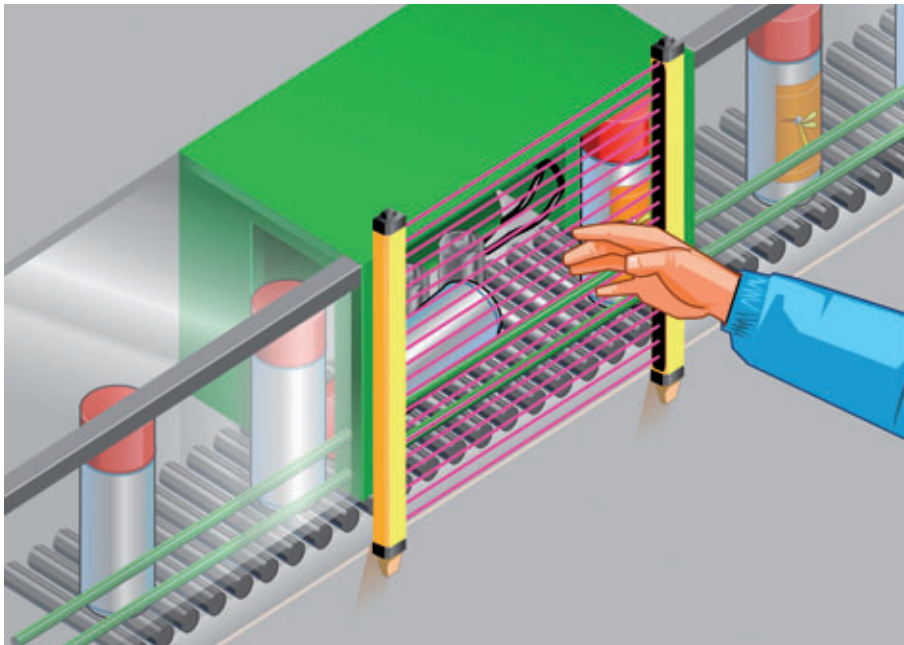
distances even in critical corner positions. The standard brackets allow simple mounting without special tools, even on standard profiles. The automatic self-configuration replaces the need for configuration tools and explanations on how to use them during commissioning. For the first time, the accessory has been integrated into the type code as part of the product.

#### Customer benefits

Ergonomically optimized machine access achieved via U-shaped protection is a prerequisite for maximum machine productivity. The miniaturization follows the trend for more compact machines intended to optimize usage of valuable production space. The high resolution, even in corner areas, together with the quick response time, means that for the first time, light curtain integration is technically sound, simple and affordable. Brackets suitable for standard profiles offer an alternative to in-house construction that ties up your resources. The concept of the unit stick reduces the number of system components, thus reducing the costs of the ordering, service and logistics processes. Administration costs for accessory parts are further reduced by ordering the accessory using the material number of the stick.

Further information	Page
→ miniTwin4	F-105
→ Flexi Classic	O-2
→ Services	B-0

## Protection of a labeling machine



### Application overview

<b>Task</b>	Hazardous point protection
<b>Industrial sector</b>	Packaging, pharmaceutical / medical, food & beverage
<b>Application location/machine type</b>	Labeling plant
<b>Safety functions</b>	Safety-related stop function, integration of safe automation and control system in same network
<b>Product family</b>	C2000 Eco, Flexi Classic, ES21
<b>Type of controller</b>	Flexi Classic

### Application in detail

**Task**

A labeling plant with automatic feed automatically sticks labels onto plastic containers. Within the plant, the process area needs to be protected so that the machine can be accessed quickly in case of a fault. During operation, the visual inspection by the operating personnel requires the construction to be as open as possible.

**Solution**

The labeling plant is protected by a C2000 safety light curtain. In conjunction with a

Flexi Classic safety controller and an ES21 emergency stop pushbutton, the machine has a full range of safety features.

**Customer benefits**

Compared to separating protective mechanisms, light curtains allow the plant to be accessed much more quickly in case of faults. Minimizing downtime has a positive effect on the throughput of the entire plant. The clear view of the process area provides ergonomic benefits for operating personnel.



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Further information	Page
→ C2000 Eco	F-261
→ Flexi Classic	O-2
→ ES21	M-2
→ Services	B-0



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## Hazardous point protection on a semi-automatic assembly station



### Application overview

Task	Hazardous point protection
Industrial sector	Assembly, handling, robotics, automation
Application location/machine type	Assembly station
Safety functions	Safety-related stop function, tool/machine protection
Product family	V300 Work Station Extended, Flexi Classic
Type of controller	Flexi Classic

### Application in detail

#### Task

In an assembly cell, miniature robots work on final assembly of small electronic components such as mobile telephones, PDAs, memory sticks, etc. This hazardous point must be protected as workers insert and remove parts. They could be injured by the robot during this activity. The operator required a modular configuration matching the machine design. The assembly cells can be up to 1.5 m wide.

#### Solution

The requirements were met with a V300 Work Station Extended safety camera system. It is placed in one of the corners of the assembly cell profile so that it does not interfere with the actual process. A reflector strip that can be individually adapted to

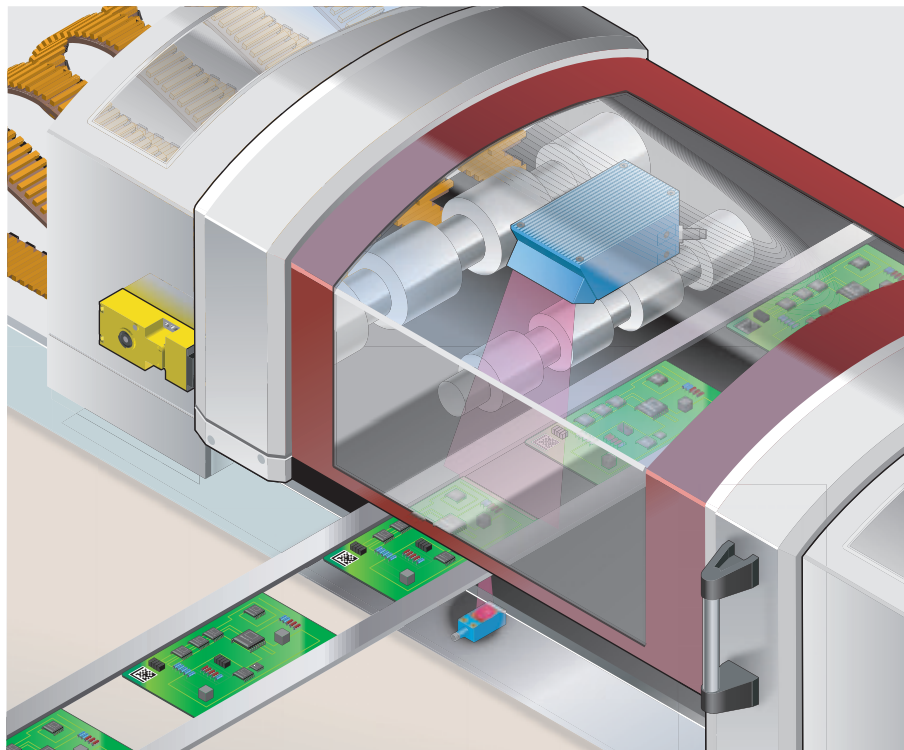
the shape is stuck onto the profile frame, making it almost invisible. Depending on the functionality, the V300 Work Station Extended is connected to a simple safety relay or a complete safety controller. A stop signal is generated if a person reaches into the protective field.

#### Customer benefits

The V300 Work Station Extended is universally compatible with different openings, which makes storage and planning considerably easier. Only one component is required instead of two, minimizing installation and cabling work. The intuitive operation using a simple teach-in button does not require additional software or expert knowledge.

Further information	Page
→ V300 Work Station Extended	E-2
→ Flexi Classic	O-2
→ Services	B-0

## Protection of the sliding door on an automatic placement machine



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### Application overview

Task	Hazardous point protection
Industrial sector	Automotive and other vehicles, electronics, (electrical) precision engineering, optics
Application location/machine type	Automatic assembly machines
Product family	i14 Lock, Flexi Classic
Type of controller	Flexi Classic

### Application in detail

#### Task

Pre-assembled circuit boards are fed to an automatic placement machine in the automotive supply industry. Opening of the sliding door must be controlled so that the dangerous movement is stopped before the door can be opened.

#### Solution

An i14 Lock safety locking device secures the sliding door to the automatic place-

ment machine. A stop button has to be pressed to open the door.

When the dangerous movement of the machine is stopped, the magnet operating voltage is applied, which then releases the locking magnet of the safety locking device and allows the door to be opened.

The safety signals are evaluated by the modular Flexi Classic safety controller.

#### Customer benefits

Maximum safety is ensured without stopping production due to opening the door at the wrong time.

Further information	Page
<a href="#">→ i14 Lock</a>	K-49
<a href="#">→ Flexi Classic</a>	O-2
<a href="#">→ Services</a>	B-0

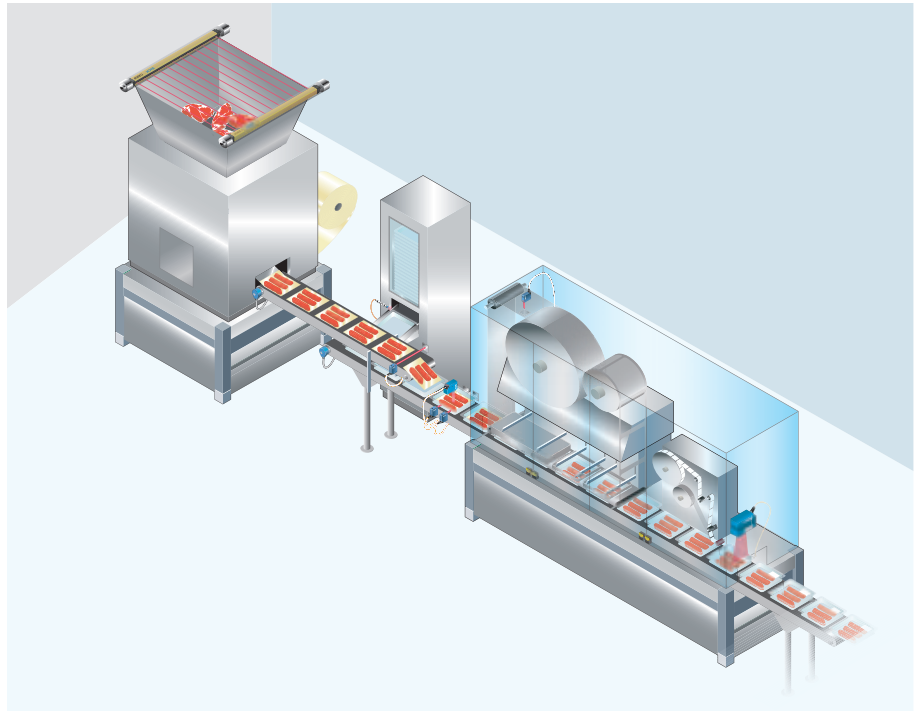


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## Door and fall-through protection on a sealing, cutting and labeling unit in the meat processing industry



### Application overview

Task	Hazardous point protection
Industrial sector	Food & beverage, packaging
Application location/machine type	Door and gate
Product family	C2000 Standard in IP69K Housing, ES21, i16S, Flexi Classic
Type of controller	Flexi Classic

### Application in detail

**Task**

The mincer's meat feed funnel and the door to a sealing, cutting and labeling unit for meat products must be protected. Machines and equipment in the meat processing industry are subject to special requirements such as cold and mandatory cleaning cycles with caustic chemicals.

**Solution**

These requirements can be met with the C2000 Standard in IP69K Housing safety light curtain and the i16S safety switch combined with the Flexi Classic safety controller. When the protective device is deliberately opened, the NC contacts on the safety switch are opened and the dangerous machine movement is stopped. The i16S safety switch has been developed for harsh everyday industrial use. The

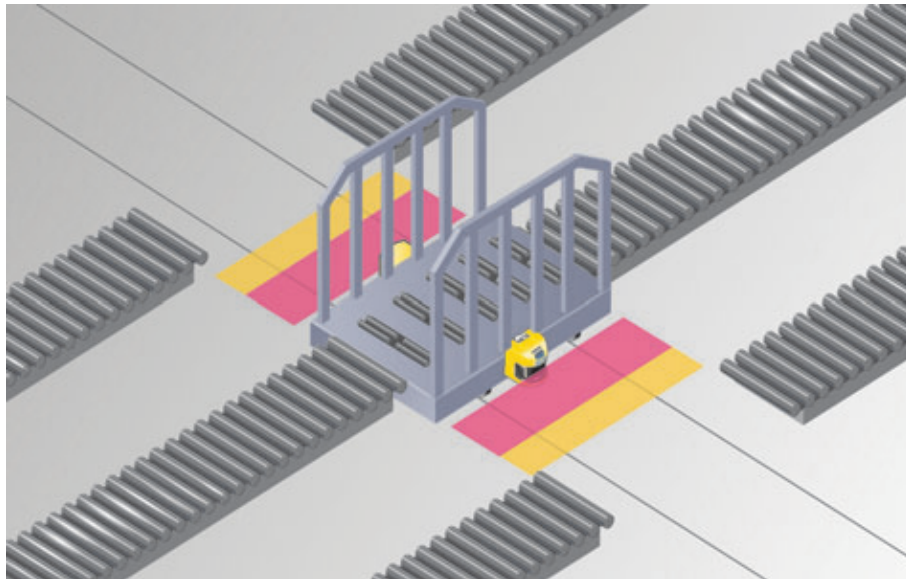
housing is made of glass fiber reinforced thermoplastic. The safety switches have an increased locking force and flexible actuators, making them ideally suited for the requirements of meat processing.

**Customer benefits**

The robust construction of the switch keeps downtime to a minimum. The increased locking force of the safety switch ensures that the door remains closed when vibrations or shocks occur and the machine continues running with no interruption. The extremely flexible actuators and the safety switch alignment aid fitted guarantee that the doors can easily be closed even with distortion. Maintenance work and downtime for the unit are significantly reduced.

Further information	Page
→ C2000 Standard in IP69K Housing	F-253
→ ES21	M-2
→ i16S	K-11
→ Flexi Classic	O-2
→ Services	B-0

## Hazardous area protection on a traversing bogie



### Application overview

<b>Task</b>	Hazardous area protection
<b>Industrial sector</b>	Storage and conveyor technology
<b>Application location/machine type</b>	Conveyor belts
<b>Safety functions</b>	Safety-related stop function
<b>Product family</b>	S3000 Professional

### Application in detail

**Task**

On a horizontal conveyor system, goods are transported back and forth between processing lines using a sliding carriage. Because people can cross the path of the sliding carriage, the carriage must be protected.

**Solution**

The sliding carriage is protected using two S3000 safety laser scanners that are attached in the two directions of travel. If a person or an object is detected by the warning field on the S3000, the sliding car-

riage slows down. If a person or an object enters the protective field, the carriage stops. Depending on the direction and speed, the protective fields are dynamically adapted by using incremental encoders.

**Customer benefits**

People can move freely in the hazardous areas, no mechanical protection is necessary.



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Further information	Page
→ S3000 Professional	D-3
→ Services	B-0

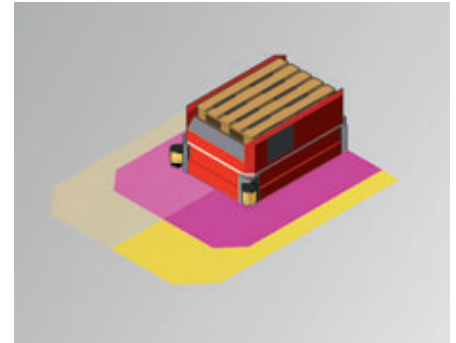
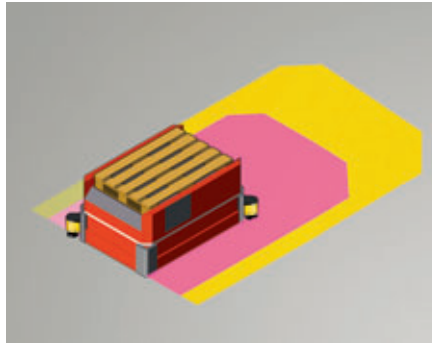


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## Protecting an automated guided vehicle with two protecting cases



### Application overview

<b>Task</b>	Hazardous area protection
<b>Industrial sector</b>	Storage and conveyor technology, transport, traffic, logistics
<b>Application location/machine type</b>	Driverless transport systems
<b>Safety functions</b>	Monitoring safe speed/velocity, safety-related stop function, tool/machine protection
<b>Product family</b>	S300 Professional

### Application in detail

**Task**

Small, extremely low vehicles transport pallets from one storage area to the next. During this process, a collision with people or material must be prevented.

Two protecting cases are required. In one case moving the vehicle in all four directions, and in the other case only straight ahead and also around tight bends. The vehicles also move along tight corridors such that there is no space for bumpers.

**Implementation**

The ideal solution for the protection of people and prevention of collisions was provided by the S300 safety laser scanner.

Two very compact devices, hardly larger than coffee cups, are mounted opposite each other on two edges for all-round protection. Each scanner has a scanning angle of 270° so that the vehicle is protected on all sides. On vehicles driving straight ahead and around bends, two scanners are fitted to the front edge and reliably detect obstacles on bends.

Up to four field sets, each comprising a protective field/warning field are defined and saved so that when there is a change in the monitoring situation, it is possible to switch to a different field set. In this way hazardous areas are monitored differently at varying velocities. Warning fields and protective fields are small when moving at low speeds; at higher speeds they become larger. If a person enters the warning field, the vehicle slows; if the person reaches the protective field, the vehicle stops. The same applies to obstacles that cross the route. A restart delay after a stop can be configured for a time from 2 to 60 seconds.

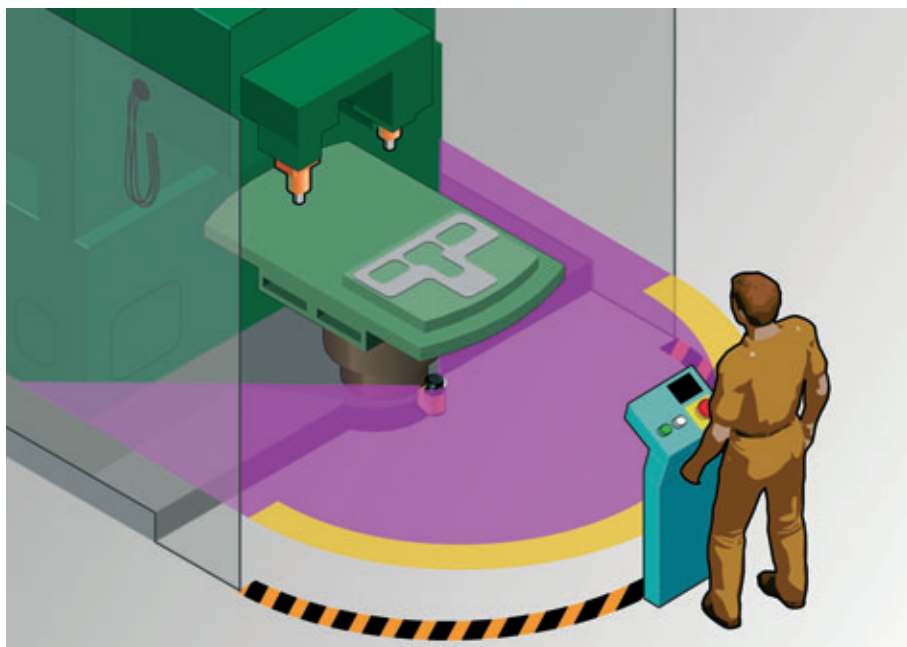
**Customer benefits**

Thanks to its 270° scanning angle, up to two scanners are used for all-round protection. Driving around tight bends is possible without problems due to the scanner's compact size. The dynamic adjustment of the scanner's field sets increases transport efficiency.

Further information	Page
<a href="#">→ S300 Professional</a>	D-67
<a href="#">→ Services</a>	B-0



## Hazardous area protection on a rotary table



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### Application overview

Task	Hazardous area protection
Industrial sector	Machine tool, automotive and other vehicles
Application location/machine type	Automatic machining centers
Safety functions	Safety-related stop function, prevention of unexpected start-up
Product family	S300 Standard, Flexi Classic, ES21
Type of controller	Flexi Classic

### Application in detail

#### Task

A rotary table in component manufacturing must be protected against unauthorized access, as there is a considerable risk of injury due to the machine. A low-cost solution with little mounting effort was sought.

#### Implementation

The S300 safety laser scanner was selected. With its scanning angle of 270°, this device scans the entire area in front and at the side of the rotary table that can be entered by people. As a result, only one scanner is necessary, saving considerable costs and installation effort. The S300 switches the output signal switching devices to the OFF state when the protec-

tive field is interrupted. Via the Flexi Classic safety controller, the shutdown of the machine is initiated.

#### Customer benefits

The sensor scans the hazardous area with a protective field of up to 2 metres using a scanning angle of 270°. As a result one S300 is sufficient in this application to scan the entire hazardous area making light curtains or other additional sensors unnecessary. Installation effort and maintenance effort are reduced and costs saved. The ES21 emergency stop pushbutton and the S300 safety laser scanner are monitored by one Flexi Classic module only.

Further information	Page
→ S300 Standard	D-86
→ Flexi Classic	O-2
→ ES21	M-2
→ Services	B-0

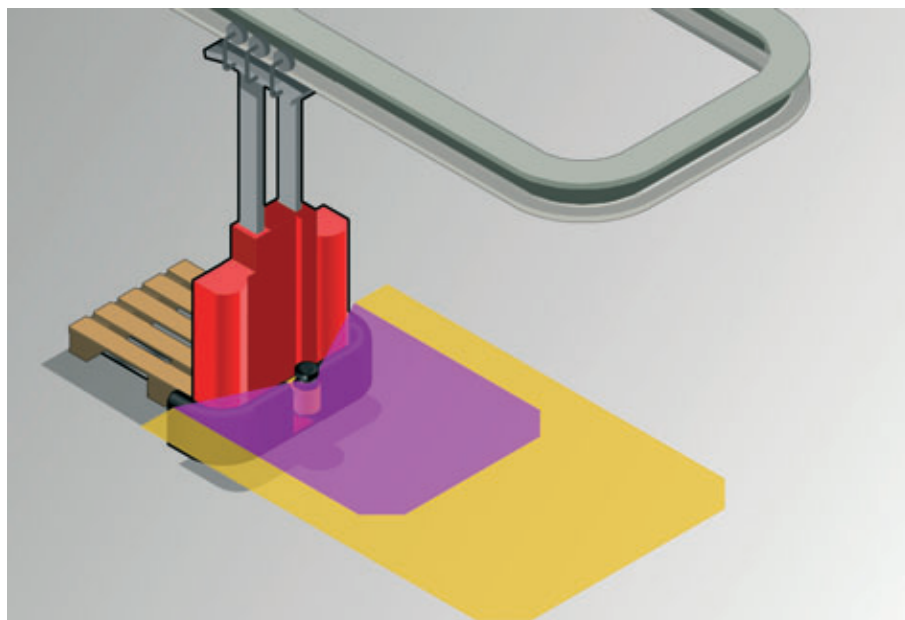


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## Hazardous area protection and collision prevention measurement on overhead conveyors



### Application overview

Task	Hazardous area protection
Industrial sector	Transport, traffic, logistics, storage and conveyor technology
Application location/machine type	Conveyor belts
Safety functions	Monitoring safe speed/velocity, safety-related stop function, tool/machine protection
Product family	S300 Professional

### Application in detail

**Task**

In large warehouses with overhead conveyor systems, people crossing under the conveyors must be protected. A second requirement is the avoiding of collision between the individual overhead conveyors, which are designed to be close together. The risk of possible collisions must be completely excluded.

**Implementation**

The S300 safety laser scanner of this application meets the requirements safely and reliably. With a scanning angle of 270°, the movement around 180° bends is not a

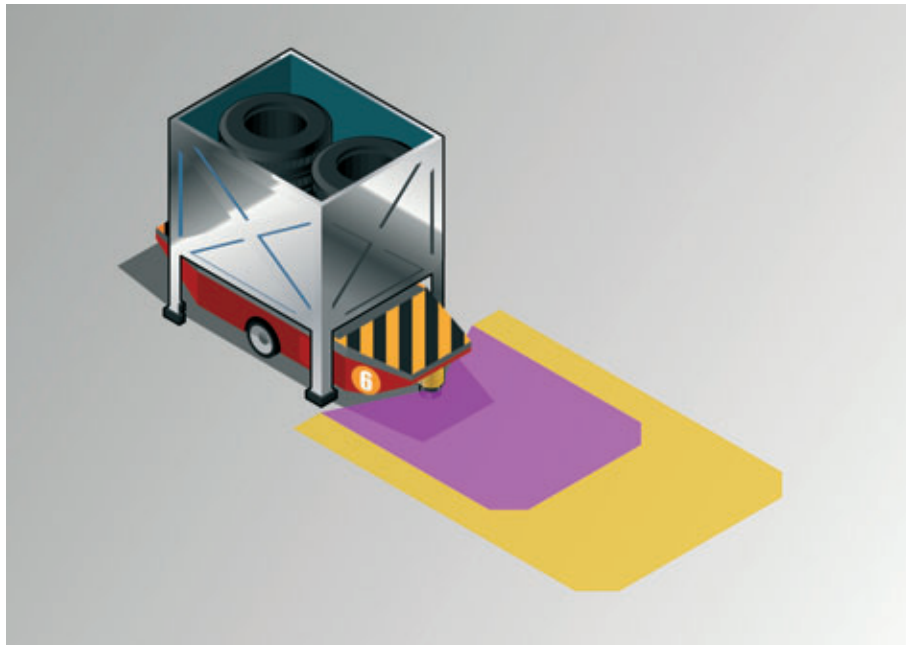
problem. If there is a person or an object in the movement area, the S300 ensures the suspended conveyor slows down and stops if necessary. The spacing is also always maintained safely using the warning field function. The warning fields and protective fields are switched as a function of the speed or conveyor route.

**Customer benefits**

Area protection, collision prevention and even protection on bends is very elegantly and cost effectively mastered with one device only.

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<a href="#">→ S300 Professional</a>	D-67
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## Mobile hazardous area protection on a pick-up transport vehicle



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### Application overview

<b>Task</b>	Hazardous area protection
<b>Industrial sector</b>	Automotive and other vehicles, storage and conveyor technology
<b>Application location/machine type</b>	Driverless transport systems
<b>Safety functions</b>	Monitoring safe speed/velocity, safety-related stop function, tool/machine protection
<b>Product family</b>	S300 Professional

### Application in detail

#### Task

In tire manufacture, the tires are transported to a balancing check and back again using an automated guided vehicle system. The route is crossed by workers and there may be obstacles, as a result, that the vehicle must use a protective device.

#### Implementation

The S300 safety laser scanner is used for the protection of people and prevention of collisions. The very compact device, hardly larger than a coffee cup, is mounted in the direction of travel. Up to four field sets each comprising a protective field and warning field are configured so that with a change

in the monitoring situation, it is possible to switch to a different field set. In this way hazardous areas are monitored at varying speeds. If a person enters the warning field, the vehicle slows down; if the person reaches the protective field, the vehicle stops. The same applies to obstacles that cross the route. A restart delay after a stop can be configured for a time from 2 to 60 seconds.

#### Customer benefits

- Flexible solution in a highly automated environment
- Optimal adaptation to the situation
- Provides optimal protection for people and against collisions

Further information	Page
→ S300 Professional	D-67
→ Services	B-0

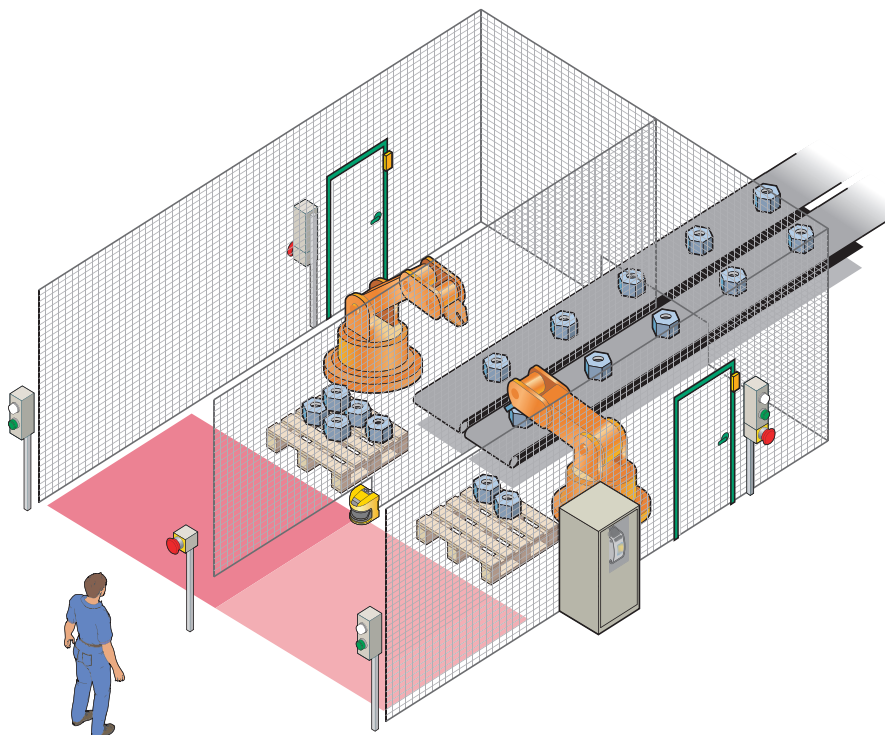


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## Hazardous area and access protection of a robot cell



### Application overview

<b>Task</b>	Hazardous area protection, Access protection
<b>Industrial sector</b>	Assembly, handling, robotics, automation
<b>Application location/machine type</b>	Robot station
<b>Safety functions</b>	Emergency stop function, safety-related stop function, reset/restart, control functions and operating mode selection, position monitoring
<b>Product family</b>	S3000 Standard, Flexi Soft, ES21, IN4000
<b>Type of controller</b>	Flexi Soft

### Application in detail

**Task**

In two neighboring work cells, two robots independently place workpieces on pallets. The working areas of the robots are surrounded by fences. Access through two service doors is to be protected by safety switches. The safety switches stop the robot. Two emergency stop pushbuttons at the doors also stop the robots. The access for the fork lift truck is protected using laser scanners that interrupt the movement of the robots if one of protective fields they monitor is entered. An emergency stop pushbutton on each door as

well as on the entrance stop both robots. The monitoring devices are linked by a control unit that ensures both robots operate safely.

**Implementation**

The extremely flexible safety controller Flexi Soft meets these requirements. It secures the two robot working areas independent of each other. The S3000 safety laser scanner can also monitor a simultaneous protective field. Using its EFI function (Enhanced Function Interface), the Flexi

Further information	Page
→ S3000 Standard	D-19
→ Flexi Soft	O-25
→ ES21	M-2
→ IN4000	L-48
→ Services	B-0

Soft can evaluate the two protective fields independent of each other.

The Flexi Soft modular safety controller is configured using intuitive software with a graphical user interface. This makes it possible to design the application with complete flexibility.

The dual channel contacts on the emergency stop pushbuttons and safety switches are monitored for cross-circuits. It is possible to monitor (external device monitoring) the safety relays connected to the outputs.

By using extended sensor functions with an EFI interface, a second laser scanner is not necessary. An additional scanner would otherwise be required for monitoring an independent protective field for a second robot.

The circuit configuration can also be quickly modified and expanded at any time. This action can be undertaken easily with the aid of an intuitive function block-based logic editor. Addi-

tional devices such as a safety command device for safely setting up the system or safety locking devices can be easily connected using expansion modules. The Flexi Soft system can be expanded to up to 96 inputs and 48 outputs.

#### Customer benefits

- Usage of the expanded sensor functions by means of the EFI interface
- Modular construction: The control grows with the application
- Direct sensor connection
- Fast response times
- Space saving
- Logic configuration as required via software
- Optional diagnostics module
- Easy field bus connection via diagnostics modules



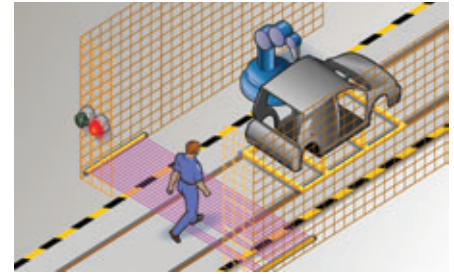
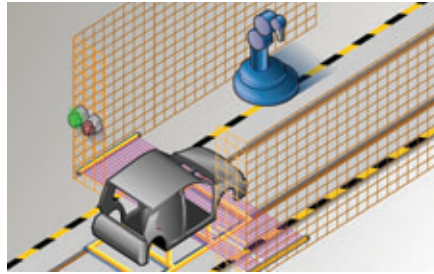


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## Access protection on a transfer route with differentiation between man and material



### Application overview

Task	Access protection
Industrial sector	Automotive and other vehicles
Application location/machine type	Robot station
Safety functions	Differentiation between man and material (muting alternative), safety-related stop function
Product family	C4000 Fusion, Flexi Classic
Type of controller	Flexi Classic

### Application in detail

#### Problem

In automotive body production, unfinished car bodies are automatically transported into the dangerous area of a robot cell. If a person enters this area, the robot must be stopped immediately.

#### Solution

The C4000 Fusion safety light curtain, which features dynamic, self-teach muting, is used. The continuously active sensor is difficult to manipulate and thus provide maximum safety up to category 4. It automatically learns material patterns based on the size, distances and sequence

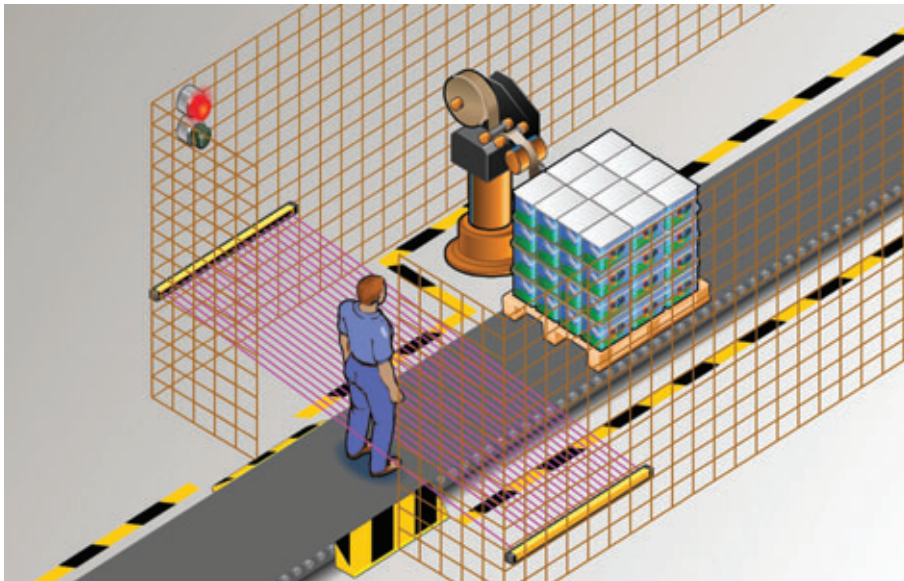
and monitors these patterns. Entry of persons results in an immediate shutdown. The protective field length of 900 mm ensures that it is not possible to unintentionally trigger the safety mechanism.

#### Customer benefits

An economical solution, as there is no need for additional sensors or additional protective measures such as muting sensors, muting lamps or swing doors. The compact sensor pair is insensitive to interference and offers maximum availability.

Further information	Page
<a href="#">→ C4000 Fusion</a>	F-205
<a href="#">→ Flexi Classic</a>	O-2
<a href="#">→ Services</a>	B-0

## Access protection without muting with automatic detection of goods



### Application overview

Task	Access protection
Industrial sector	Storage and conveyor technology, packaging
Application location/machine type	Palletizer
Safety functions	Safety-related stop function, differentiation between man and material (muting alternative)
Product family	C4000 Palletizer Standard, ES21, Flexi Classic
Type of controller	Flexi Classic

### Application in detail

#### Task

Wherever materials are transported automatically, there are dangerous areas such as robot stations, rotary tables, palletizers, feed mechanisms or strapping machines. These areas must be protected so that the machine stops if a person enters the hazardous area. In addition, the transport direction of the material can be detected.

#### Solution

The C4000 Palletizer Standard safety light curtain is the ideal solution for these requirements. It does not need any additional sensors or indicator lamps, and thus provides considerable benefits in terms of savings in planning, design, installation, connection and operational support service. The safety light curtain detects people entering dangerous areas on machines, but allows material to be transported into and out of these areas. The objects must fit into

the defined window (for goods detection, you configure a minimum and maximum object size of approx. 500 mm – maximum object size protective field –150 mm) and their size is then monitored precisely and automatically as they pass through. This enables the system to monitor and evaluate coverage of individual light beams and a minimum size. This automatic detection of packages without programming work provides maximum operating flexibility. The adjustment of muting sensors that is normally required when changing batches is completely eliminated.

#### Customer benefits

The C4000 Palletizer Standard is delivered with the "goods detection" feature already activated. Teach-in of a new pattern is carried out automatically during operation. The system can also process the signals from the transport unit. This enables the



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→ C4000 Palletizer Standard	F-192
→ ES21	M-2
→ Flexi Classic	O-2
→ Services	B-0

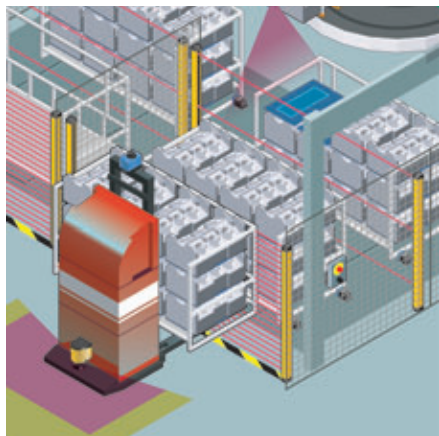
transport direction of both the goods and the pallet to be detected. Integrated speed monitoring has a positive effect on the safety distance analysis. The C4000 Palletizer Standard also features gap suppression, which means that loose packages are detected as an entire

object. Reduced resolution allows loose strapping or protruding edges to be ignored. In addition, the reduction in components compared to muting solutions cuts the frequency of failure, significantly increasing system availability.

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## Protecting the loading and unloading station of a machining center



### Application overview

Task	Access protection
Industrial sector	Machine tool
Application location/machine type	Panel dividing saws, edge-banding machine, machining center
Product family	C4000 Eco, ES21, Flexi Soft, M4000 Standard
Type of controller	Flexi Soft

### Application in detail

#### Task

A loading and unloading station before the processing line must be protected so that the robot can load and unload pallets while people bring racks into the station or collect them. The gantry robot should only be stopped if a person approaches the critical area.

#### Solution

The protection is provided by C4000 safety light curtains and M4000 multiple light beam safety devices. They protect the loading and unloading station before the processing line against access by personnel. Both protective devices are connected together in a safety circuit. If an empty rack is brought into the station or a filled rack collected, the C4000 light curtain is inter-

rupted, in which case the M4000 takes over the protection function. During loading and unloading of the racks, the gantry robot can continue working. It is only stopped if the M4000 is tripped. Safety command devices such as an ES21 emergency stop pushbutton and reset button are mounted outside the hazardous area on the fence.

The safety devices are connected and evaluated using a Flexi Soft safety controller. Inductive proximity sensors (IQ40) report the presence of the racks in the stations.

#### Customer benefits

Connection of the sensors allows work to be performed efficiently in the loading and unloading station, which saves time and money.



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→ C4000 Eco	F-168
→ ES21	M-2
→ Flexi Soft	O-25
→ M4000 Standard	G-21
→ Services	B-0

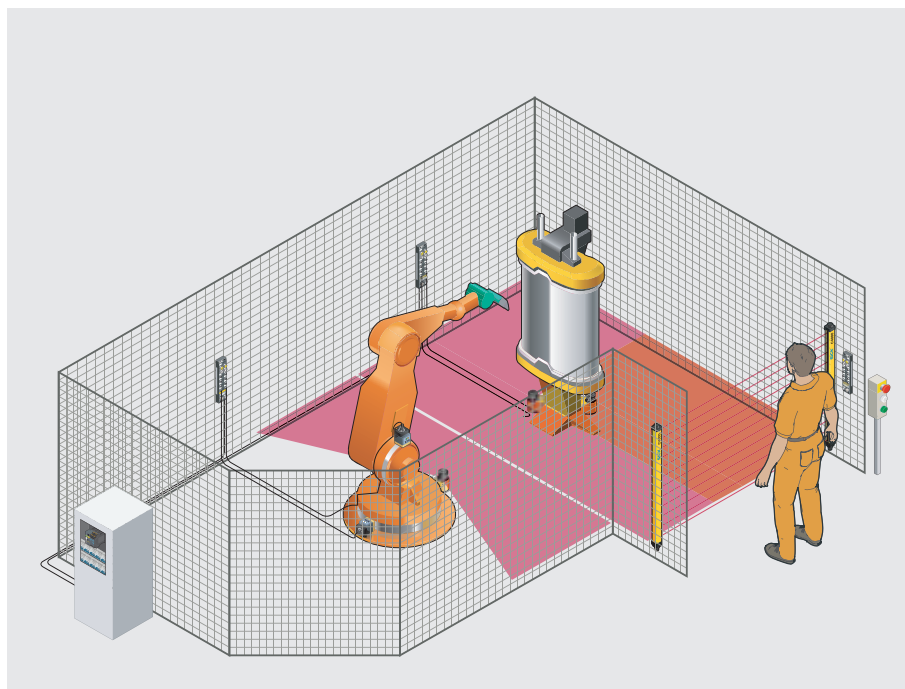


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## Multiple protection of a robot cell



### Application overview

Task	Access protection
Industrial sector	Automotive and other vehicles
Application location/machine type	Robot station
Product family	C4000 Standard, ES21, IN4000, S300 Standard, UE4470, UE4457
Type of controller	UE4457, UE4470

### Application in detail

**Task**

A robot cell is used to manufacture modules for the automotive supply industry, in this case the casing for a fuel tank. It has a cover and base, i.e., the robot folds and crimps the parts together. While the robot is working, the cell must be protected so that the robot will be stopped if anyone enters the area.

**Solution**

The C4000 safety light curtain was chosen to protect the robot cell. However, as it is possible to "stand behind" this, additional safety features are required: two S300 safety laser scanners mounted diagonally provide the cell with comprehensive protection. On the robot, IN4000 safety switches monitor the movements of axes 1 and 2,

ensuring that people who are standing (unauthorized) behind or directly adjacent to the robot are protected. In front of the robot, an additional S300 safety laser scanner monitors the robot's working area. If a worker enters or passes through this area while the robot is operating, an emergency stop is triggered. All safety sensors, as well as the emergency stop pushbutton and signal generators, are connected to the UE4470 safety controller using UE4457 safety remote I/Os and with the robot controller using a safety network.

**Customer benefits**

The cabling in this application is significantly reduced. The simple programming of the UE4470 safety controller cuts the commissioning time, which saves money.

Further information	Page
→ C4000 Standard	F-29
→ ES21	M-2
→ IN4000	L-48
→ S300 Standard	D-86
→ UE4470	P-17
→ UE4457	P-32
→ Services	B-0

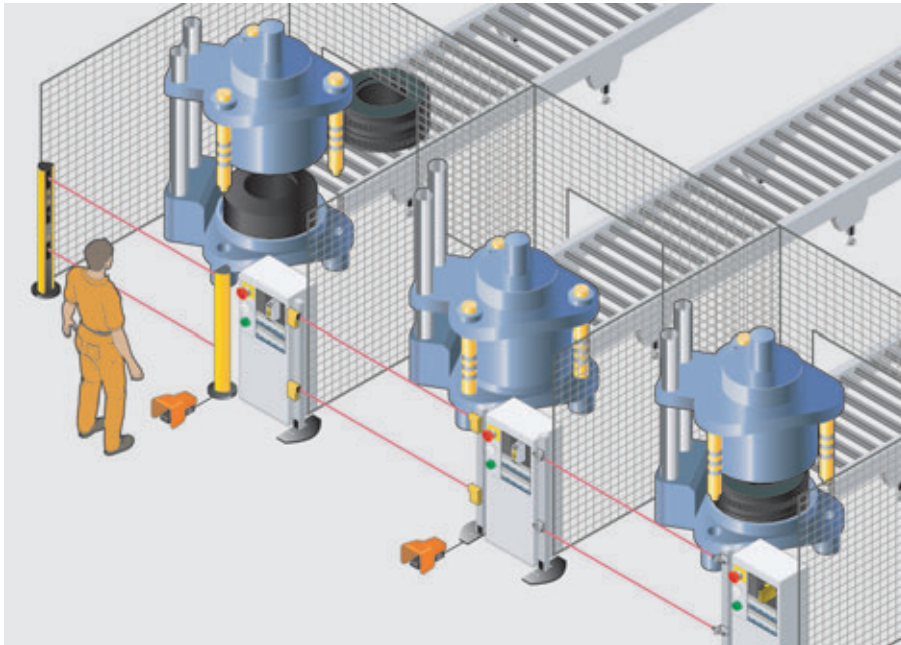
## Access protection with different safety sensors



Application  Finder

C

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### Application overview

Task	Access protection
Industrial sector	Automotive and other vehicles
Application location/machine type	Presses
Product family	ES21, L4000, M4000 Standard, Flexi Soft, WSU/WEU26-3
Type of controller	Flexi Soft

### Application in detail

#### Task

During final moulding and profiling of "green tires", on which the road resistance is cut to reduce the burden on the environment, access to the presses must be protected so that the press can be stopped as soon as a person enters the area. In this case, the worker uses a mechanism to remove the tire from a truck and loads it into the negative mould of the press. The tire is pneumatically pressed against the mould and "cooked."

#### Solution

Access points to the presses are protected by three different safety sensors:

- M4000 multiple light beam safety device, fitted in device columns
- Two WSU/WEU26-3 single beam photoelectric safety switches, and
- Two L4000 single beam photoelectric safety switches

The M4000 and WSU/WEU26-3 are connected to a modular Flexi Soft safety controller, which evaluates the press control signals such as top dead center (TDC), bottom dead center (BDC) and overtravel monitoring. It also evaluates the signals from the foot switch and the ES21 emergency stop pushbutton.

#### Customer benefits

The combination of safety sensors with safety controllers and emergency stop pushbuttons provides comprehensive protection on this machine.

Further information	Page
→ ES21	M-2
→ L4000	H-2
→ M4000 Standard	G-21
→ Flexi Soft	O-25
→ WSU/WEU26-3	H-17
→ Services	B-0

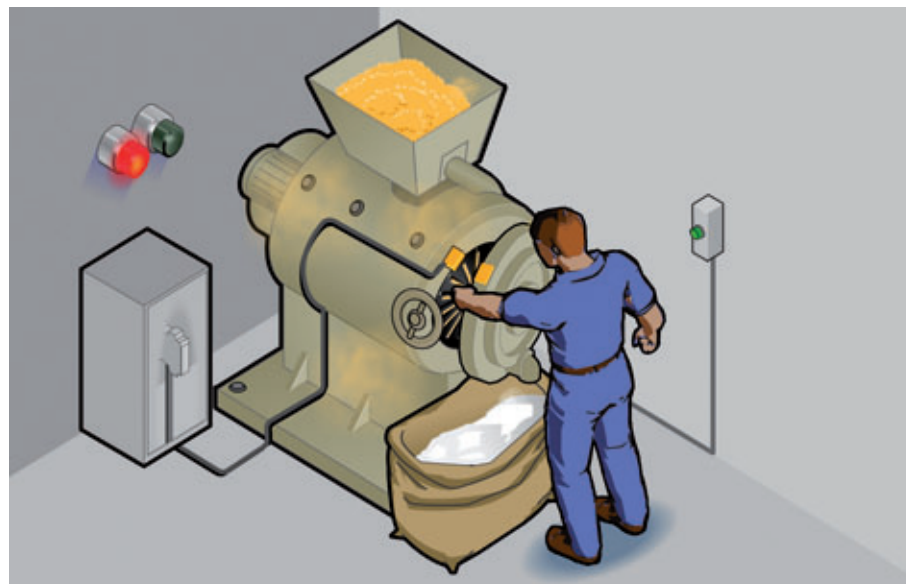


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## Protection of the flaps on a milling machine



### Application overview

Task	Access protection
Industrial sector	Food & beverage
Application location/machine type	Mill work
Safety functions	Safety-related stop function
Product family	T4000, ES21, Flexi Classic
Type of controller	Flexi Classic

### Application in detail

#### Task

In a spice mill, natural products such as stinging nettles, elder, various types of tea and mint are ground. For this purpose the products are added to a hopper from above, pass through the mill and are collected in a container. For the removal and addition of product to the mill, a pivoting flap must be opened. During this process, there is a considerable risk of injury if the mill is still running.

Initial protection measures involved the use of mechanical interlocks. These mechanisms failed after only a short time due to the harsh ambient conditions. The deposits from the natural products containing dust and resin on the actuators and in the switch housings caused significant machine downtime due to faults.

#### Solution

The T4000 safety sensor was used. This sensor uses an actuator, read head and evaluation unit.

The fixed code, battery-free actuator is fitted to the flap on the mill, the inductive read head to the mill housing.

In the closed state the actuator is in the read head field. Here the code is read continuously. As long as data transmission continues, the mill is in operation. When the flap is opened, the actuator is removed from the read head transmission field. The data communication is interrupted and the evaluation unit shuts down the mill. It is then safe to remove and add new product. After closing the pivoting flap, the mill is switched on again by pressing the reset button. In case of emergency the mill can be stopped immediately by the ES21 emergency stop pushbutton. The Flexi Classic modular safety controller handles the evaluation of the command devices and the non-contact safety switch.

#### Customer benefits

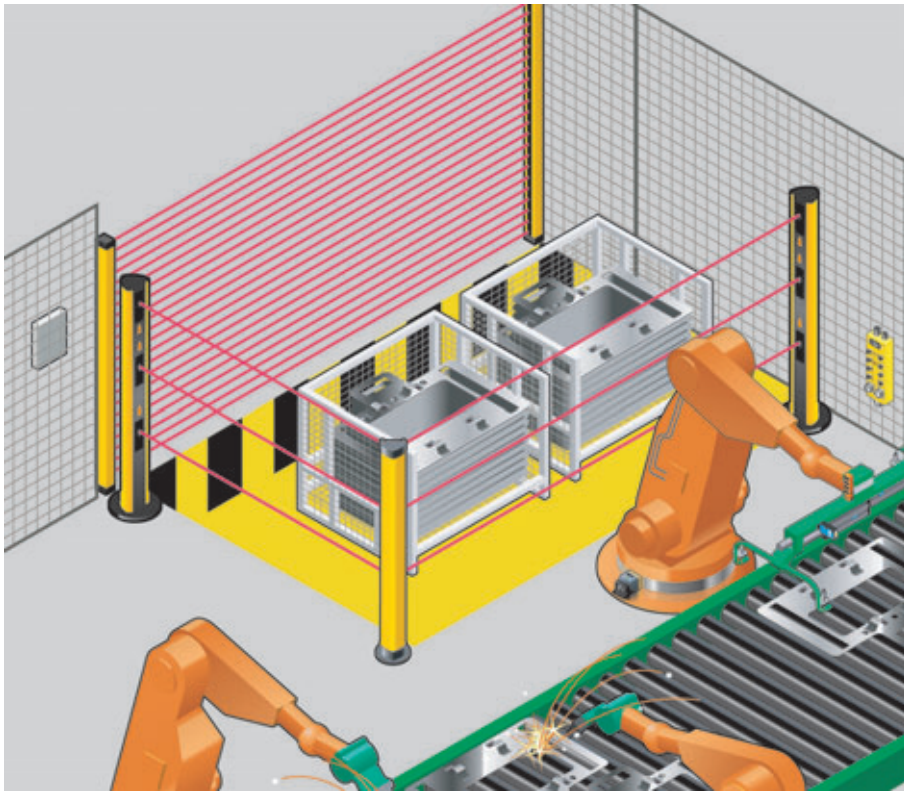
- Immune to contamination, the faults and machine downtime are reduced

Further information	Page
→ T4000	L-23
→ ES21	M-2
→ Flexi Classic	O-2
→ Services	B-0

## Safe functions in manufacturing – Material removal point in a rack station



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### Application overview

Task	Access protection
Industrial sector	Machine tool
Application location/machine type	Rack station
Safety functions	Integration of safe automation and control system in same network, emergency stop function, safe position monitoring, safe gate function, safety-related stop function, reset/restart
Product family	UE4457, C4000 Standard, IN4000, ES21, M4000 Standard
Type of controller	UE4457

### Application in detail

#### Task

In a rack station in front of a robot cell, the racks are often manually removed by a worker after filling. During this process, it must be ensured the robot stops if a person enters the cell. However, the robot is allowed to continue work at a different point during removal.

#### Implementation

The logic for the application is defined directly on site at the removal point by linking inputs and outputs on certified function

blocks in the UE4457 safety remote controller. The access area at the removal point is protected by a C4000 safety light curtain. An access request for the manual removal is triggered by the operator. The loading robot moves to its safe end position (monitored by an IN4000 non-contact safety switch), then the light curtain used as the outer protective device is muted and the operator can enter the hazardous area. The filled pallet can then be replaced. The non-contact safety switch is evaluated directly in the remote controller without any

Further information	Page
→ UE4457	P-32
→ C4000 Standard	F-29
→ IN4000	L-48
→ ES21	M-2
→ M4000 Standard	G-21
→ Services	B-0

further evaluation unit. The inside edge of the removal point is also protected on two sides with an M4000 multiple light beam safety device and a deflector mirror. This protective device is only active during pallet removal and enables the robot to continue working at a different point during removal.

After leaving the removal point, the access request is reset and acknowledged by the operator (reset and restart). The light curtain in the access area is re-activated and the multiple light beam safety device in the interior muted again; the robot can continue loading.

A control unit with access request, ES21 emergency stop push-button, a reset button, a restart button and indicators com-

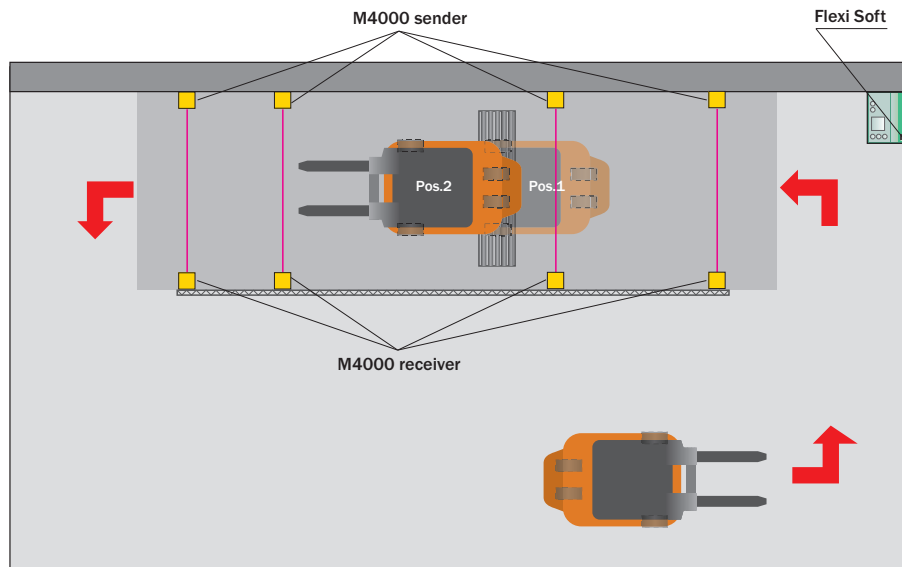
pletes the safety concept that is implemented directly in a UE4457 safety remote controller using de-centralized logic.

#### **Customer benefits**

The programmable safety system supports the automatic manufacturing process and provides optimal protection for the operator. The safety automation is simple and very fast due to the networking of the products. The wiring effort is minimized. De-centralized monitoring and diagnostics mean that the actions to be taken when the machine is at a standstill are straightforward.

**C**

## Coordination of various safety sensors on a forklift truck test bench



### Application overview

Task	Safety automation, access protection
Industrial sector	Storage and conveyor technology
Application location/machine type	Forklift truck rolling road
Safety functions	Emergency stop function, safety-related stop function, reset/restart, control functions and operating mode selection
Product family	ES21, Flexi Soft, M4000 Standard
Type of controller	Flexi Soft

### Application in detail

#### Task

A manufacturer of industrial vehicles must protect a test bench for forklift trucks. The varying vehicle size, the sequential testing of the front and rear wheels, as well as the automatic and manual operating modes required made the installation of several M4000 multiple light beam safety devices necessary. A suitable controller is to take over the co-ordination of the electro-sensitive protective equipments as well as the two emergency stop pushbuttons and the reset button on the test bench.

#### Implementation

These functions are performed by the modular Flexi Soft safety controller. Due to extensive safety functions, e.g., emergency stop or reset, it is possible to flexibly and efficiently protect machines and systems with high safety requirements. The four operating modes, i.e., accessing and evaluating the signals from the four M4000, the two emergency stop pushbuttons and the

reset buttons are safely linked by the Flexi Soft using the operating mode selector switch. Two M4000 are installed in the entrance in front of the driven rollers and two more on the exit from the test stand. The test stand operator first moves the vehicles into the station by remote control. In this situation, operating mode 1, all M4000 are deactivated. When the non-driven front wheels reach the roller segment, only the M4000 in the immediate vicinity of the forklift truck are active, operating mode 2. When the driven axle is tested, all four M4000 are active, operating mode 3: The outer devices prevent unauthorized access; the inner devices shut down the test bench if the forklift truck jumps off the rollers. Along with automatic operating modes, it is also possible to operate the test stand manually (operating mode 4) - specifically for forklift trucks from other manufacturers. In this case when the operator actually drives the forklift truck onto the test bench, only the outer



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Further information	Page
→ ES21	M-2
→ Flexi Soft	O-25
→ M4000 Standard	G-21
→ Services	B-0

M4000 on the entry side is active, because the worker only has limited visibility to the rear during the test. In this way unauthorized access to the hazardous area by other people is prevented, the area in front of the forklift truck can be clearly seen by the operator.

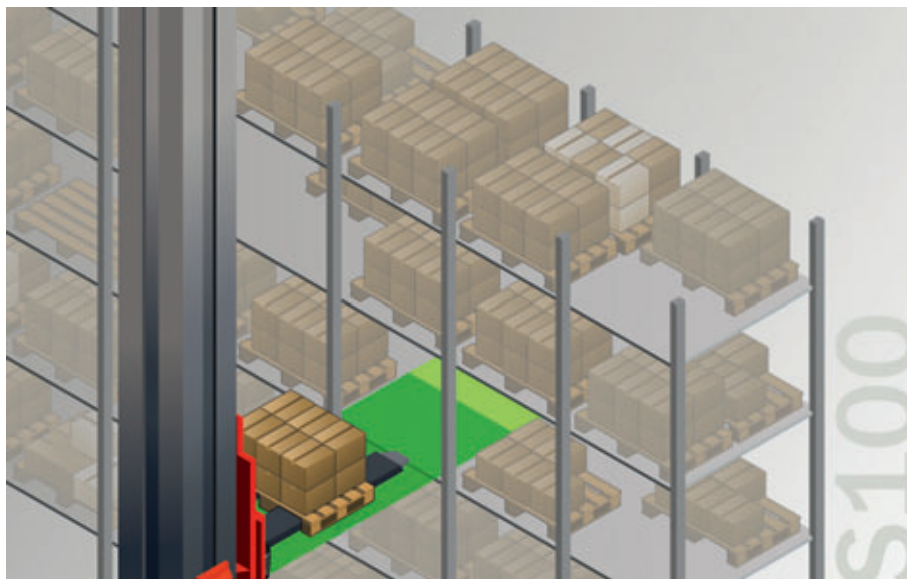
**Customer benefits**

The Flexi Soft enables the signals from several items of ESPE to be processed simultaneously. Various operating modes can be configured with safety logic without extensive effort.

**C**



## Bay monitoring and collision prevention using high-bay stackers



### Application overview

Task	Collision prevention
Industrial sector	Storage and conveyor technology
Application location/machine type	High-bay warehouse
Product family	S100 Standard

### Application in detail

#### Task

An automatic shelving storage and retrieval unit moves back and forth in a high-bay warehouse to store and retrieve material from shelf bays. Prior to storage, the space available in the shelf bay must be checked so that collisions are prevented between material to be stored and material already in the bay.

#### Implementation

An S100 laser scanner is fitted above or underneath the device for picking up loads on a shelving storage and retrieval unit; this unit is programmed such that its pro-

tective field scans all the space in the storage bay. Before the goods are stored, the S100 checks whether the storage bay is still empty. This check prevents goods already stored from being pushed out the other side and damaged. A dangerous situation could also arise in high-bay warehouses if goods fall to the floor.

#### Customer benefits

By using the laser scanner, the storage process is smoother, as collisions are prevented and goods protected against damage.



Application  Finder

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Further information	Page
→ S100 Standard	D-113
→ Services	B-0

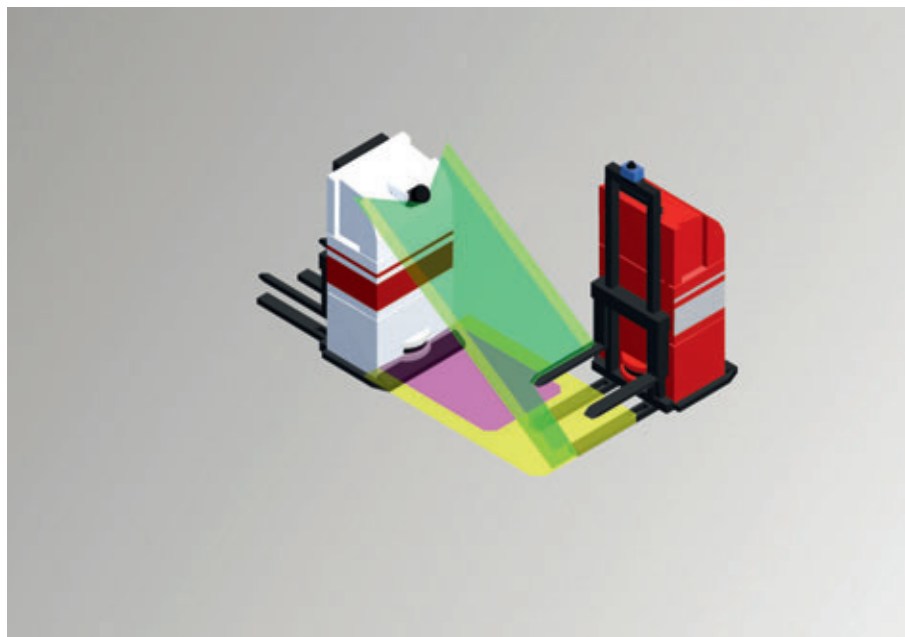


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## Collision prevention and hazardous area protection on automated guided vehicle



### Application overview

Task	Collision prevention, hazardous area protection
Industrial sector	Storage and conveyor technology, transport, traffic, logistics
Application location/machine type	Warehouse/production area
Product family	S100 Standard, S300 Professional

### Application in detail

**Task**

Automated guided vehicles that perform pallet handling in a high-bay warehouse are to be protected against collisions with objects that could be found on their route. These obstacles are not detected by the S300 Professional safety laser scanner for protecting people, because these are mounted at ground height.

**Implementation**

A mobile S100 laser scanner mounted to the vehicle scans a wide area in front of the AGV. It has a 2-dimensional scanning field pointing at a downward angle or moving up

and down. Collisions are prevented with hanging objects, protruding objects, or with the forks on other forklift trucks that could also pose a risk to personnel.

**Customer benefits**

The S100 laser scanner provides object detection and machine protection with a high level of flexibility. Because it is compact and lightweight, it permits quick, straightforward and optimal integration. Costs due to damage to the vehicle and material can be saved and the product life-cycle is increased.

Further information	Page
→ S100 Standard	D-121
→ S300 Professional	D-67
→ Services	B-0

## Rear space monitoring on a forklift truck



### Application overview

Task	Collision prevention
Industrial sector	Storage and conveyor technology, transport, traffic, logistics
Application location/machine type	Warehouse/production area
Product family	S100 Standard

### Application in detail

#### Task

The space behind a forklift truck could pose many hazards. It is difficult for the driver to see and is therefore needs to be protected against collisions, which result in a reduction in the workload on the driver.

#### Implementation

The S100 laser scanner is mounted near the ground in the rear turning area on the forklift truck and monitors the area behind the forklift truck using two switching fields of different sizes. When traveling in

reverse, the approach of objects is signaled using two switching levels. The first level is a warning with, e.g., a yellow light; at the second level, movement is limited or stopped and a red light illuminates.

#### Customer benefits

Due to collision prevention, damage to the vehicle and goods can be avoided without impairing the driver's flexibility (driver assistance).

Application  Finder

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#### Further information

#### Page

[→ S100 Standard](#)

D-113

[→ Services](#)

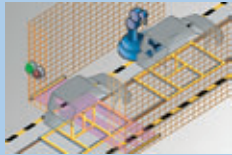


B-0

# Overview for access protection with differentiation between man and material





## Selecting the most suitable solution

In the following information, you will find the most important products for performing access protection with differentiation between man and material. Let us help you with the various advantages of individual solutions for your application.



Principle	Type acc. to IEC 61496	Typical application/sensor	Function and criteria	Advantages, safety and notes	Page
Object pattern recognition	Type 4	Transporting items on transport aids, e.g. skids  C4000 Fusion	<ul style="list-style-type: none"> <li>Function                             <ul style="list-style-type: none"> <li>Dynamic blanking for object pattern recognition: differentiation between complex objects in the protective field plane (e.g., transport skids) and other objects, in particular people</li> <li>Reduced resolution for suppressing interference objects (e.g., cables)</li> </ul> </li> <li>Criteria                             <ul style="list-style-type: none"> <li>Max. up 5 different objects</li> <li>Defined by minimum and maximum size</li> <li>Customizing possible</li> <li>Size and distance between the objects constant on passing through the protective field</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>High potential savings, as no additional hinged flaps required, wiring effort and downtimes are minimized</li> <li>High availability – no interruption of production due to faulty muting lamps, incorrectly adjusted muting sensors or override cycles</li> <li>Fewer components, straightforward mounting, no additional muting sensors, only one sensor pair (ESPE)</li> <li>The protective field can be used as a parking position for skids</li> <li>No muting, always active, a high level of safety</li> <li>ATEX II 3G/3D certified</li> </ul>	F-205
Goods detection	Type 4	Transporting items on transport aids, e.g., a pallet load secured with shrink film  C4000 Palletizer Standard	<ul style="list-style-type: none"> <li>Function                             <ul style="list-style-type: none"> <li>Objects with a closed optical contour pass through the protective field of the horizontally mounted safety light curtain. The sensor monitors whether the geometry is closed.</li> </ul> </li> <li>Criteria                             <ul style="list-style-type: none"> <li>One object with closed optical contour with gaps of &lt; 11 mm</li> <li>Minimum width 500 mm</li> <li>Max. protective field length 150 mm</li> <li>Changing batches are accepted automatically; they shall not change during passage</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>High availability – no interruption of production due to faulty muting lamps, incorrectly adjusted muting sensors or override cycles</li> <li>Fewer components, straightforward mounting, no additional muting sensors, only one sensor pair (ESPE)</li> <li>The protective field can be used as a parking position for skids</li> <li>No muting, always active, a high level of safety</li> <li>ATEX II 3G/3D certified</li> </ul>	F-192
Pallet detection	Type 4	Transporting items on/in transport aids, e.g., pallets or mesh crates  C4000 Palletizer Advanced	<ul style="list-style-type: none"> <li>Function                             <ul style="list-style-type: none"> <li>Pallet detection by differentiation between several objects in the protective field plane (e.g., feet on pallets or mesh crates or wheels on a trolley) and people</li> <li>Automatic teach-in of object sizes</li> <li>Reduced resolution for high availability in case of film leftovers, splinters or straps</li> </ul> </li> <li>Criteria                             <ul style="list-style-type: none"> <li>Max. 2 to 5 objects in protective field at same time (system dependent)</li> <li>Max. width of each object 240 mm</li> <li>Size and distance between the objects constant on passing through the protective field</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>High availability – no interruption of production due to faulty muting lamps, incorrectly adjusted muting sensors or override cycles</li> <li>Fewer components, straightforward mounting, no additional muting sensors, only one sensor pair (ESPE)</li> <li>The protective field can be used as a parking position for skids</li> <li>Object entry monitoring for highly available output monitoring: semi-wrapped pallets, CHEP pallets</li> <li>No muting, always active, a high level of safety</li> <li>ATEX II 3G/3D certified</li> <li>Free length detection: first and last beam may be interrupted at the same time during operation (software SW06.20 or higher)</li> </ul>	F-192

■ Cost-effectiveness ■ Safety ■ Notes

Principle	Type acc. to IEC 61496	Typical application/sensor	Function and criteria	Advantages, safety and notes	Page
Coil detection	Type 4	<p>Transporting items, e.g., paper or coils of steel</p>  <p>C4000 Fusion, diagonally arranged</p>	<ul style="list-style-type: none"> <li><b>Function</b> Objects with closed optical contours are transported through the protective field of the safety light curtain. During this process the sensor monitors whether the optical geometry is closed and whether there is only one item.</li> <li><b>Criteria</b> <ul style="list-style-type: none"> <li>One object with closed optical contour</li> <li>Max. height 1500 mm</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Space saving due to almost vertical mounting</li> <li>Straightforward mounting, no additional muting sensors, only one sensor pair (ESPE)</li> <li>No muting, always active, as a result a high level of safety</li> <li>No gaps allowed in the object</li> <li>Lateral shadow areas must also be protected</li> </ul>	F-205
On-site muting IP 65	Type 4	<p>Transporting items on transport aids or directly on conveyor equipment such as conveyor belts, chain or roller conveyors</p>  <p>M4000 Advanced M4000 Advanced A/P M4000 Advanced Curtain with UE403</p>	<ul style="list-style-type: none"> <li><b>Function</b> The item transported is detected using additional muting sensors for as long as it is transported through the protective field of the photoelectric safety switch. A differentiation is made between man and material due to the arrangement and detection principle of the muting sensors.</li> <li><b>Criteria</b> <ul style="list-style-type: none"> <li>Continuous detection of the item transported as long as it is transported through the protective field of the photoelectric safety switch</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Highly flexible solution in relation to the shape of the item transported and the settings for the muting configurations</li> <li>Minimization of wiring effort due to on-site IP 65 muting solution. Muting signals connected locally</li> <li>High resolution of the M4000 Advanced Curtain variants reduces safety distance</li> <li>Increased safety, e.g., due to defined beams that remain permanently active (partial blanking instead of muting)</li> <li>Precise adjustment and correct selection of the detection principle for the muting sensors required</li> <li>Additional mechanical protection such as hinged doors may be necessary</li> </ul>	F-68 G-2
Central muting IP 20	Type 2 Type 3 Type 4	<p>Transporting items on transport aids or directly on conveyor equipment such as conveyor belts, chain or roller conveyors</p>  <p>AOPD with Flexi Classic</p>	<ul style="list-style-type: none"> <li><b>Function</b> The item transported is detected using additional muting sensors for as long as it is transported through the protective field of the safety sensor. A differentiation is made between man and material due to the arrangement and detection principle of the muting sensors.</li> <li><b>Criteria</b> <ul style="list-style-type: none"> <li>Continuous detection of the item transported for as long as it is transported through the protective field of the safety sensor</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Complete safety control logic, e.g., for end of line packaging applications, in an IP 20 control cabinet module (Flexi Classic)</li> <li>Space-saving 22 mm width of the Flexi Classic</li> <li>Use of any AOPD (type 2 and 4) and AOPDDR (type 3)</li> <li>All cables must be laid to a central control cabinet</li> </ul>	O-2
Protective fields with adaptable openings		<p>Transporting items on transport aids or directly on conveyor equipment such as conveyor belts, chain or roller conveyors</p>  <p>S3000</p>	<ul style="list-style-type: none"> <li><b>Function</b> An appropriate "opening" in the protective field of the safety laser scanner is activated by the item transported using a safe controller or standard sensors before the vertical protective field is reached. Defined areas or parts of the machine around the protective field are continuously monitored as a reference. In this way tampering or incorrect adjustment is detected.</li> <li><b>Criteria</b> <ul style="list-style-type: none"> <li>Switching of the "openings" by safe controller or using standard sensors</li> <li>Maximum 7 different "openings"</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Very flexible solution in relation to the shape of the item transported/protective field</li> <li>No additional sensors necessary with safe controller</li> <li>Straightforward mounting, as hinged doors are not necessary, less mechanics and wiring effort</li> <li>No muting, always active, as a result a high level of safety. If there is no transported item, the protective field is completely closed</li> <li>Automatic checking for correct controller signals</li> <li>Response time greater than for photoelectric safety switches or multiple light beam safety devices</li> </ul>	D-3

■ Cost-effectiveness ■ Safety ■ Notes

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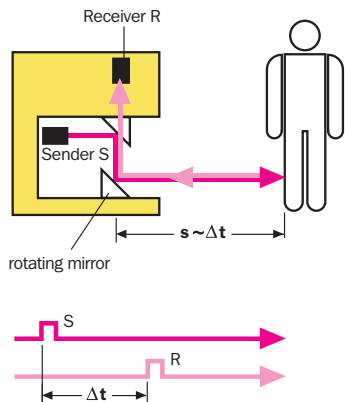
# Safety laser scanners and laser scanners

## Principle of operation of laser scanners

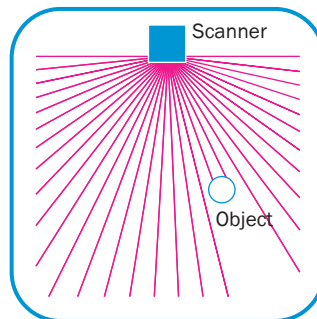
Laser scanners are compact systems that scan their surroundings with a beam ("optical radar"). If the emitted light pulses hit an object, the light is reflected and detected in the laser scanner's receiver. The time between the emission of a light pulse and the reception of the reflection represents the distance between the laser scanner and object (time-of-flight measurement). An internal rotating mirror "moves" the light pulses in a circle to produce 2-dimensional scanning.

Monitored areas can be defined within the field of view (scanning angle) and the device-specific scanning range of a laser scanner. If an object is detected in a monitored area, this situation is indicated by the laser scanner using 2 switching outputs (safe "stop" signal to the machine).

D



Laser scanner principle of operation



Fan-shaped scanning of the surroundings

## Use of laser scanners

Laser scanners are used for area monitoring (hazardous area protection), hazardous point protection and access protection. A differentiation is made between:

- Stationary applications
  - Horizontal applications: e.g., pipe bending machines, machining centers, robot cells, press return area, etc.
  - Vertical applications: Entry/exit, hand protection

- Mobile applications
  - Monitoring the movement of AGVs (automated guided vehicles), narrow aisle stackers, etc.

## Advantages of SICK safety laser scanners

### Additional functions for plant and machine control

- Switchable monitored areas in accordance with the current process phase
- Monitoring external switching elements/contactors (EDM) saves costs and effort in machine control
- High-current outputs for directly operated switching elements (contactors), making conversion of the switching signals using relay interfaces, etc., unnecessary
- Measured data of the surroundings as well as reflector detection to support vehicle steering (AGV). Only one sensor for safety and control
- Integrated restart interlock (RES) minimizes the effort in the machine control
- Enhanced EFI with Flexi Soft controller - up to 4 scanners (2 x 2 host/guest)

### Product range

- A very wide range of application requirements can be addressed with a compatible product family, thus minimizing stock-keeping and investment costs

### Experience

- Proven in use
- The highest quality standards guarantee stable serial production
- Consultation and service expertise

## Services for productive safety

With services tailored specifically to your needs, SICK offers all-encompassing support for the safety of your machine or system.

Address productivity and cost-effectiveness from the start: From selection and planning, through commissioning and inspection, to maintenance and modernization.

→ For information about services please refer to chapter B



Safety application	Scanning range (m)	Scanning angle (°)	Switchable field sets <sup>1)</sup>	Incremental encoder connections	Static control inputs	Functions						Product	Page
						External device monitoring (EDM)	Host/guest operation	Safe device communication via EFi/SDL	Direct integration into bus systems	Reflector mark detection	Expanded measured data output		
	4 / 5.5 / 7	190	8	2	4	✓	✓	✓	–	–	✓	S3000 Professional <sup>2)</sup>	D-3
			4	–	2	✓	✓	✓	–	–	✓	S3000 Advanced <sup>2)</sup>	D-11
			1	–	–	✓	✓	✓	–	–	✓	S3000 Standard <sup>2)</sup>	D-19
			8	–	–	✓	✓	✓	–	–	✓	S3000 Remote <sup>3)</sup>	D-27
			8	2	4	✓	✓	✓	–	✓	✓	S3000 Professional CMS <sup>2)</sup>	D-34
			8	–	–	–	–	–	✓	–	–	–	S3000 PROFINET IO Prof.
	7	180	4	–	–	–	–	–	✓	–	–	S3000 PROFINET IO Adv.	D-46
			4	–	2	–	✓	✓	–	–	–	S3000 Cold Store <sup>2)</sup>	D-51
	2	270	8	2	2	✓	✓	✓	–	–	–	S300 Expert <sup>2)</sup>	D-58
			4	2	2	✓	✓	✓	–	–	–	S300 Professional <sup>2)</sup>	D-67
			2	–	1	✓	✓	✓	–	–	–	S300 Advanced <sup>2)</sup>	D-77
			1	–	–	✓	✓	✓	–	–	–	S300 Standard <sup>2)</sup>	D-86
			4	2	2	✓	✓	✓	–	✓	✓	S300 Professional CMS <sup>2)</sup>	D-94
			1.5	–	–	✓	–	–	–	–	–	–	S200
	–	270	1	–	–	–	–	–	–	–	–	S100 Standard <sup>4)</sup>	D-113
			16	–	4	–	–	–	–	–	–	–	S100 Professional <sup>4)</sup>

<sup>1)</sup> Field set comprised of protective field and warning field

<sup>2)</sup> Special features of the S3000 and S300 product families on page D-2

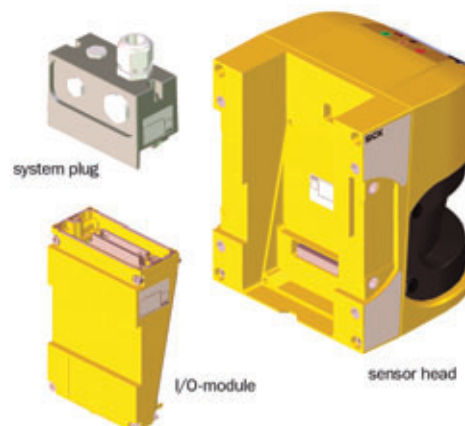
<sup>3)</sup> S3000 Remote can only be used in conjunction with another S3000 or a Flexi Classic or Flexi Soft safety controller

<sup>4)</sup> S100 Standard and S100 Professional are not approved for the protection of people, maximum switching field range 10 m, CANopen interface integrated

## Special features of safety laser scanners and laser scanners

### S3000 – The modular system

- Modular concept
- Largest achievable scanning range is 7 m for safety applications
- Configuration memory in the system plug
- Selectable resolution makes it possible to adapt the devices to a very wide range of application requirements
- Certified for vertical use for access control or entry/exit applications, as well as hand protection
- 7-segment display
- Integrated external device monitoring (EDM)
- Safe integration in bus systems
- Up to 8 switchable protective/warning fields (field sets)
- Formation of host/guest systems with S3000/S300
- Direct connection of incremental encoders
- Measured data output via RS-422 interface
- Reflector mark detection



Modular concept

### S300/S200 – Compact. Flexible. Intelligent.

- Extremely compact
  - S300 is the first small safety laser scanner in the world
  - S200 – the first laser scanner for cat. 2 applications
- 8 m warning field and 2 m protective field
- 270° scan angle
- Configuration memory in the system plug
- Selectable resolution makes it possible to adapt the devices to a very wide range of application requirements
- Certified for vertical use for access control or entry/exit applications, as well as hand protection
- 7-segment display
- Integrated external device monitoring (EDM)
- Safe integration in bus systems
- Up to 8 switchable protective/warning fields (field sets)
- Formation of host/guest systems with S300/S3000
- Direct connection of incremental encoders
- Stand-by input
- RS-422 data interface



### S100 – The compact all around solution

- Non-safety rated device
- Switching field range 10 m
- 270° scan angle
- Selectable resolution
- Up to 8 field sets
- Configuration connection
- 7-segment display
- Stand-by input
- CANopen interface integrated





## Technical data overview

Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Warning field range	49 m (20 m at 20 % reflectivity)
Number of field sets	8
Scan angle	190°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Response time	60 ms, 120 ms

## Product description

The S3000 Professional can be used for a wide range of applications for the protection of machines and systems. The field sets can be conveniently defined using a PC or laptop.

- For complex applications with up to 8 protective fields/warning fields
- Static and dynamic protective field switching

- Incremental encoder connections
- Possibility of connecting two S3000 units to form a single system
- Uniform "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

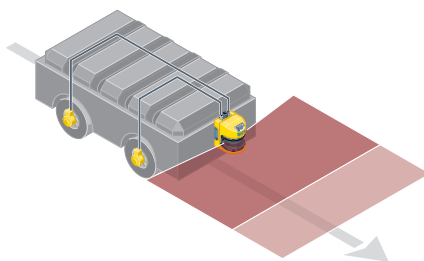
Combined with SICK safe control solutions

→ For more combinations, see annex

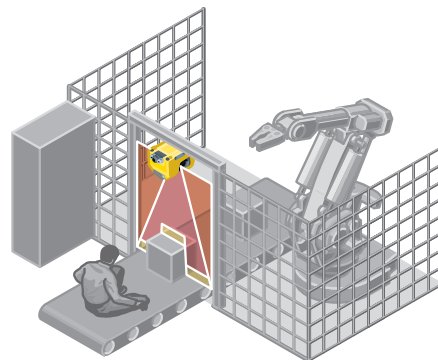
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

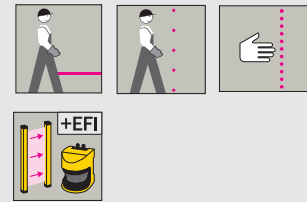
- Automated Guided Vehicles (AGVs)
- Production lines
- Machining centers
- Entry/exit stations (gates)
- Robot cells
- Narrow aisle vehicles



Speed-dependent vehicle monitoring



Vertical access protection (entry/exit) with "contour as reference"



- Modular concept
- Scanning range 4 m, 5.5 m or 7 m
- Configuration memory
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)



Further information	Page
→ Ordering information	D-4
→ Technical specifications	D-4
→ Dimensional drawings	D-6
→ Connection diagrams	D-7
→ Accessories	D-9
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S3000 systems:

- Sensor head with I/O module mounted
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "Important information"

The system plug has to be ordered separately!

System part	Protective field range	Type	Part no.
Sensor head with I/O module	4 m	S30A-4011DA	1028936
	5.5 m	S30A-6011DA	1019600
	7 m	S30A-7011DA	1023892
Sensor head	4 m	Sensor head short range	2034999
	5.5 m	Sensor head medium range	2022972
	7 m	Sensor head long range	2026747
I/O module	-	I/O module Professional	2022827

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 and 1040.11, DIN EN 60825:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$7.67 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Front screen material	Polycarbonate
Front screen surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	155 mm x 185 mm x 160 mm
Weight	3.3 kg

## Functional data

Scan angle	190°
Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	60 ms, 120 ms <sup>1)</sup>
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Angular resolution	0.5°, 0.25°, depending on range and resolution
Protective field supplement	100 mm
Warning field range	49 m (20 m at 20 % reflectivity)
Distance measuring range	49 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

<sup>1)</sup> Depending on basic response time and multiple sampling

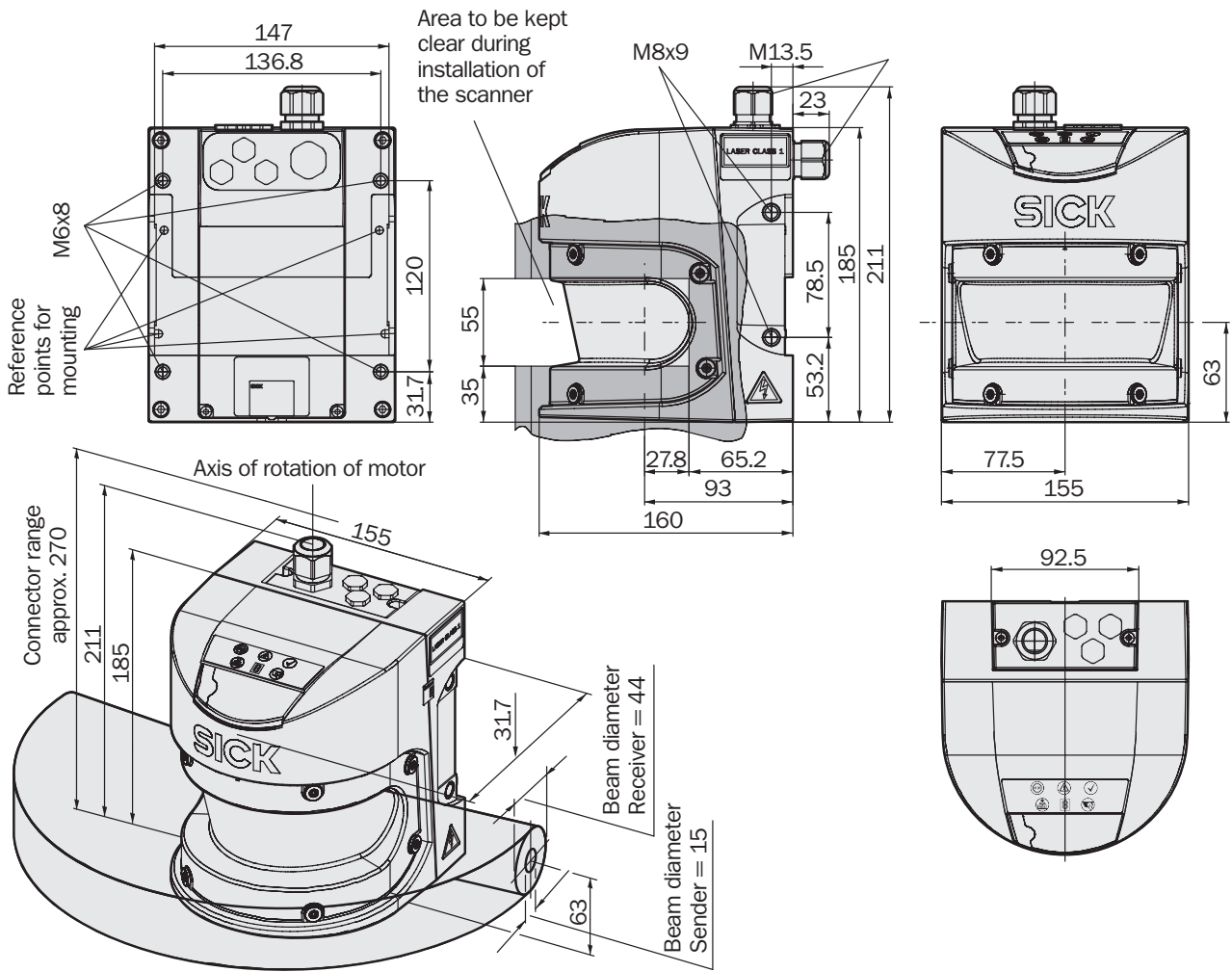
## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 28.8 V DC)
Power consumption	0.8 A (24 V DC) 2.3 A <sup>1)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Static switching signals	2, 4
Dynamic encoder signals (incremental encoder)	2
Number of outputs	
Safety outputs (OSSD)	2 x 500 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	9.6 kBaud, 19.2 kBaud, 38.4 kBaud
Data interface	RS-422 (≤ 500 kBaud)
Safe device communication via EFI/SDL	
Transmission rate	≤ 500 kBaud
Cable length	50 m
Connection conductor cross-section	0.34 mm <sup>2</sup>

<sup>1)</sup> Including maximum output load

# Dimensional drawings

D

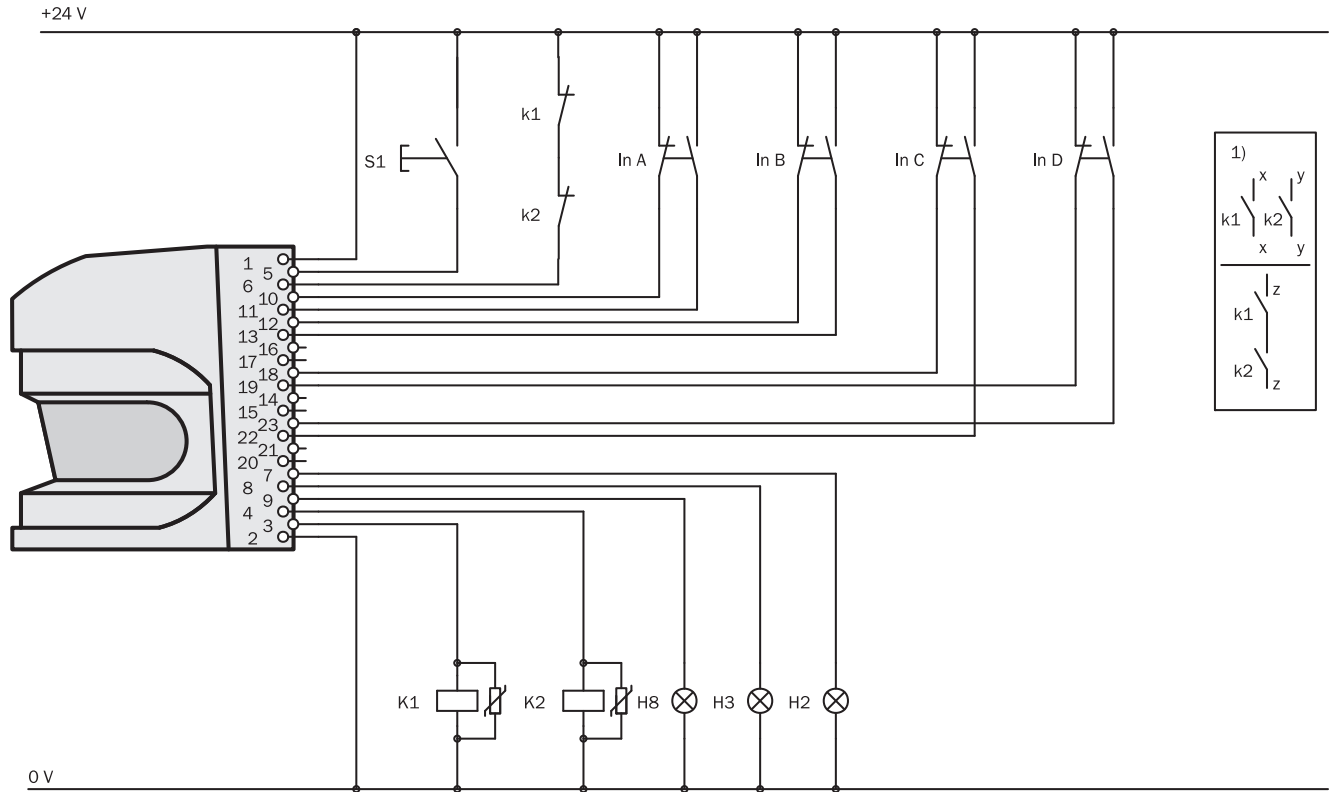


Dimensions in mm

# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## Protective field switching with four static inputs



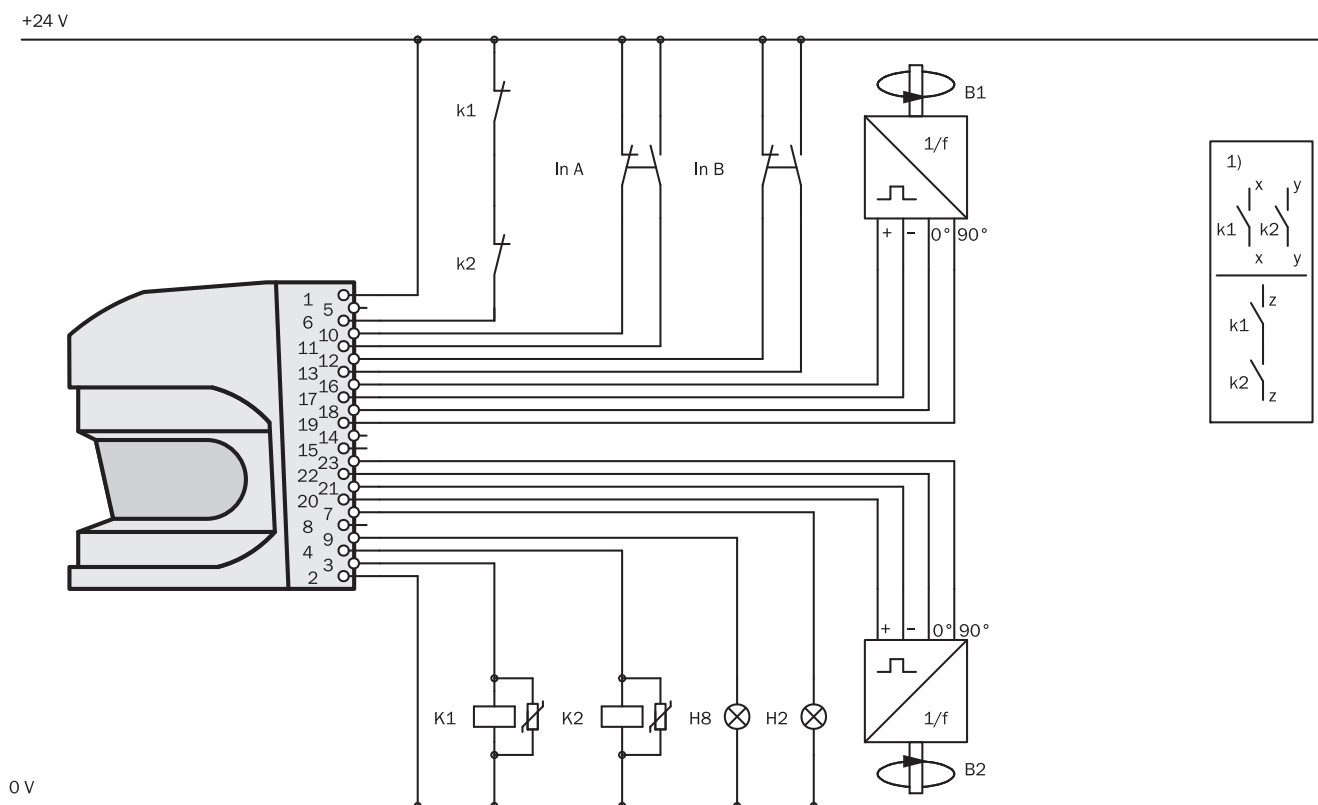
- S3000 Professional in conjunction with relays/contactors
- Operating mode: with restart interlock and external device monitoring (EDM)

- Static protective field switching by means of the control inputs A, B, C and D

D

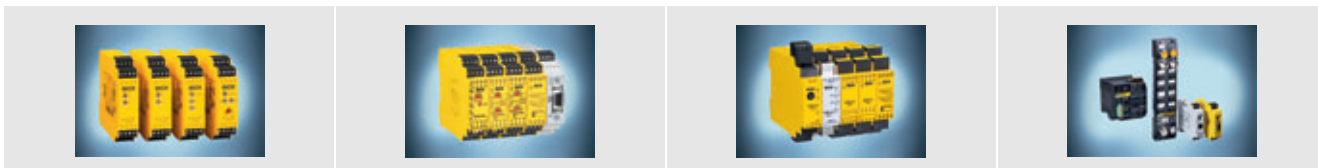
Protective field switching with static and dynamic inputs

D



- S3000 Professional in conjunction with relays/contactors
- Operating mode: without restart interlock with external device monitoring (EDM)
- Dynamic protective field switching using B1 and B2 as well as static protective field switching using the control inputs A and B





sens:Control – safe control solutions







Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	Non-adjustable	–	Mounting kit 1	2015623
			Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1	Mounting kit 2	2015624
		Mounting at the rear or below on wall, floor or machine	Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1 and 2	Mounting kit 3	2015625
	Mounting bracket, rugged design, with protective cover	Floor mounting	Height adjustment possible	–	Mounting bracket	7087514


### System plugs

Figure	Direction of cable outlet	Usage	Connection type	Number of cores	Cable length	Type	Part no.
	Upward	Not for use with incremental encoders	Without cable	–	–	SX0A-A0000B	2023797
			Pre-assembled	17	5 m	SX0A-B1705B	2027174
					10 m	SX0A-B1710B	2027175
		20 m			SX0A-B1720B	2027816	
		For use with incremental encoders	Without cable	–	–	SX0A-A0000D	2023310
			Pre-assembled	13	5 m	SX0A-B1305D	2027176
	10 m				SX0A-B1310D	2027177	


### Connecting cables

Figure	Cable type	Number of cores	Type	Part no.
	By the meter	17	Connection cable	6025730
		13	Connection cable	6025729
	By the meter	–	EFI connection cable	6029448

### SDL connection cables


Figure	Note	Direction of cable outlet	Connection type	Number of cores	Cable length	Part no.
	For the connection of safety bus modules to S3000	Straight	Interconnection plug M23 x 12	12	2.5 m	2029337
					5 m	2029338
					10 m	2029339
					15 m	2029340

**Cable glands**


Figure	Usage	Size of the cable gland	Permissible cable diameter	Description	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	For quick and easy shield connection	5314772
				-	5308757
	For system plug S3000	M20	7 mm ... 12 mm	-	5308762
			10 mm ... 14 mm	For quick and easy shield connection	5314774
				-	5318531

D

**Configuration connection cables**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

Figure	Description	Items supplied	Type	Part no.
	Front screen replacement kit	With replacement seal and screws	Front screen replacement kit	2027180
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353



## Technical data overview

Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Warning field range	49 m (20 m at 20 % reflectivity)
Number of field sets	4
Scan angle	190°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Response time	60 ms, 120 ms

## Product description

S3000 Advanced safety laser scanners are used for the horizontal and vertical protection of hazardous areas, hazardous points and accesses.

- For complex applications with up to 4 protective fields/warning fields
- Static protective field switching

- Possibility of connecting two S3000 units to form a single system
- Uniform "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

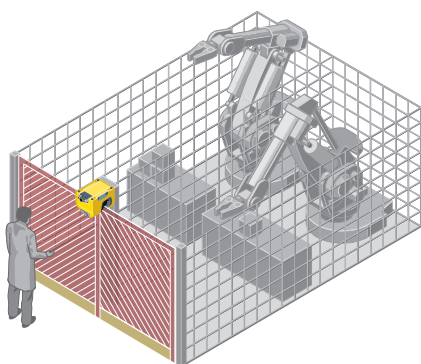
Combined with SICK safe control solutions

→ For more combinations, see annex

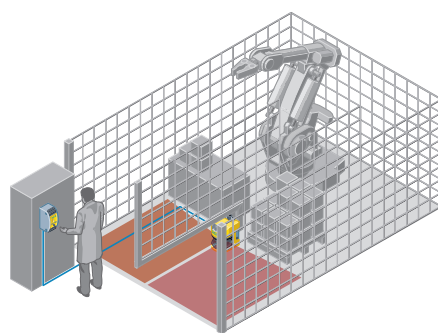
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

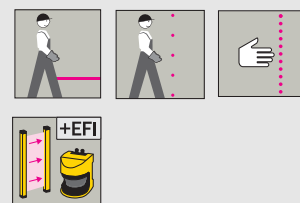
- Automated Guided Vehicles (AGVs)
- Production lines
- Machining centers
- Entry/exit stations (gates)
- Robot cells
- Narrow aisle vehicles



Access protection on a robot cell with several working areas with "contour as reference"



Protection of two separate working areas with one S3000 and a SICK safety controller



- Modular concept
- Scanning range 4 m, 5.5 m or 7 m
- Configuration memory
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)



Further information	Page
→ Ordering information	D-12
→ Technical specifications	D-12
→ Dimensional drawings	D-14
→ Connection diagrams	D-15
→ Accessories	D-17
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S3000 systems:

- Sensor head with I/O module mounted
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "Important information"

The system plug has to be ordered separately!

System part	Protective field range	Type	Part no.
Sensor head with I/O module	4 m	S30A-4011CA	1028935
	5.5 m	S30A-6011CA	1023547
	7 m	S30A-7011CA	1023891
Sensor head	4 m	Sensor head short range	2034999
	5.5 m	Sensor head medium range	2022972
	7 m	Sensor head long range	2026747
I/O module	-	I/O module Advanced	2026802

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 and 1040.11, DIN EN 60825:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$7.67 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Front screen material	Polycarbonate
Front screen surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	155 mm x 185 mm x 160 mm
Weight	3.3 kg

## Functional data

Scan angle	190°
Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	60 ms, 120 ms <sup>1)</sup>
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Angular resolution	0.5°, 0.25°, depending on range and resolution
Protective field supplement	100 mm
Warning field range	49 m (20 m at 20 % reflectivity)
Distance measuring range	49 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

<sup>1)</sup> Depending on basic response time and multiple sampling

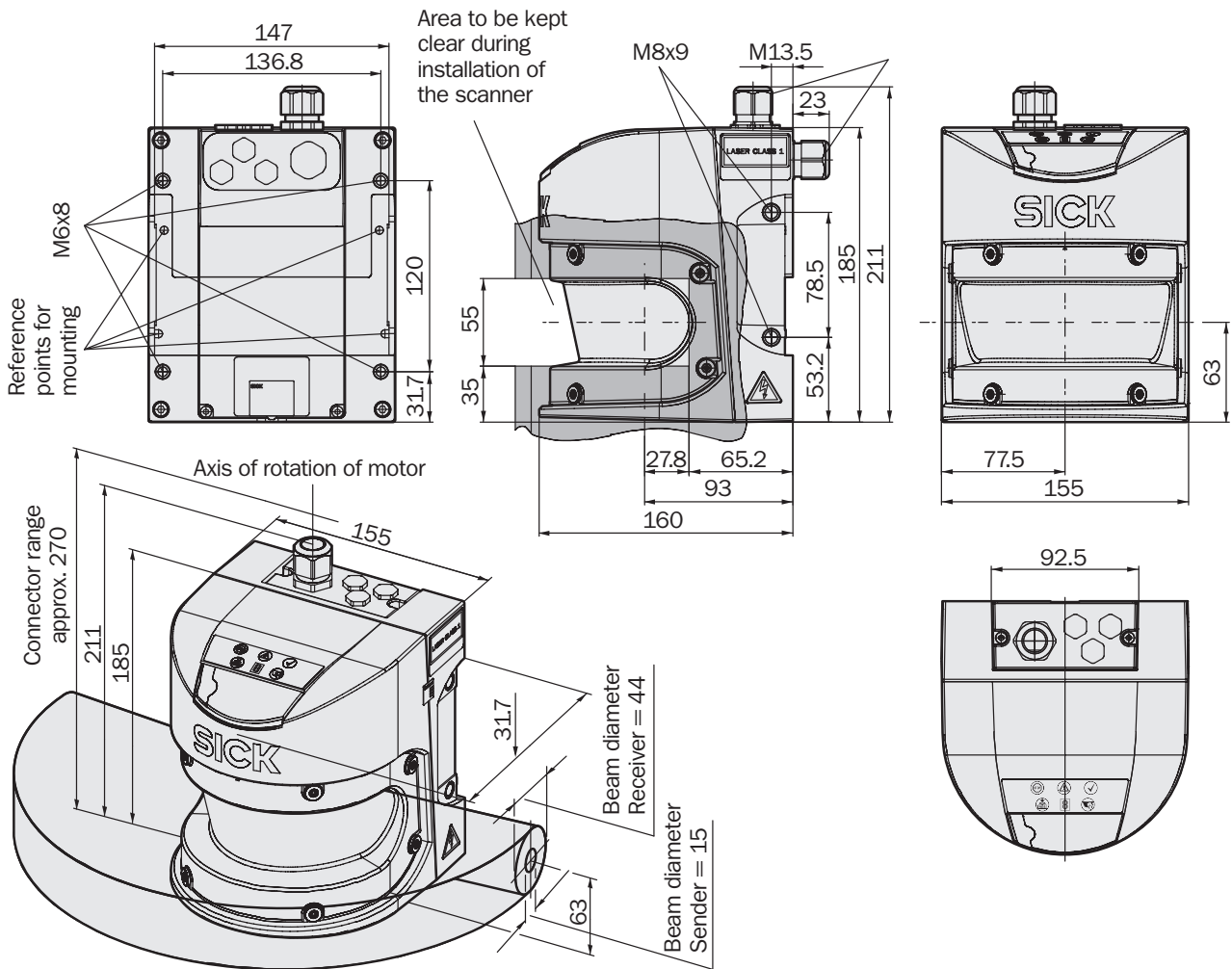
## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 28.8 V DC)
Power consumption	0.8 A (24 V DC) 2.3 A <sup>1)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Static switching signals	2
Number of outputs	
Safety outputs (OSSD)	2 x 500 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	9.6 kBaud, 19.2 kBaud, 38.4 kBaud
Data interface	RS-422 (≤ 500 kBaud)
Safe device communication via EFI/SDL	
Transmission rate	≤ 500 kBaud
Cable length	50 m
Connection conductor cross-section	0.34 mm <sup>2</sup>

<sup>1)</sup> Including maximum output load

# Dimensional drawings

D

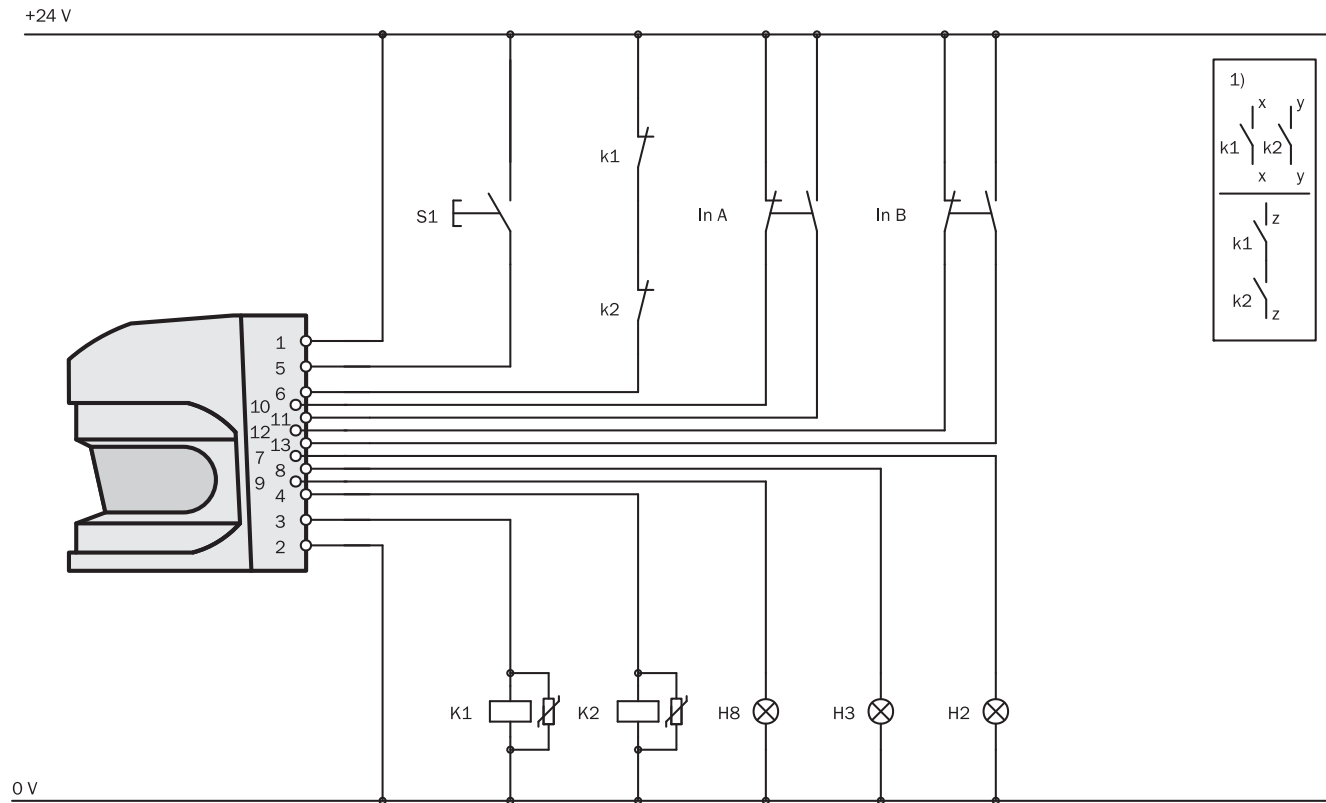


Dimensions in mm

# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## Protective field switching with two static inputs



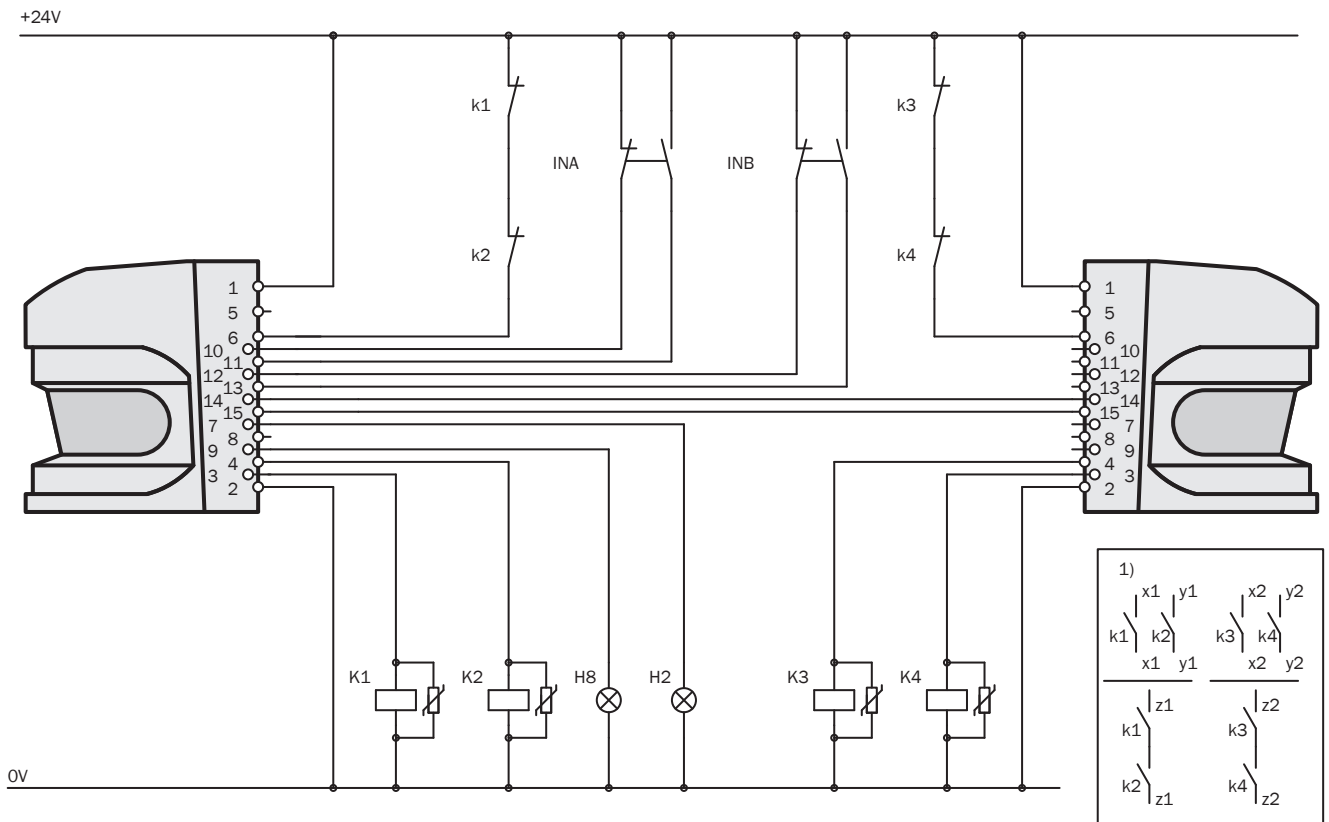
- S3000 Advanced in conjunction with relays/contactors
- Operating mode: with restart interlock and external device monitoring (EDM)

- Protective field switching by means of control inputs A and B

D

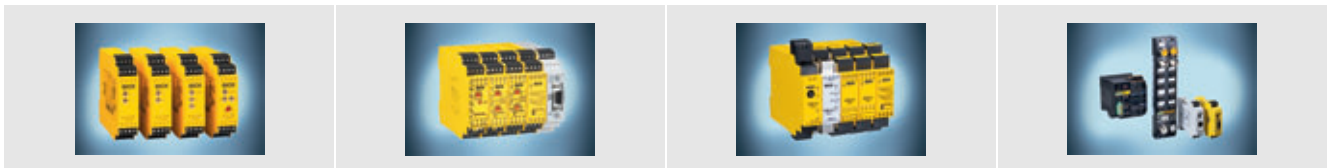
Protective field switching between two S3000s with static inputs

D



- S3000 Advanced with S3000 Advanced in conjunction with relays/contactors
- Protective field switching by means of control input A and control input B on separate OSSD pairs (simultaneous monitoring)
- Operating mode: without restart interlock with external device monitoring (EDM)



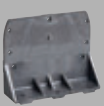

sens:Control – safe control solutions





Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	Non-adjustable	–	Mounting kit 1	2015623
			Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1	Mounting kit 2	2015624
		Mounting at the rear or below on wall, floor or machine	Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1 and 2	Mounting kit 3	2015625
	Mounting bracket, rugged design, with protective cover	Floor mounting	Height adjustment possible	–	Mounting bracket	7087514


### System plugs

Figure	Direction of cable outlet	Usage	Connection type	Number of cores	Cable length	Type	Part no.
	Upward	Not for use with incremental encoders	Without cable	–	–	SX0A-A0000B	2023797
			Pre-assembled	13	5 m	SX0A-B1305B	2027172
					10 m	SX0A-B1310B	2027173
					20 m	SX0A-B1320B	2027815


### Connecting cables

Figure	Cable type	Number of cores	Type	Part no.
	By the meter	13	Connection cable	6025729
		17	Connection cable	6025730
	By the meter	–	EFI connection cable	6029448

### SDL connection cables


Figure	Note	Direction of cable outlet	Connection type	Number of cores	Cable length	Part no.
	For the connection of safety bus modules to S3000	Straight	Interconnectron plug M23 x 12	12	2.5 m	2029337
					5 m	2029338
					10 m	2029339
					15 m	2029340

**Cable glands**


Figure	Usage	Size of the cable gland	Permissible cable diameter	Description	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	For quick and easy shield connection	5314772
				-	5308757
	For system plug S3000	M20	7 mm ... 12 mm	-	5308762
			10 mm ... 14 mm	For quick and easy shield connection	5314774
				-	5318531

D

**Configuration connection cables**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

Figure	Description	Items supplied	Type	Part no.
	Front screen replacement kit	With replacement seal and screws	Front screen replacement kit	2027180
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353



## Technical data overview

Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Warning field range	49 m (20 m at 20 % reflectivity)
Number of field sets	1
Scan angle	190°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Response time	60 ms, 120 ms

## Product description

S3000 Standard safety laser scanners are used for the horizontal and vertical protection of hazardous areas, hazardous points and accesses as well as to protect automated guided vehicles.

- 1 protective and warning field

- Possibility of connecting two S3000 units to form a single system
- Uniform "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

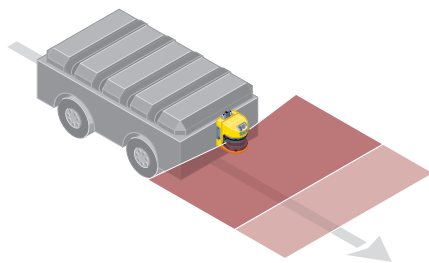
## In-system added value

Combined with SICK safe control solutions

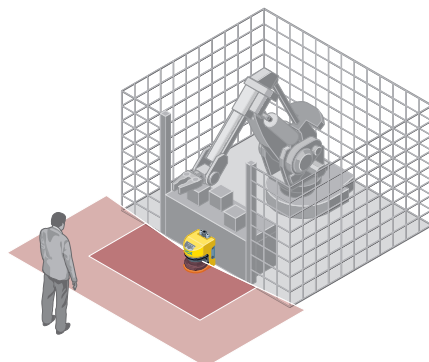
→ For more combinations, see annex

## Applications

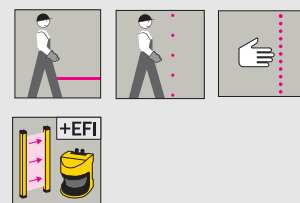
- Automated Guided Vehicles (AGVs)
- Production lines
- Machining centers
- Entry/exit stations (gates)
- Robot cells
- Narrow aisle vehicles



Hazardous area protection on an AGV with one direction of travel



Hazardous area protection on a robot cell



D

- Modular concept
- Scanning range 4 m, 5.5 m or 7 m
- Configuration memory
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)



Further information	Page
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→ Services	B-0

## Ordering information

Delivery S3000 systems:

- Sensor head with I/O module mounted
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "Important information"

The system plug has to be ordered separately!

System part	Protective field range	Type	Part no.
Sensor head with I/O module	4 m	S30A-4011BA	1028934
	5.5 m	S30A-6011BA	1023546
	7 m	S30A-7011BA	1023890
Sensor head	4 m	Sensor head short range	2034999
	5.5 m	Sensor head medium range	2022972
	7 m	Sensor head long range	2026747
I/O module	-	I/O module Standard	2026801

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 and 1040.11, DIN EN 60825:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$7.67 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Front screen material	Polycarbonate
Front screen surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	155 mm x 185 mm x 160 mm
Weight	3.3 kg

## Functional data

Scan angle	190°
Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	60 ms, 120 ms <sup>1)</sup>
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Angular resolution	0.5°, 0.25°, depending on range and resolution
Protective field supplement	100 mm
Warning field range	49 m (20 m at 20 % reflectivity)
Distance measuring range	49 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

<sup>1)</sup> Depending on basic response time and multiple sampling

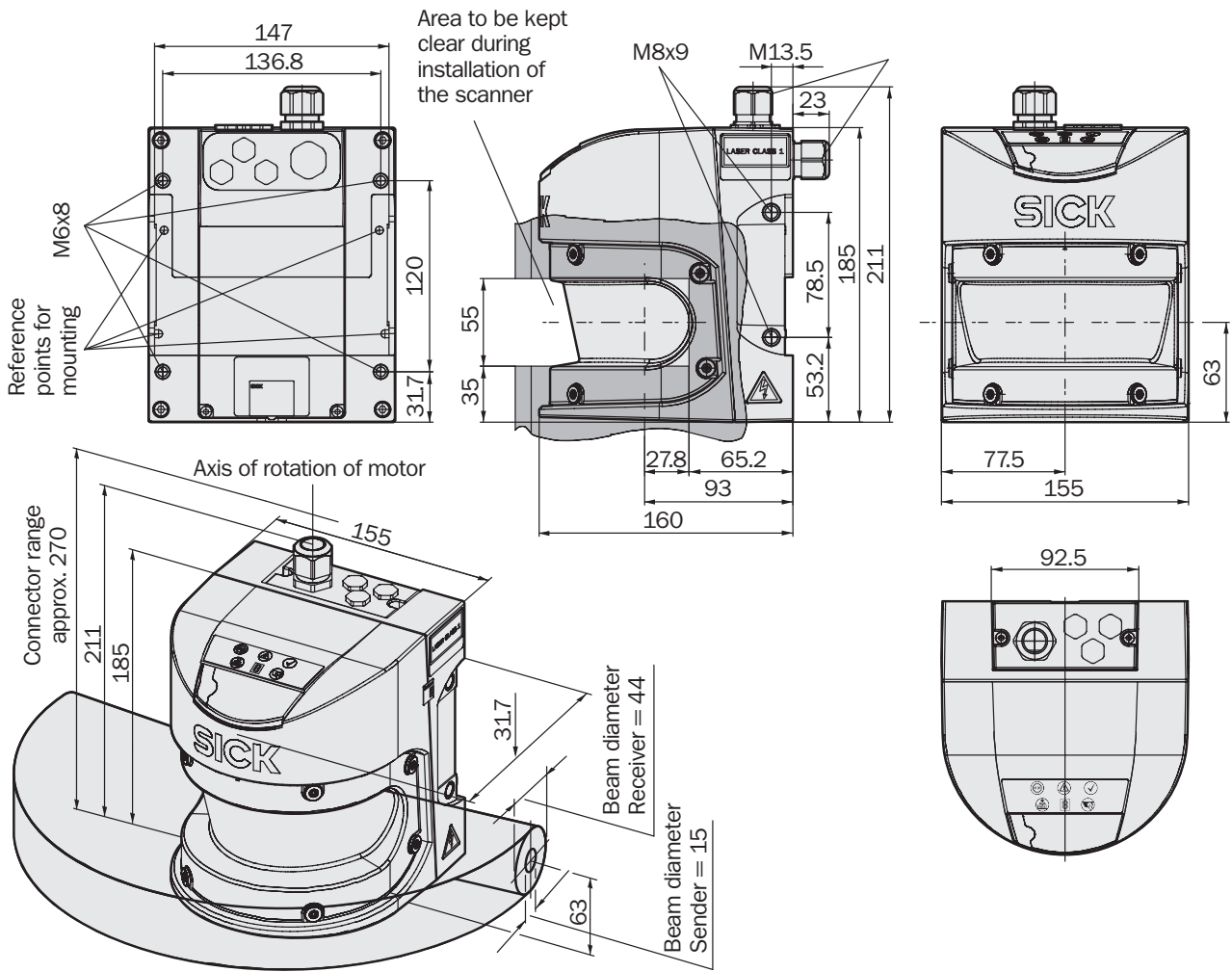
## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 28.8 V DC)
Power consumption	0.8 A (24 V DC) 2.3 A <sup>1)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Number of outputs	
Safety outputs (OSSD)	2 x 500 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	9.6 kBaud, 19.2 kBaud, 38.4 kBaud
Data interface	RS-422 ( $\leq$ 500 kBaud)
Safe device communication via EFI/SDL	
Transmission rate	$\leq$ 500 kBaud
Cable length	50 m
Connection conductor cross-section	0.34 mm <sup>2</sup>

<sup>1)</sup> Including maximum output load

# Dimensional drawings

D

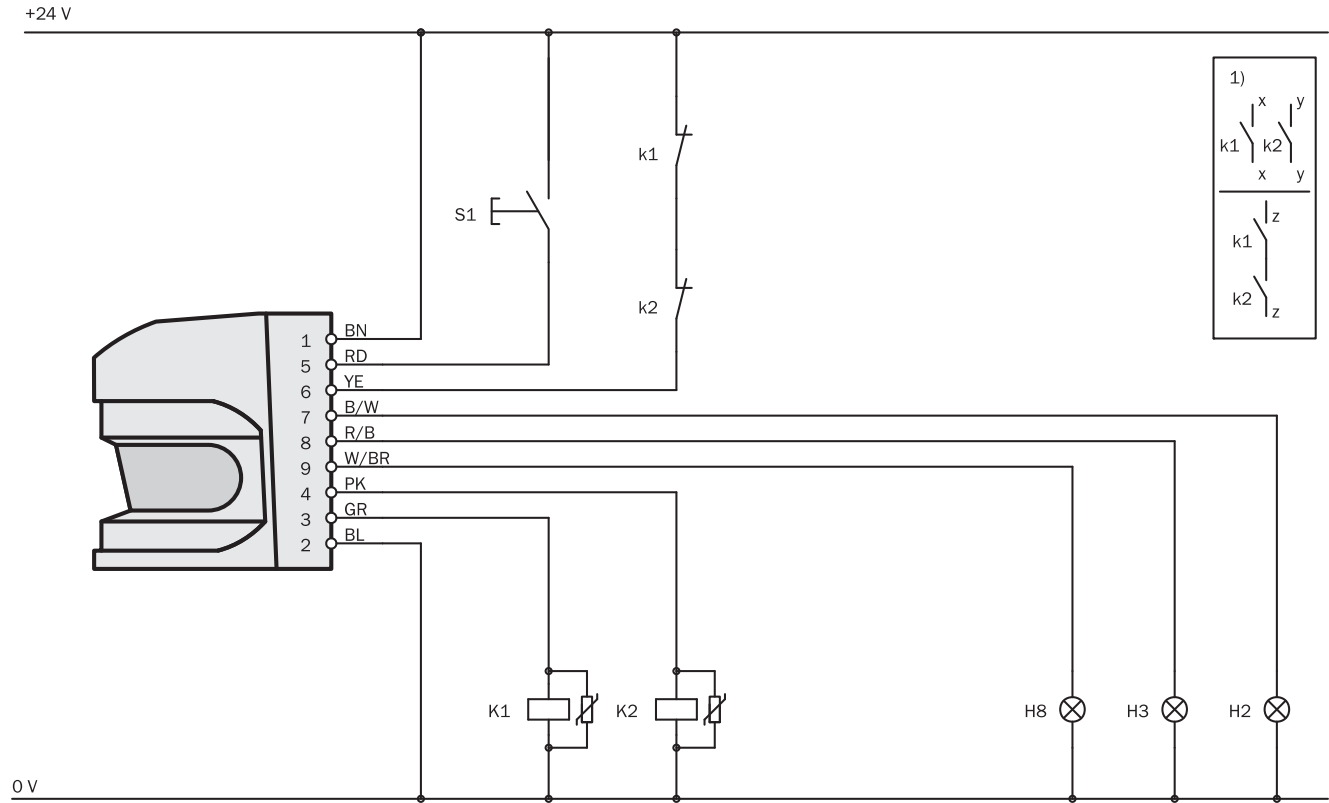


Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### With restart interlock and external device monitoring

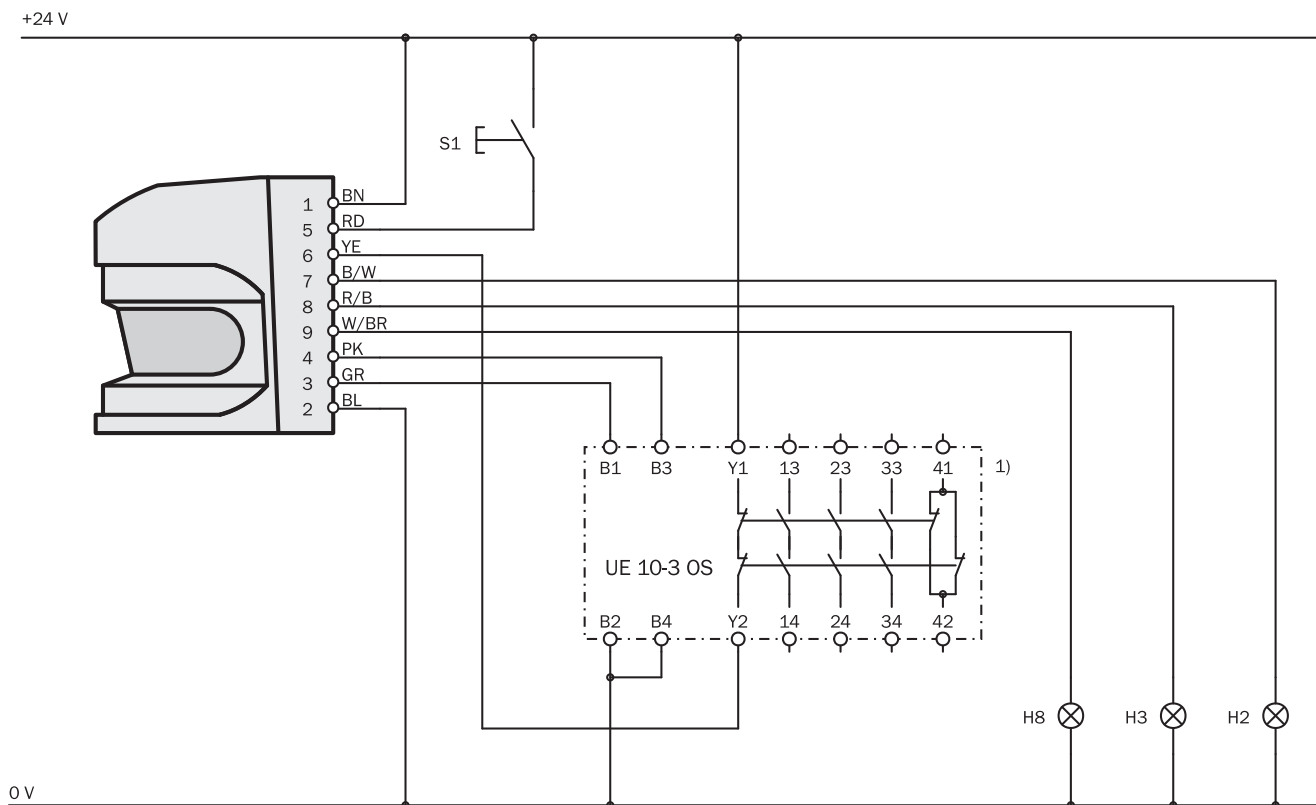


- S3000 Standard in conjunction with relays/contactors
- Operating mode: with restart interlock and external device monitoring (EDM)

D

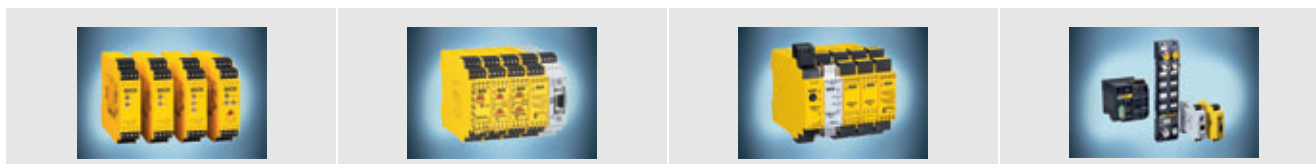
Restart interlock and external device monitoring (EDM) with the UE10-30S safety relay

D



- S3000 Standard in conjunction with UE10-30S
- Operating mode: with restart interlock and external device monitoring (EDM)





sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	Non-adjustable	-	Mounting kit 1	2015623
			Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1	Mounting kit 2	2015624
		Mounting at the rear or below on wall, floor or machine	Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1 and 2	Mounting kit 3	2015625
	Mounting bracket, rugged design, with protective cover	Floor mounting	Height adjustment possible	-	Mounting bracket	7087514


### System plugs

Figure	Usage	Direction of cable outlet	Connection type	Number of cores	Cable length	Type	Part no.
	Not for use with incremental encoders	Backward	Pre-assembled	5	5 m	SX0A-B0905G	2049222
		Upward	Pre-assembled	9	10 m	SX0A-B0910B	2027171
					20 m	SX0A-B0920B	2027814
			Without cable	-	-	SX0A-A0000B	2023797
			Pre-assembled	9	5 m	SX0A-B0905B	2027170


### Connecting cables

Figure	Cable type	Number of cores	Type	Part no.
	By the meter	9	Connection cable	6022651
	By the meter	-	EFI connection cable	6029448

### SDL connection cables


Figure	Note	Direction of cable outlet	Connection type	Number of cores	Cable length	Part no.
	For the connection of safety bus modules to S3000	Straight	Interconnection plug M23 x 12	12	2.5 m	2029337
					5 m	2029338
					10 m	2029339
					15 m	2029340

**Cable glands**


Figure	Usage	Size of the cable gland	Permissible cable diameter	Description	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	For quick and easy shield connection	5314772
				-	5308757
	For system plug S3000	M20	7 mm ... 12 mm	-	5308762
			10 mm ... 14 mm	For quick and easy shield connection	5314774
				-	5318531

D

**Configuration connection cables**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

Figure	Description	Items supplied	Type	Part no.
	Front screen replacement kit	With replacement seal and screws	Front screen replacement kit	2027180
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353



## Technical data overview

**Note:** S3000 Remote can only be used in conjunction with another S3000 or a Flexi Classic or Flexi Soft safety controller

Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Warning field range	49 m (20 m at 20 % reflectivity)
Number of field sets	8, the number of field sets is dependent on the S3000 variant to which the S3000 Remote is connected
Scan angle	190°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Response time	60 ms, 120 ms

## Product description

Autonomous vehicle systems can be protected cost-effectively to suit the specific application using S3000 Remote.

- Up to 8 protective/warning fields
- For complex applications with host/guest combinations

- For 2 directions of travel
- Uniform "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

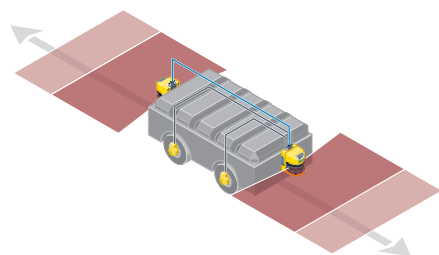
Combined with SICK safe control solutions

→ For more combinations, see annex

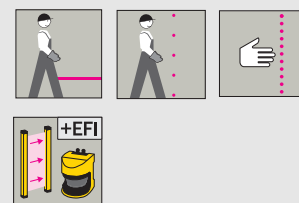
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Automated Guided Vehicles (AGVs)
- Production lines
- Machining centers
- Entry/exit stations (gates)
- Robot cells
- Narrow aisle vehicles



S3000 Professional and S3000 Remote: complex application with bidirectional travel (velocity-dependent protective field/warning field switching using incremental encoders)



- Modular concept
- Scanning range 4 m, 5.5 m or 7 m
- Configuration memory
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)



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→ Connection diagrams	D-31
→ Accessories	D-32
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S3000 systems:

- Sensor head with I/O module mounted
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "Important information"

The system plug has to be ordered separately!

System part	Protective field range	Type	Part no.
Sensor head with I/O module	4 m	S30A-4011EA	1028938
	5.5 m	S30A-6011EA	1023548
	7 m	S30A-7011EA	1023893
Sensor head	4 m	Sensor head short range	2034999
	5.5 m	Sensor head medium range	2022972
	7 m	Sensor head long range	2026747
I/O module	-	I/O module Remote	2026803

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 and 1040.11, DIN EN 60825:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$7.67 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Front screen material	Polycarbonate
Front screen surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	155 mm x 185 mm x 160 mm
Weight	3.3 kg

## Functional data

Scan angle	190°
Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	60 ms, 120 ms <sup>1)</sup>
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Angular resolution	0.5°, 0.25°, depending on range and resolution
Protective field supplement	100 mm
Warning field range	49 m (20 m at 20 % reflectivity)
Distance measuring range	49 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

<sup>1)</sup> Depending on basic response time and multiple sampling

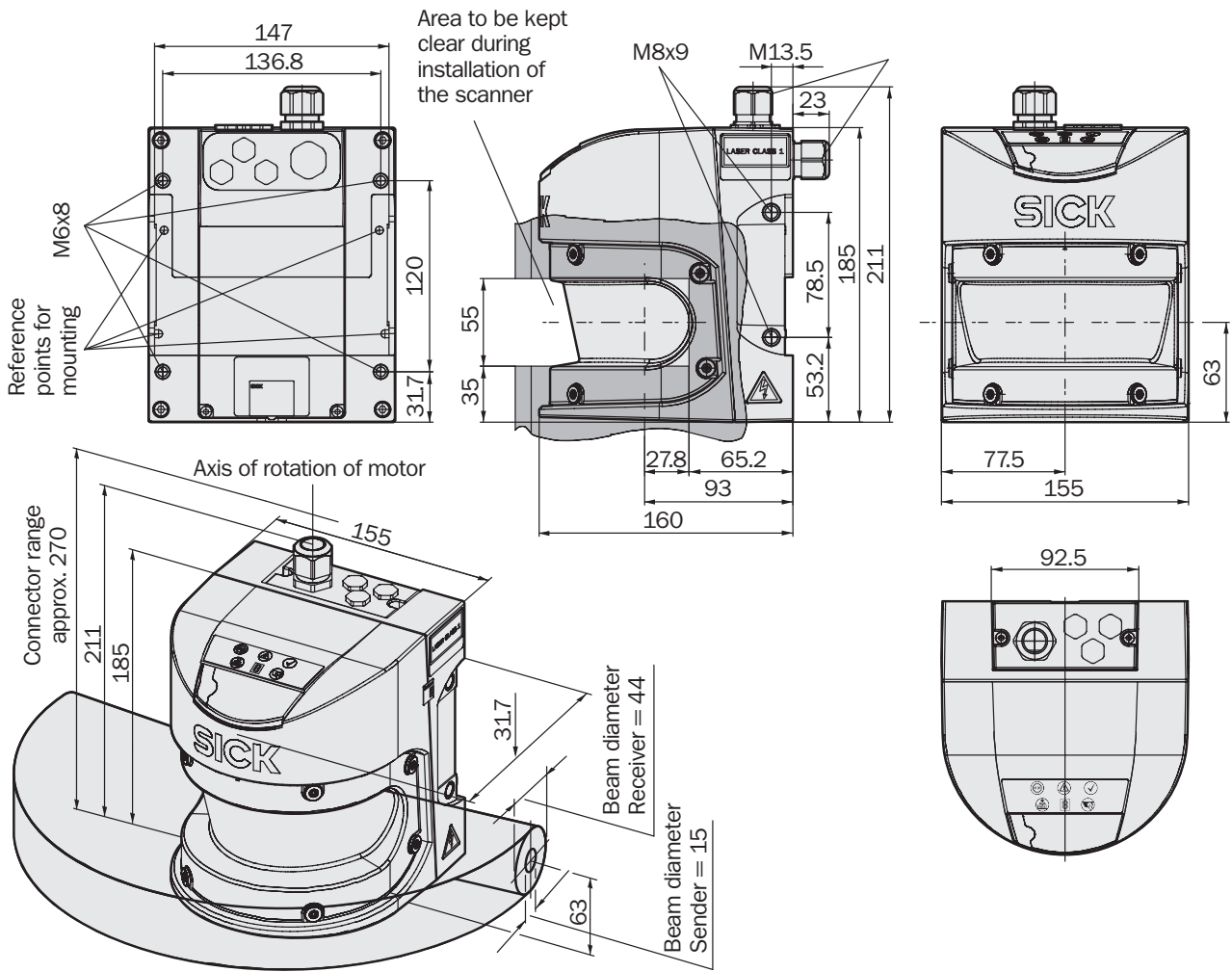
## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 28.8 V DC)
Power consumption	0.8 A (24 V DC) 2.3 A <sup>1)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Number of outputs	
Safety outputs (OSSD)	2 x 500 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	9.6 kBaud, 19.2 kBaud, 38.4 kBaud
Data interface	RS-422 ( $\leq$ 500 kBaud)
Safe device communication via EFI/SDL	
Transmission rate	$\leq$ 500 kBaud
Cable length	50 m
Connection conductor cross-section	0.34 mm <sup>2</sup>

<sup>1)</sup> Including maximum output load

# Dimensional drawings

D

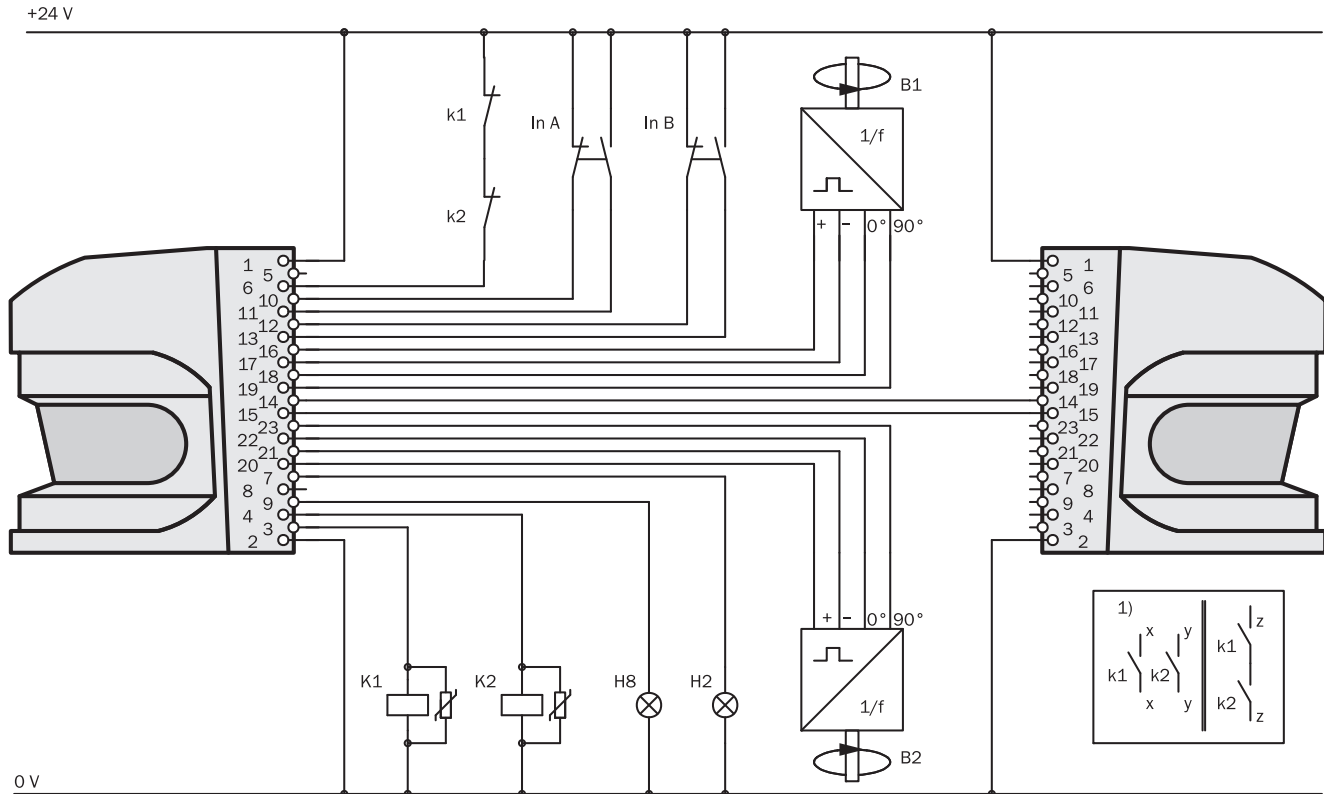


Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

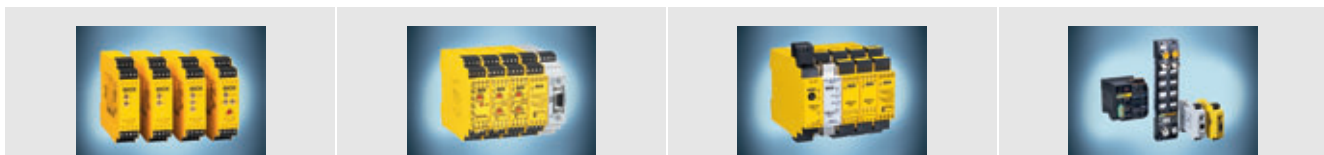
### Protective field switching between two S3000s with static and dynamic inputs



- S3000 Professional (left) and Remote (right) in conjunction with relays/contactors
- Operating mode: without restart interlock with external device monitoring (EDM)

- Direction of travel-dependent dynamic protective field switching by means of B1 and B2 as well as static protective field switching by means of the control inputs A and B with sensor communication via EFI





## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories

### Mounting systems

Figure	Property	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	Non-adjustable	-	Mounting kit 1	2015623
			Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1	Mounting kit 2	2015624
		Mounting at the rear or below on wall, floor or machine	Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1 and 2	Mounting kit 3	2015625
	Mounting bracket, rugged design, with protective cover	Floor mounting	Height adjustment possible	-	Mounting bracket	7087514


### System plug

Figure	Usage	Direction of cable outlet	Connection type	Number of cores	Cable length	Type	Part no.
	Not for use with incremental encoders	Backward	Pre-assembled	5	5 m	SX0A-B0905G	2049222
		Upward	Without cable	-	-	SX0A-A0000B	2023797
			Pre-assembled	9	5 m	SX0A-B0905B	2027170
				9	10 m	SX0A-B0910B	2027171
					20 m	SX0A-B0920B	2027814


### Connecting cable

Cable length	Type	Part no.
By the meter	EFI connection cable	6029448


### SDL connection cables

Figure	Note	Direction of cable outlet	Connection type	Number of cores	Cable length	Part no.
	For the connection of safety bus modules to S3000	Straight	Interconnectron plug M23 x 12	12	2.5 m	2029337
					5 m	2029338
					10 m	2029339
					15 m	2029340


## Cable glands

Figure	Usage	Size of the cable gland	Permissible cable diameter	Description	Part no.
	For EFL connections	M12	3 mm ... 6.5 mm	For quick and easy shield connection	5314772
				-	5308757
	For system plug S3000	M20	7 mm ... 12 mm	-	5308762
			10 mm ... 14 mm	For quick and easy shield connection	5314774
				-	5318531

## Configuration connection cables

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


## Configuration software

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

## Cleaning agent

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

## Other

Figure	Description	Items supplied	Type	Part no.
	Front screen replacement kit	With replacement seal and screws	Front screen replacement kit	2027180
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353



D

- Modular concept
- Scanning range 4 m, 5.5 m or 7 m
- Configuration memory
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)



## Technical data overview

Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Warning field range	49 m (20 m at 20 % reflectivity)
Number of field sets	8
Scan angle	190°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Response time	60 ms, 120 ms

## Product description

With the S3000 Professional CMS (Contour Measurement and Safety), it is possible for the first time to combine the protection of people and the acquisition of surrounding contours. This system opens up new ways to achieve your objectives in the logistics and materials handling market.

- Personnel protection and acquisition of the surrounding contour in one scanner
- Measured data output via RS-422 interface in real-time
- Reflector mark detection up to 30 m

- Velocity transfer for odometry
- 8 switchable protective/warning fields
- Static and dynamic protective field switching
- Incremental encoder connections
- Possibility of connecting two S3000 units to form a single system
- Uniform "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

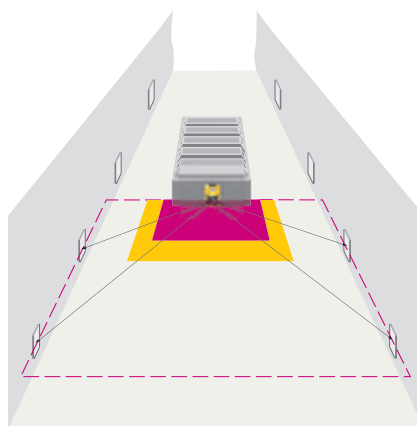
Combined with SICK safe control solutions

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Automated Guided Vehicles (AGVs)



Personnel protection and acquisition of the surrounding contour with integrated reflector detection

Further information	Page
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→ Connection diagrams	D-38
→ Accessories	D-39
→ Systematic safety	A-0
→ Services	B-0



## Ordering information

Delivery S3000 systems:

- Sensor head with I/O module mounted
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "Important information"

The system plug has to be ordered separately!

System part	Protective field range	Type	Part no.
Sensor head with I/O module	4 m	S30A-4011DB	1028939
	5.5 m	S30A-6011DB	1026401
	7 m	S30A-7011DB	1026402
Sensor head	4 m	Sensor head short range	2034999
	5.5 m	Sensor head medium range	2022972
	7 m	Sensor head long range	2026747
I/O module	-	I/O module Professional CMS	2030915

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 and 1040.11, DIN EN 60825:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$7.67 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Front screen material	Polycarbonate
Front screen surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	155 mm x 185 mm x 160 mm
Weight	3.3 kg

## Functional data

Scan angle	190°
Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	60 ms, 120 ms <sup>1)</sup>
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Angular resolution	0.5°, 0.25°, depending on range and resolution
Protective field supplement	100 mm
Warning field range	49 m (20 m at 20 % reflectivity)
Distance measuring range	49 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

<sup>1)</sup> Depending on basic response time and multiple sampling

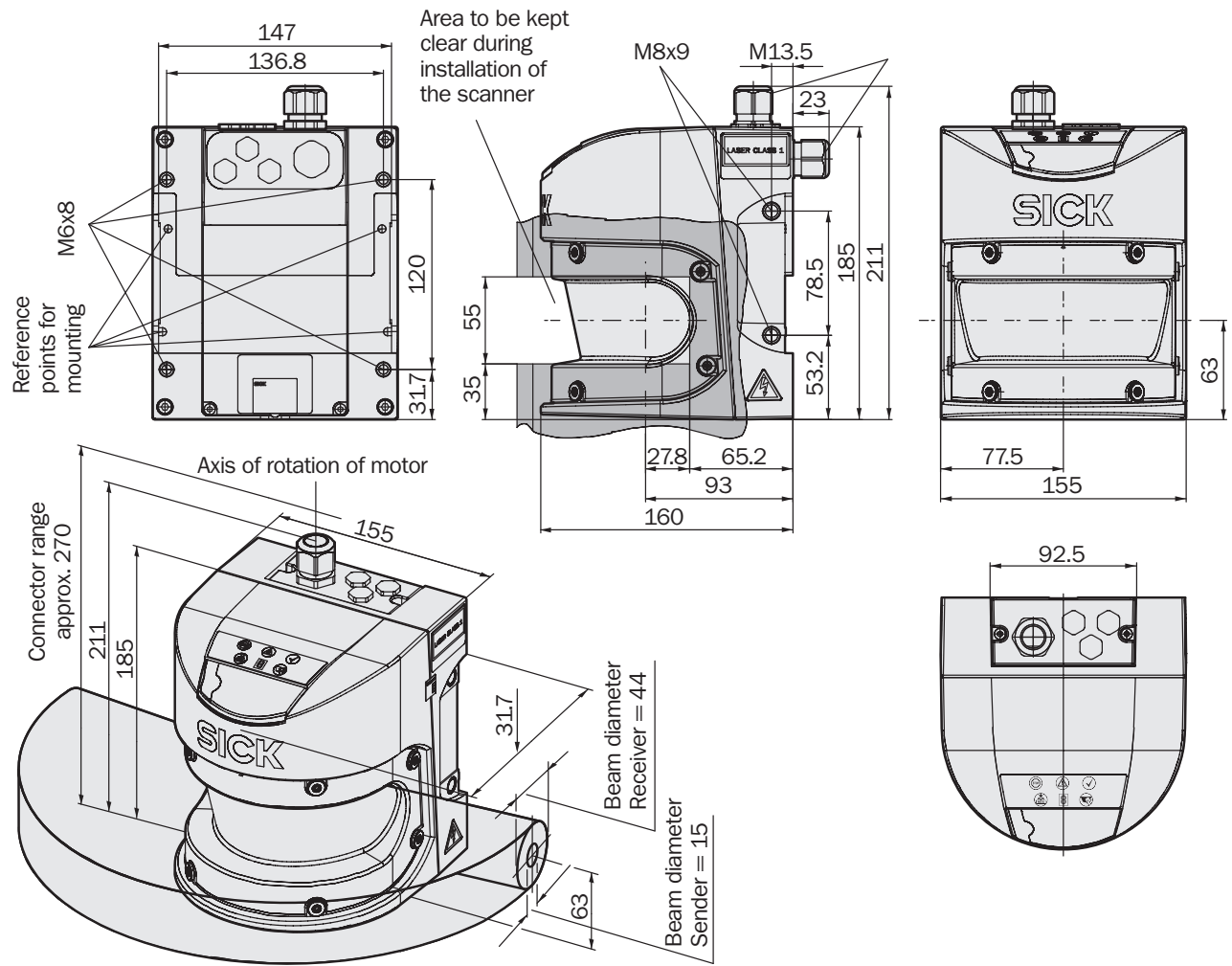
## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 28.8 V DC)
Power consumption	0.8 A (24 V DC) 2.3 A <sup>1)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Static switching signals	2, 4
Dynamic encoder signals (incremental encoder)	2
Number of outputs	
Safety outputs (OSSD)	2 x 500 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	9.6 kBaud, 19.2 kBaud, 38.4 kBaud
Data interface	RS-422 (≤ 500 kBaud)
Safe device communication via EFI/SDL	
Transmission rate	≤ 500 kBaud
Cable length	50 m
Connection conductor cross-section	0.34 mm <sup>2</sup>

<sup>1)</sup> Including maximum output load

D

# Dimensional drawings



Dimensions in mm

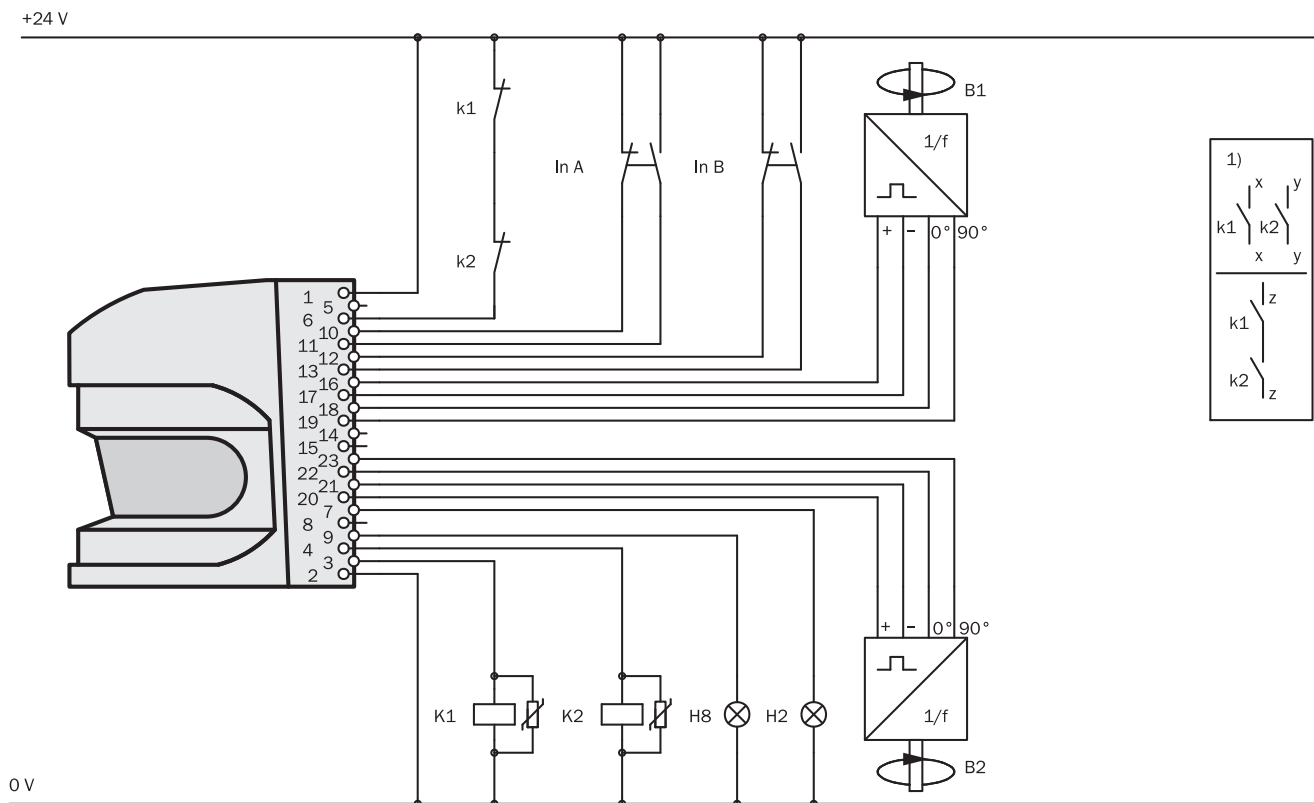
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## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Protective field switching with static and dynamic inputs

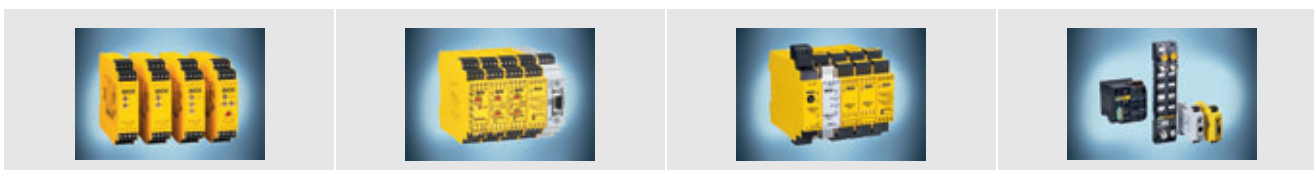
D



- S3000 Professional CMS in conjunction with relays/contactors
- Operating mode: without restart interlock with external device monitoring (EDM)

- Dynamic protective field switching using B1 and B2 as well as static protective field switching using the control inputs A and B





### sens:Control – safe control solutions







Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	Non-adjustable	-	Mounting kit 1	2015623
			Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1	Mounting kit 2	2015624
		Mounting at the rear or below on wall, floor or machine	Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1 and 2	Mounting kit 3	2015625
	Mounting bracket, rugged design, with protective cover	Floor mounting	Height adjustment possible	-	Mounting bracket	7087514


### System plugs

Figure	Direction of cable outlet	Usage	Connection type	Number of cores	Cable length	Type	Part no.
	Upward	Not for use with incremental encoders	Without cable	-	-	SX0A-A0000B	2023797
			Pre-assembled	17	5 m	SX0A-B1705B	2027174
					10 m	SX0A-B1710B	2027175
		20 m	SX0A-B1720B	2027816			
		For use with incremental encoders	Without cable	-	-	SX0A-A0000D	2023310
			Pre-assembled	13	5 m	SX0A-B1305D	2027176
	10 m	SX0A-B1310D			2027177		


### Connecting cables

Figure	Cable type	Number of cores	Type	Part no.
	By the meter	17	Connection cable	6025730
		13	Connection cable	6025729
	By the meter	-	EFI connection cable	6029448

### SDL connection cables


Figure	Note	Direction of cable outlet	Connection type	Number of cores	Cable length	Part no.
	For the connection of safety bus modules to S3000	Straight	Interconnection plug M23 x 12	12	2.5 m	2029337
					5 m	2029338
					10 m	2029339
					15 m	2029340

**Cable glands**


Figure	Usage	Size of the cable gland	Permissible cable diameter	Description	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	For quick and easy shield connection	5314772
				-	5308757
	For system plug S3000	M20	7 mm ... 12 mm	-	5308762
			10 mm ... 14 mm	For quick and easy shield connection	5314774
				-	5318531

D

**Configuration connection cables**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

Figure	Description	Items supplied	Type	Part no.
	Front screen replacement kit	With replacement seal and screws	Front screen replacement kit	2027180
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353

## Technical data overview

**Note:** S3000 PROFINET IO does not have any local inputs or outputs and is only operated in a network with corresponding controller.

Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Warning field range	49 m (20 m at 20 % reflectivity)
Number of field sets	8
Scan angle	190°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Response time	60 ms, 120 ms

## Product description

S3000 PROFINET IO Professional is the ideal system for direct integration in the bus system. The device communicates all I/O signals directly with the network or the higher level control, including detailed diagnostics. Three scanning range variants with 8 protective fields prepare the system for the future.

- Instructive diagnostic messages
- Simple process image
- Future-oriented and expandable
- Mounting compatibility with conventional S3000 systems (brackets)

- Incorporated in the CDS "Configuration & Diagnostic Software" platform
- PROFINET IO with Conformance Class B
- PROFIsafe V2.0
- Ethernet TCP/IP
- 2-port switch with autonegotiation and autocrossing
- 100 Mbit/s (10 Mbit/s for configuration and diagnosis purposes)
- SNMP
- LLDP
- Cyclic IO communication
- Acyclic read/write services for communication via TCI interface

## In-system added value

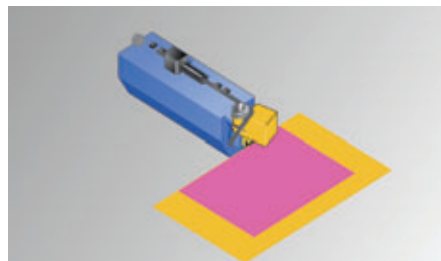
- Direct integration in bus systems with higher level control
- Device access via network

→ For more combinations, see annex

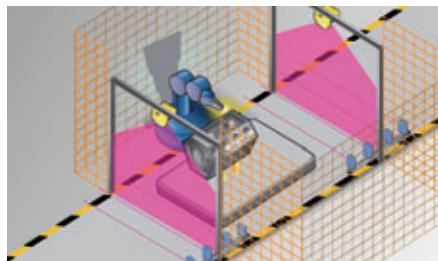
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Hazardous area protection on machines
- Entry/exit systems
- Protection of machines with changing protection areas
- Hazardous area protection in robot cells (e.g., welding applications)
- Hazardous area protection in production systems (e.g., final assembly lines)



Hazardous area protection on a pipe-bending machine



Safe vertical monitoring with detection of people



- Direct integration in bus systems
- Configuration memory
- Selectable resolution
- 7-segment indicator
- Certified for vertical use
- 2 standard PROFINET IO sockets for RJ-45 push-pull



Further information	Page
→ Ordering information	D-42
→ Technical specifications	D-42
→ Dimensional drawings	D-44
→ Accessories	D-45
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S3000 systems:

- Sensor head with I/O module mounted
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "Important information"

The supply connector has to be ordered separately!

System part	Protective field range	Type	Part no.
Sensor head with I/O module	4 m	S30A-4111DP	1045651
	5.5 m	S30A-6111DP	1045653
	7 m	S30A-7111DP	1045655
Sensor head	4 m	S30A-4111	2049566
	5.5 m	S30A-6111	2049567
	7 m	S30A-7111	2049568
I/O module	-	S30A-xxxxDP	2047169

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 and 1040.11, DIN EN 60825:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	III (DIN VDE 0160, EN 60950)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$4.0 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Front screen material	Polycarbonate
Front screen surface finish	Outside with scratch-resistant coating
Supply connector	With ESD protected configuration memory
Dimensions (W x H x D)	155 mm x 185 mm x 160 mm
Weight	3.3 kg



**Functional data**

Scan angle	190°
Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	60 ms, 120 ms <sup>1)</sup>
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Angular resolution	0.5°, 0.25°, depending on range and resolution
Protective field supplement	100 mm
Warning field range	49 m (20 m at 20 % reflectivity)
Distance measuring range	49 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

<sup>1)</sup> Depending on basic response time and multiple sampling

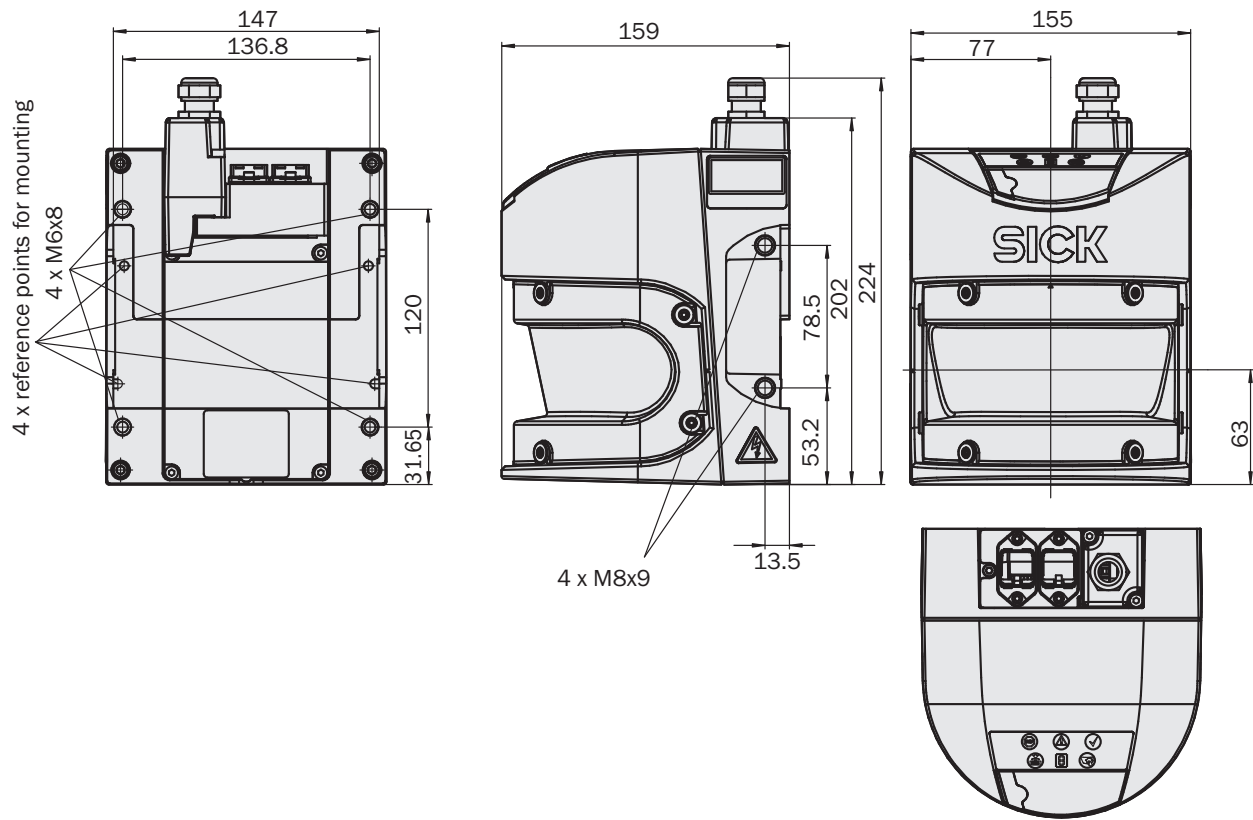
**Electrical data**

Connection type	2 sockets for RJ-45 push-pull connector Plug-in supply connector with screw type terminal and cable gland for cable diameter 5 mm ... 10 mm
Supply voltage $V_S$	24 V DC (16.8 V DC ... 28.8 V DC)
Power consumption	0.8 A (24 V DC) 2.3 A
Local configuration and diagnostics interface	RS-232
Transmission rate	9.6 kBaud, 19.2 kBaud, 38.4 kBaud
Supported services	PROFINET IO Conformance Class B, LLDP, SNMP, MIB II, acyclic read/write services for communication via TCI interface, TCP/IP communication via Port 9000

**D**

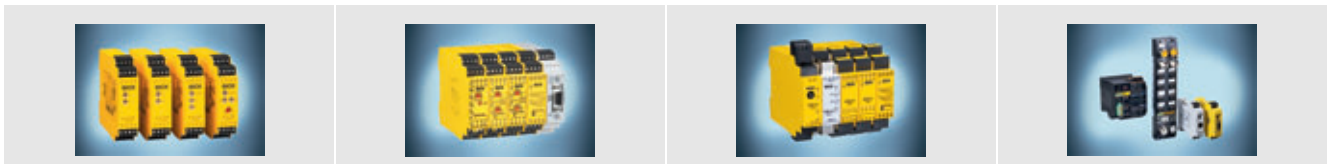
## Dimensional drawings

D



Dimensions in mm





## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	Non-adjustable	–	Mounting kit 1	2015623
			Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1	Mounting kit 2	2015624
		Mounting at the rear or below on wall, floor or machine	Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1 and 2	Mounting kit 3	2015625
	Mounting bracket, rugged design, with protective cover	Floor mounting	Height adjustment possible	–	Mounting bracket	7087514

### System plugs

Description	Connection type	Cable length	Type	Part no.
Supply connector	Without cable	–	SX1A-A0000L	2047286
Supply connector with cable	Pre-assembled	1 m	SX1A-B0201L	2049575
Power y-junction with supply connector	–	–	SX1A-B0201M	2049857

### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


### Configuration software

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

### Cleaning agent

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

### Other

Figure	Description	Items supplied	Type	Part no.
	Front screen replacement kit	With replacement seal and screws	Front screen replacement kit	2027180
	Cloth for cleaning the front screen	–	Optical cleaning cloth	4003353



D

- Direct integration in bus systems
- Configuration memory
- Selectable resolution
- 7-segment indicator
- Certified for vertical use
- 2 standard PROFINET IO sockets for RJ-45 push-pull



## Technical data overview

**Note:** S3000 PROFINET IO does not have any local inputs or outputs and is only operated in a network with corresponding controller.

Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Warning field range	49 m (20 m at 20 % reflectivity)
Number of field sets	4
Scan angle	190°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Response time	60 ms, 120 ms

## Product description

S3000 PROFINET IO Advanced is the ideal system for direct integration in the bus system. The device communicates all I/O signals directly with the network or the higher level control, including detailed diagnostics. Three scanning range variants with 4 protective fields prepare the system for the future.

- Instructive diagnostic messages
- Simple process image
- Future-oriented and expandable
- Mounting compatibility with conventional S3000 systems (brackets)

- Incorporated in the CDS "Configuration & Diagnostic Software" platform
- PROFINET IO with Conformance Class B
- PROFI-safe V2.0
- Ethernet TCP/IP
- 2-port switch with autonegotiation and autocrossing
- 100 Mbit/s (10 Mbit/s for configuration and diagnosis purposes)
- SNMP
- LLDP
- Cyclic IO communication
- Acyclic read/write services for communication via TCI interface

## In-system added value

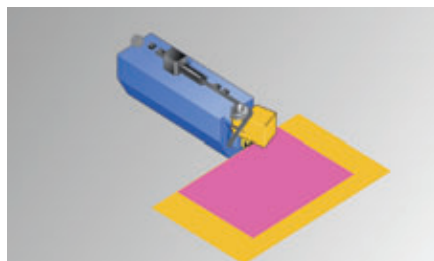
- Direct integration in bus systems with higher level control
- Device access via network

→ For more combinations, see annex

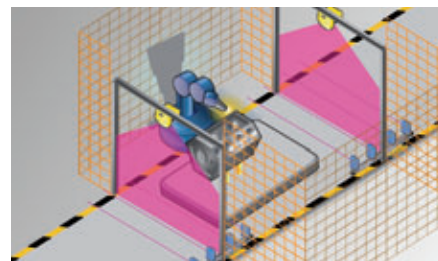
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Hazardous area protection on machines
- Entry/exit systems
- Protection of machines with changing protection areas
- Hazardous area protection in robot cells (e.g., welding applications)
- Hazardous area protection in production systems (e.g., final assembly lines)



Hazardous area protection on a pipe-bending machine



Safe vertical monitoring with detection of people

Further information	Page
→ Dimensional drawings	D-49
→ Accessories	D-50
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S3000 systems:

- Sensor head with I/O module mounted
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "Important information"

The supply connector has to be ordered separately!

System part	Protective field range	Type	Part no.
Sensor head with I/O module	4 m	S30A-4111CP	1045650
	5.5 m	S30A-6111CP	1045652
	7 m	S30A-7111CP	1045654
Sensor head	4 m	S30A-4111	2049566
	5.5 m	S30A-6111	2049567
	7 m	S30A-7111	2049568
I/O module	-	S30A-xxxCP	2047737

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 and 1040.11, DIN EN 60825:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	III (DIN VDE 0160, EN 60950)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$4.0 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Front screen material	Polycarbonate
Front screen surface finish	Outside with scratch-resistant coating
Supply connector	With ESD protected configuration memory
Dimensions (W x H x D)	155 mm x 185 mm x 160 mm
Weight	3.3 kg

**Functional data**

Scan angle	190°
Protective field range, radial (depending on type)	4 m / 5.5 m / 7 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	60 ms, 120 ms <sup>1)</sup>
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Angular resolution	0.5°, 0.25°, depending on range and resolution
Protective field supplement	100 mm
Warning field range	49 m (20 m at 20 % reflectivity)
Distance measuring range	49 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

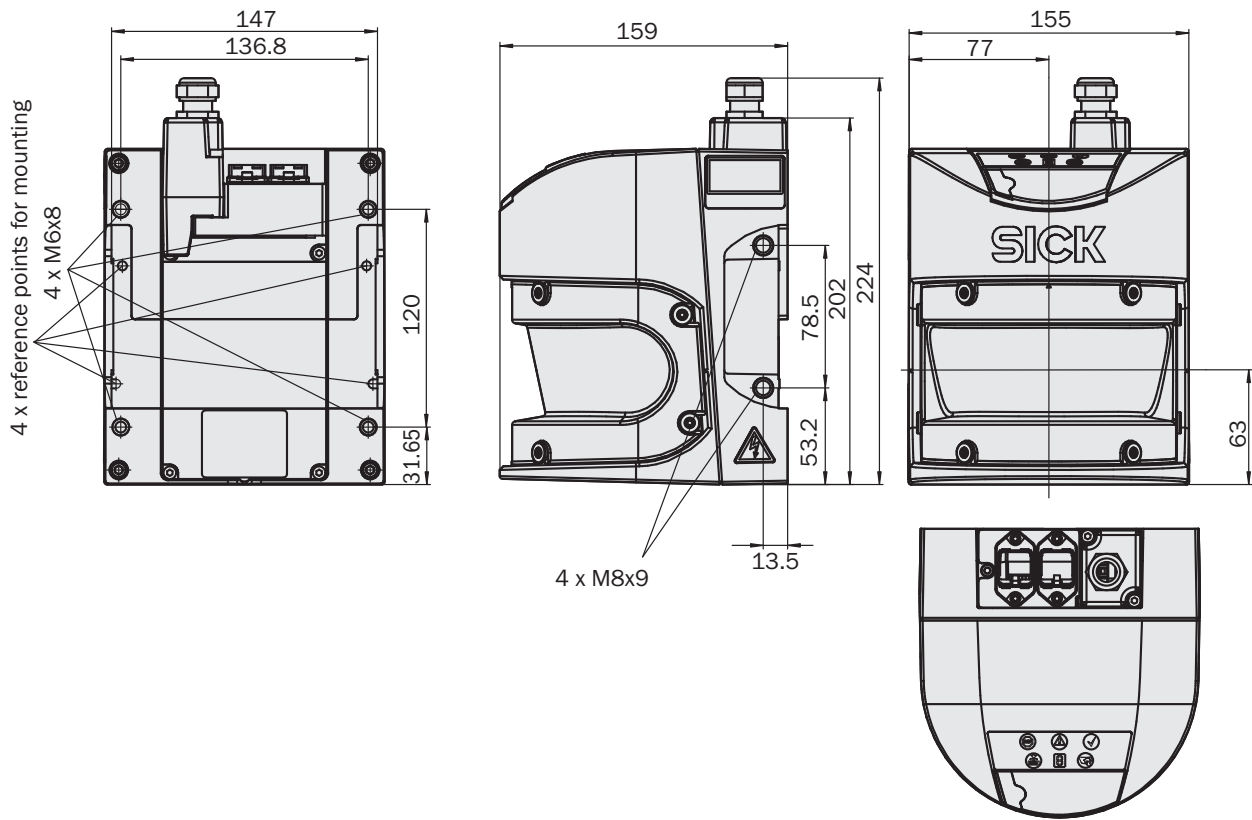
<sup>1)</sup> Depending on basic response time and multiple sampling

**Electrical data**

Connection type	2 sockets for RJ-45 push-pull connector Plug-in supply connector with screw type terminal and cable gland for cable diameter 5 mm ... 10 mm
Supply voltage $V_S$	24 V DC (16.8 V DC ... 28.8 V DC)
Power consumption	0.8 A (24 V DC) 2.3 A
Local configuration and diagnostics interface	RS-232
Transmission rate	9.6 kBaud, 19.2 kBaud, 38.4 kBaud
Supported services	PROFINET IO Conformance Class B, LLDP, SNMP, MIB II, acyclic read/write services for communication via TCI interface, TCP/IP communication via Port 9000

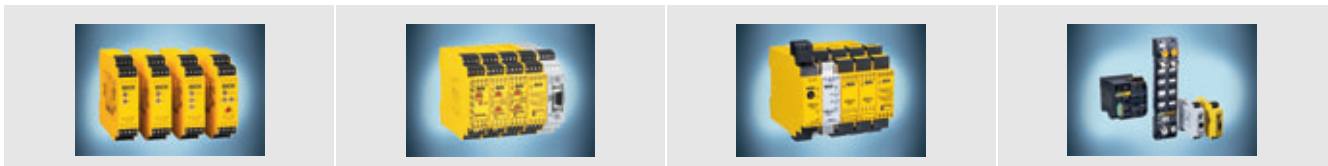
D

## Dimensional drawings



Dimensions in mm





## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	Non-adjustable	-	Mounting kit 1	2015623
			Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1	Mounting kit 2	2015624
		Mounting at the rear or below on wall, floor or machine	Longitudinal and cross-wise adjustment possible	Only in conjunction with mounting kit 1 and 2	Mounting kit 3	2015625
	Mounting bracket, rugged design, with protective cover	Floor mounting	Height adjustment possible	-	Mounting bracket	7087514

### System plugs

Description	Connection type	Cable length	Type	Part no.
Supply connector	Without cable	-	SX1A-A0000L	2047286
Supply connector with cable	Pre-assembled	1 m	SX1A-B0201L	2049575
Power y-junction with supply connector	-	-	SX1A-B0201M	2049857

### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


### Configuration software

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

### Cleaning agent

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

### Other

Figure	Description	Items supplied	Type	Part no.
	Front screen replacement kit	With replacement seal and screws	Front screen replacement kit	2027180
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353



## Technical data overview

Ambient operating temperature from ... to	-30 °C ... +50 °C
Enclosure rating	IP 65, IP 67 (EN 60529)
Protective field range, radial	7 m
Warning field range	49 m (20 m at 20 % reflectivity)
Number of field sets	4
Scan angle	180°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Response time	60 ms

## Product description

The S3000 Cold Store safety laser scanner provides protection for persons and in plants and is particularly suitable for use in cold areas down to -30 °C. Both stationary applications (e.g., area or gate protection) and mobile applications (e.g., AGVs) can be implemented. The scanner has an IP 67 housing and is equipped with integrated,

thermostatically controlled heating. Thus the device requires no additional measures for use. In addition, the scanner has up to 4 switchable protective fields, an intelligent bus connection, and offers the most flexibility.

The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

Combined with SICK safe control solutions

→ For more combinations, see annex

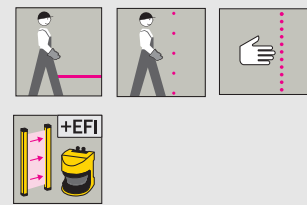
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Entry/exit
- Door and gate protection
- Area protection in cold areas
- AGV protection
- High-bay warehouses
- Narrow aisle



Hazardous area protection in cold storage with S3000 Cold Store



- Scanning range 7 m
- Selectable resolution
- Integrated heating
- Enclosure rating IP 67
- 7-segment display



Further information	Page
→ Ordering information	D-52
→ Technical specifications	D-52
→ Dimensional drawings	D-54
→ Connection diagrams	D-55
→ Accessories	D-56
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S3000 Cold Store:

- S3000 Cold Store incl. system plug
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "Important information"

Type	Part no.
S31A-7011CA	1041648

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 and 1040.11, DIN EN 60825:2001)
Enclosure rating	IP 65, IP 67 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$7.67 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-30 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Back panel, plug	Aluminum diecast
Cover	Polyurethane
Front screen material	Polycarbonate
Front screen surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	351 mm x 265 mm x 228 mm
Weight	9 kg

### Functional data

Scan angle	180°
Protective field range, radial	7 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	60 ms
Resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Angular resolution	0.5°, 0.25°, depending on range and resolution
Protective field supplement	100 mm
Warning field range	49 m (20 m at 20 % reflectivity)
Distance measuring range	49 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

## Electrical data

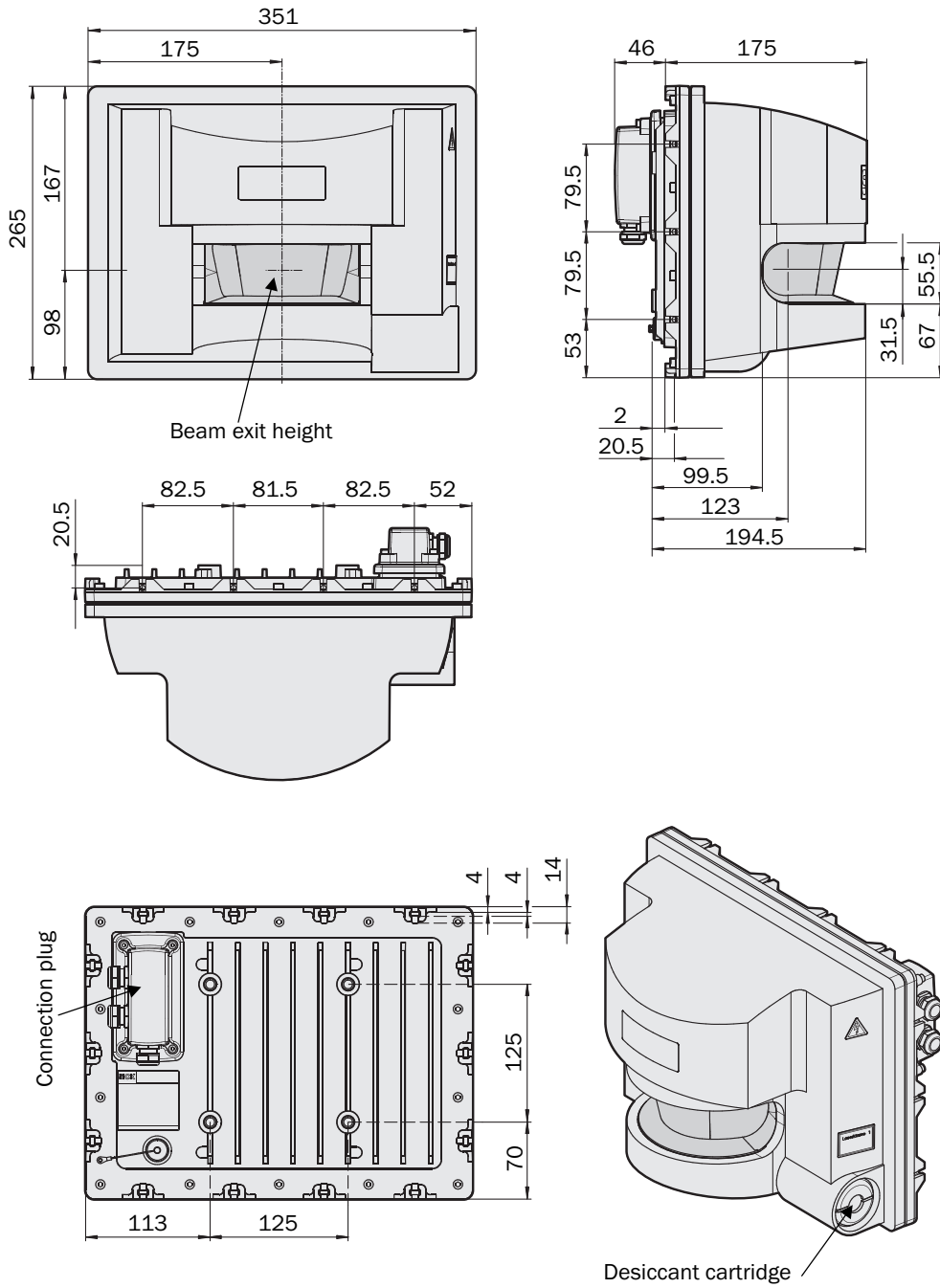
Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $U_v$ scanner	24 V DC (17.5 V DC ... 28.8 V DC)
Supply voltage $U_v$ heating	24 V DC (16.8 V DC ... 28.8 V DC)
Power consumption scanner	0.8 A (24 V DC) <sup>1)</sup> 2.3 A <sup>2)</sup>
Power consumption heating	6 A, cyclical
Number of inputs	
Static switching signals	2
Number of outputs	
Safety outputs (OSSD)	2 x 500 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	9.6 kBaud, 19.2 kBaud, 38.4 kBaud
Safe device communication via EFI/SDL	
Transmission rate	≤ 500 kBaud
Cable length	50 m
Connection conductor cross-section	0.34 mm <sup>2</sup>

<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load

# Dimensional drawings

D

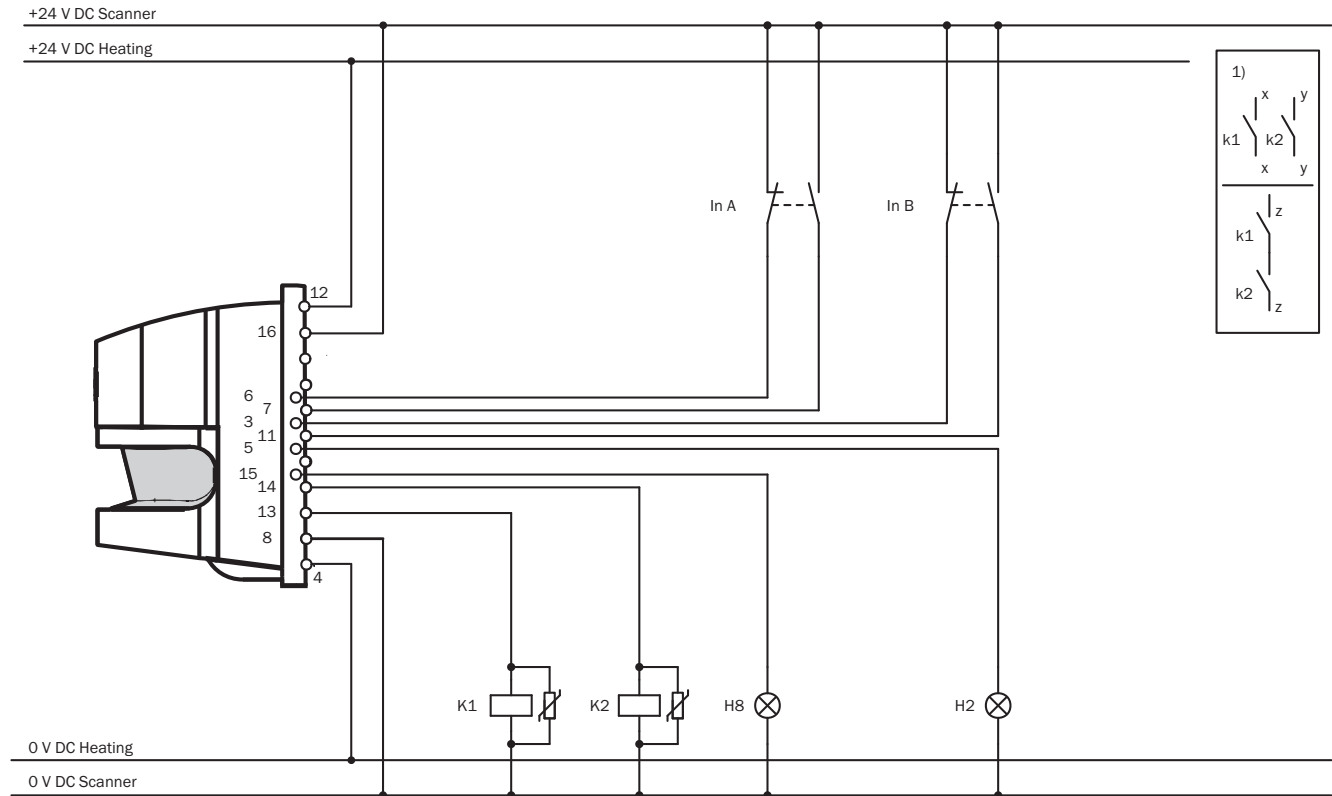


Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

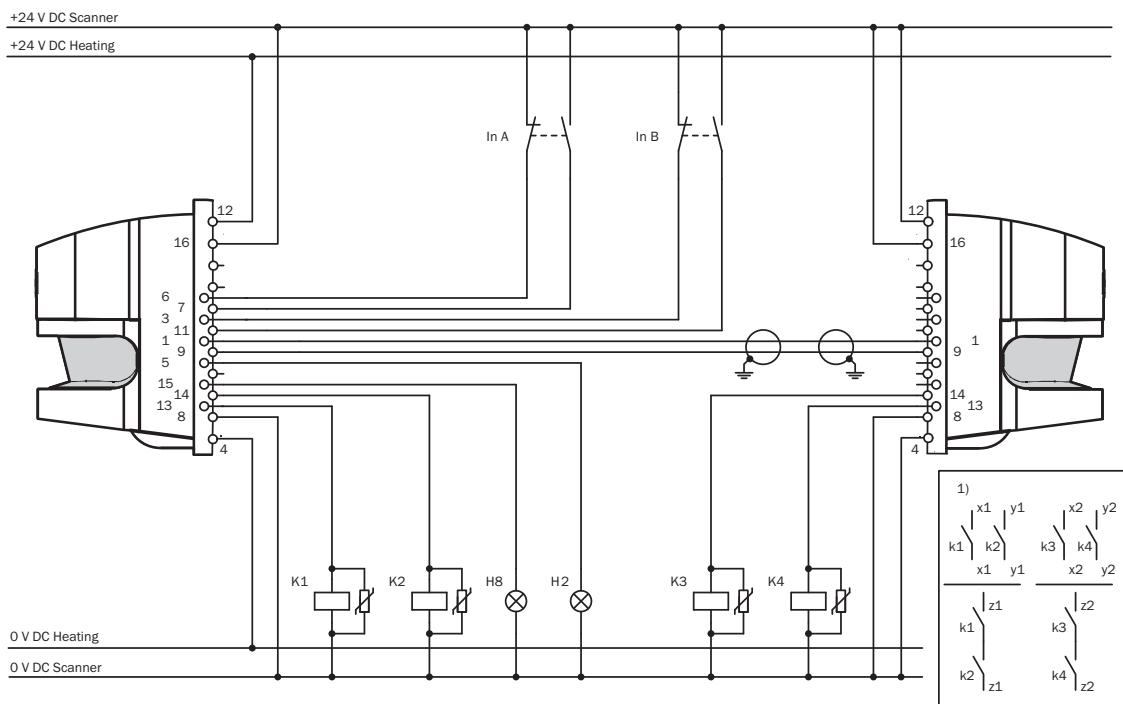
### Protective field switching with two static inputs



- S3000 Cold Store in conjunction with relays/contactors
- Protective field switching by means of control inputs A and B

D

Protective field switching between two S3000s with static inputs

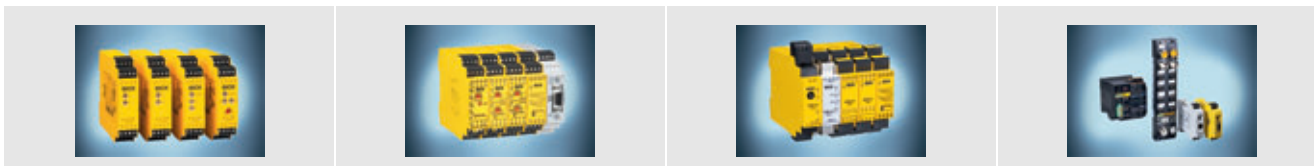


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■ S3000 Cold Store with S3000 Cold Store in conjunction with relays/contactors

■ Protective field switching by means of control input A and control input B on separate OSSD pairs (simultaneous monitoring)

sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

Accessories



Mounting systems

Figure	Type	Part no.
	Adjustable bracket for wall mounting	2018303


Connecting cables

Figure	Cable type	Number of cores	Type	Part no.
	By the meter	13	Connection cable	6025729
	-	-	Service cable, pre-assembled for RS-232	2019561

**Connectors**

Figure	Type	Part no.
	Plug insert 16-pin (spring strip)	6004379
	16-pin connection plug	2018301

**Cable glands**

Figure	Usage	Size of the cable gland	Permissible cable diameter	Description	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	For quick and easy shield connection	5314772
				-	5308757
	For system plug S3000	M20	7 mm ... 12 mm	-	5308762
			10 mm ... 14 mm	For quick and easy shield connection	5314774
				-	5318531


**Power supply units**

Input voltage	Output voltage	Maximum output current	Type	Part no.
120 V AC, 230 V AC	24 V DC	10 A	Power supply	6011156

**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Device protection**

Figure	Type	Part no.
	Desiccant cartridge with male thread M36 x 1.5	5306179

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

Figure	Description	Type	Part no.
	Cloth for cleaning the front screen	Optical cleaning cloth	4003353



D

- Extremely compact design
- Scanning angle 270°
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)
- Stand-by input



## Technical data overview

Protective field range, radial	2 m
Warning field range	8 m (at 30 % reflectivity)
Number of field sets	8
Scan angle	270°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Response time	80 ms

## Product description

The safety laser scanner for mobile or stationary use. The ideal solution for small automated guided vehicles and service robots which require a high number of protective and warning fields.

- 8 switchable protective/warning fields
- Adjustable object resolution

- Facility for connecting incremental encoder
- Measured data output over RS-422 data interface
- Multi-system "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

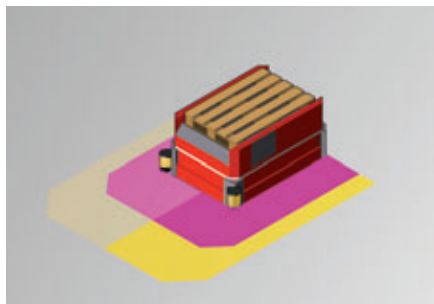
Combined with SICK safe control solutions

→ For more combinations, see annex

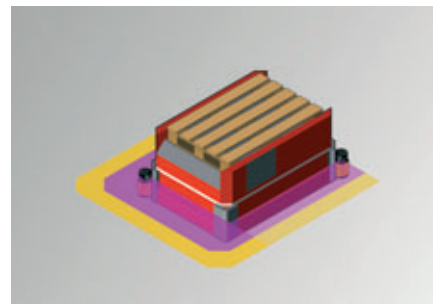
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Automated Guided Vehicles (AGVs)



Hazardous area protection of an AGV in direction of travel and on the sides



All around protection of an AGV using two S300 Experts

Further information	Page
→ Dimensional drawings	D-61
→ Connection diagrams	D-63
→ Accessories	D-64
→ Systematic safety	A-0
→ Services	B-0



## Ordering information

Delivery S300

- Safety laser scanner
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "important information"

The system plug has to be ordered separately!

Type	Part no.
S30B-2011GA	1045353

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 und 1040.11, IEC 60825-1:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$5.29 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Optics cover material	Polycarbonate
Optics cover surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	102 mm x 152 mm x 105 mm
Weight	1.2 kg

### Functional data

Scan angle	270°
Protective field range, radial	2 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	80 ms
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Angular resolution	0.5°
Protective field supplement	100 mm
Warning field range	8 m (at 30 % reflectivity)
Distance measuring range	30 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

## Electrical data

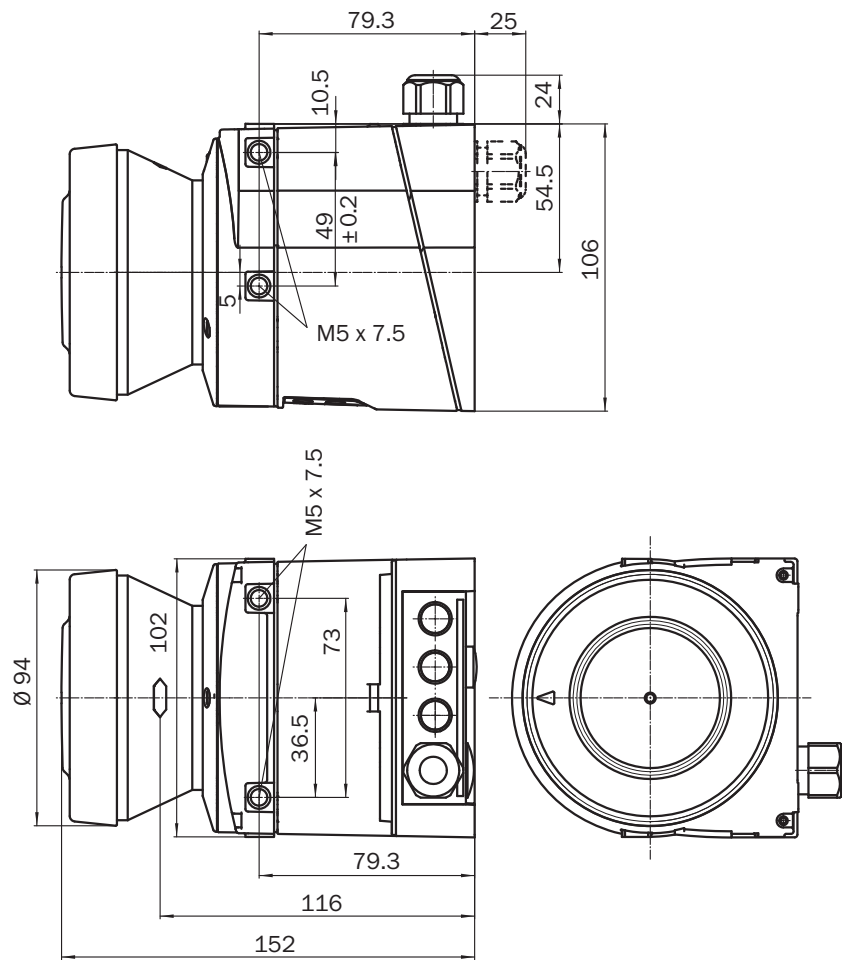
Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 30 V DC)
Power consumption	0.33 A (24 V DC) <sup>1)</sup> 1.65 A <sup>2)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Static switching signals or dynamic encoder signals	2, dual-channel
Standby	1
Number of outputs	
Safety outputs (OSSD)	2 x 250 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	38.4 kBaud
Data interface	RS-422
Transmission rate	38.4 kBaud ... 500 kBaud
Safe device communication via EFI/SDL	
Transmission rate	500 kBaud
Cable length	50 m
Connection conductor cross-section	0.22 mm <sup>2</sup>

<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load

## Dimensional drawings

S300

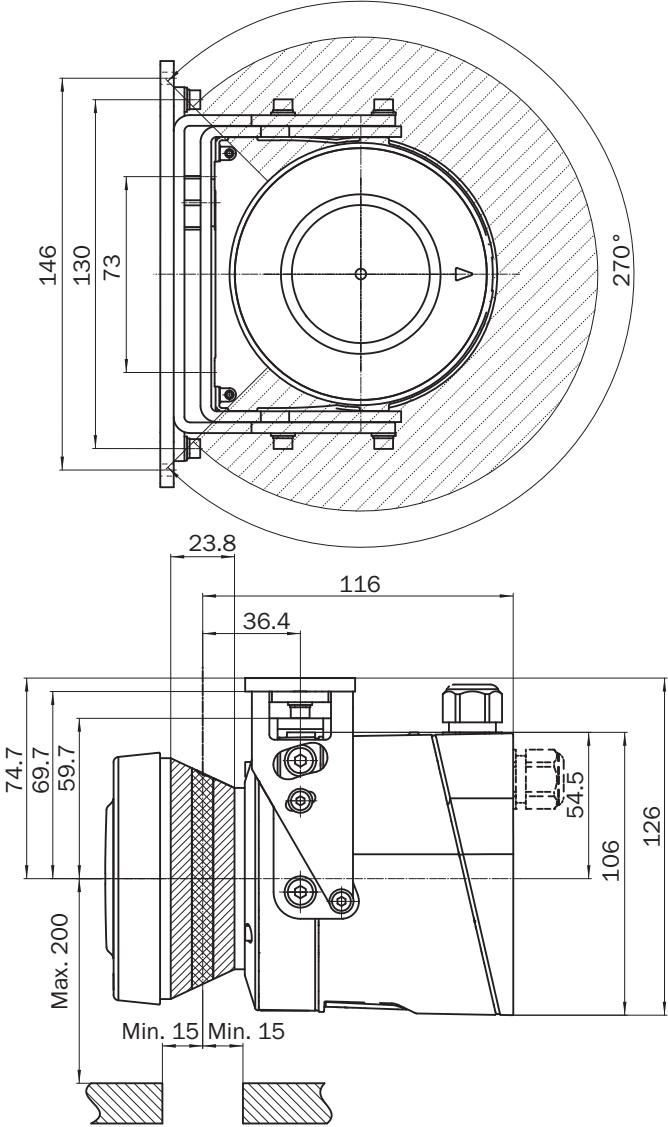


Dimensions in mm

D

Scan plane origin

D

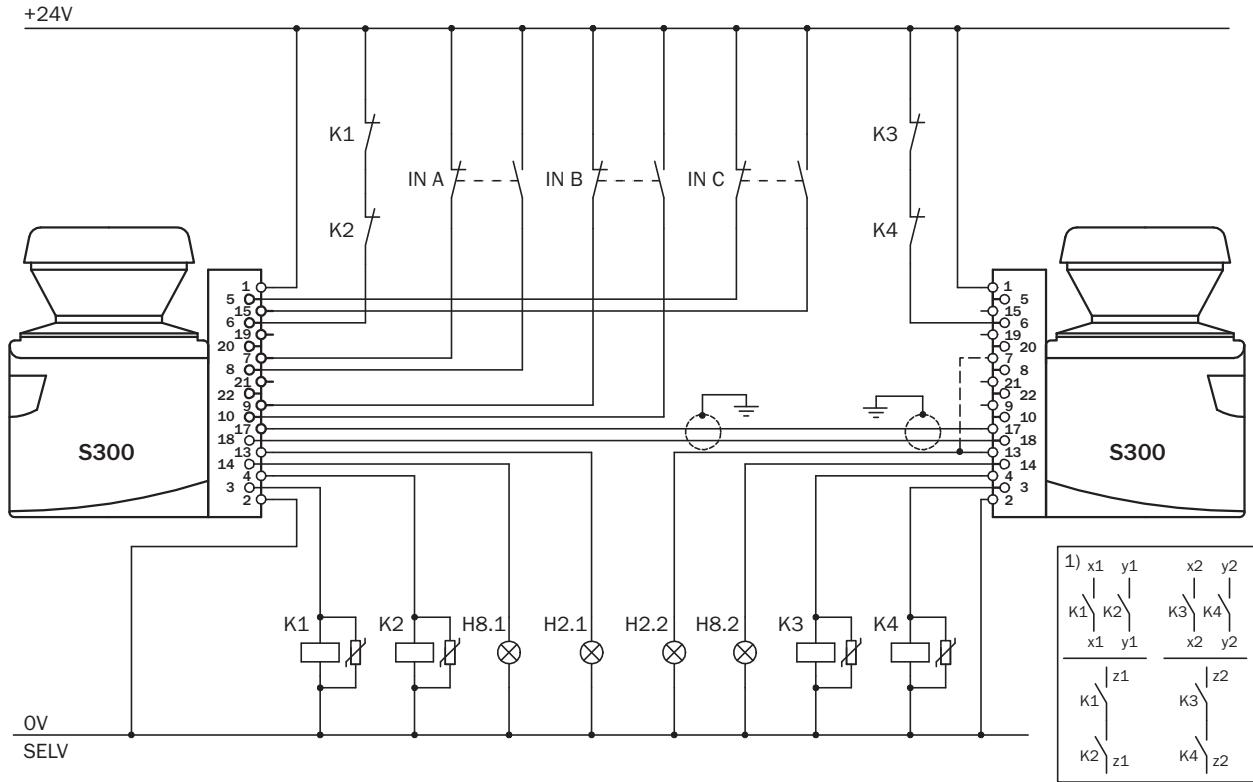


Dimensions in mm

## Connection diagrams

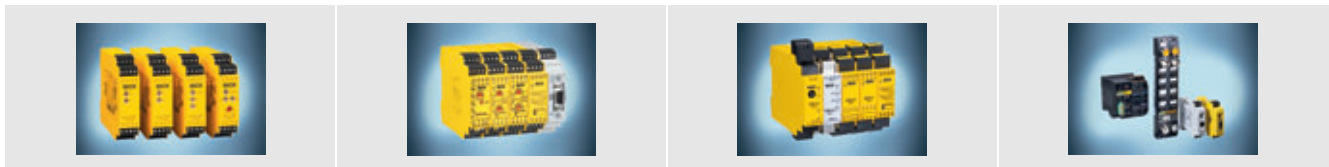
→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### S300 Expert with S300 Expert in master/slave conjunction with relays/contactors



- S300 Expert with S300 Expert in master/slave connection with relays/contactors
- Operating mode: without restart interlock and external device monitoring
- Static protective field switching using the control inputs A, B and C
- The protective fields affect the related OSSDs on master or slave




## sens:Control – safe control solutions






Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	-	-	Mounting kit 1a	2034324
		For rear mounting on wall or machine with protection of optics cover	-	-	Mounting kit 1b	2034325
		-	Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
	Mounting plate	-	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303


### System plugs

Figure	Usage	Connection type	Number of cores	Cable length	Type	Part no.
	Not for use with incremental encoders	Without cable	-	-	SX0B-A0000G	2032807
		Pre-assembled	15	5 m	SX0B-B1505G	2034264
				10 m	SX0B-B1510G	2034265
	For use with incremental encoders	Without cable	-	-	SX0B-A0000J	2032856
		Pre-assembled	11	5 m	SX0B-B1105J	2032857
				10 m	SX0B-B1110J	2032858


### Connecting cables

Figure	Cable type	Number of cores	Type	Part no.
	By the meter	15	Connection cable	6030795
		-	EFI connection cable	6029448


### Cable gland

Figure	Usage	Size of the cable gland	Permissible cable diameter	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	5308757

**Configuration connection cables**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

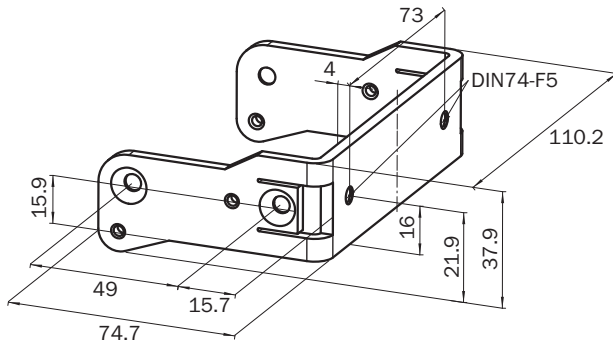
**Other**

Figure	Description	Items supplied	Type	Part no.
	Spare part set optic cover	With replacement seal and screws	Spare part set optic cover	2039248
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353

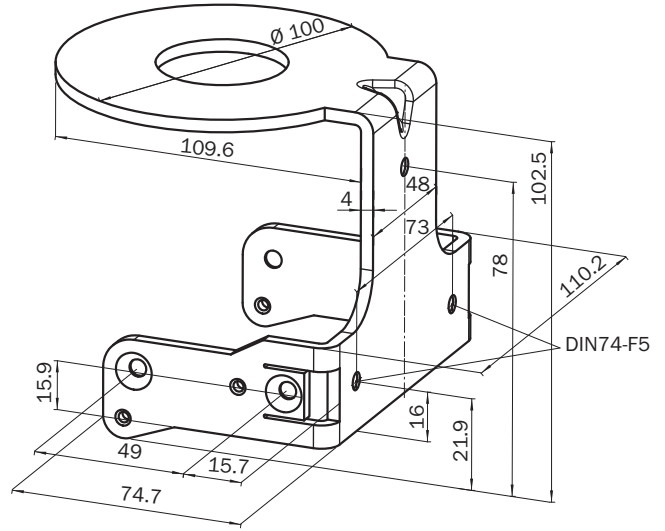
Dimensional drawings mounting systems

D

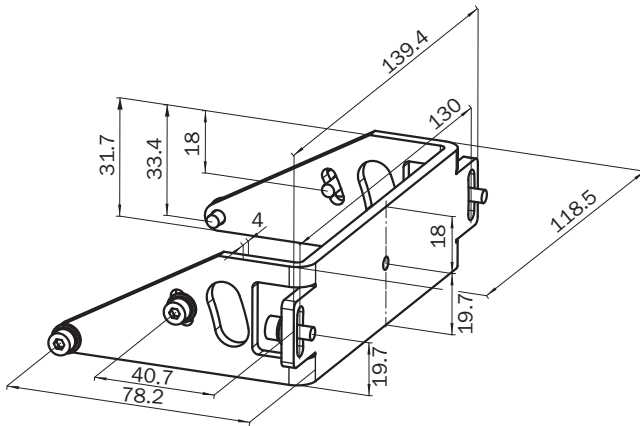
Mounting kit 1a



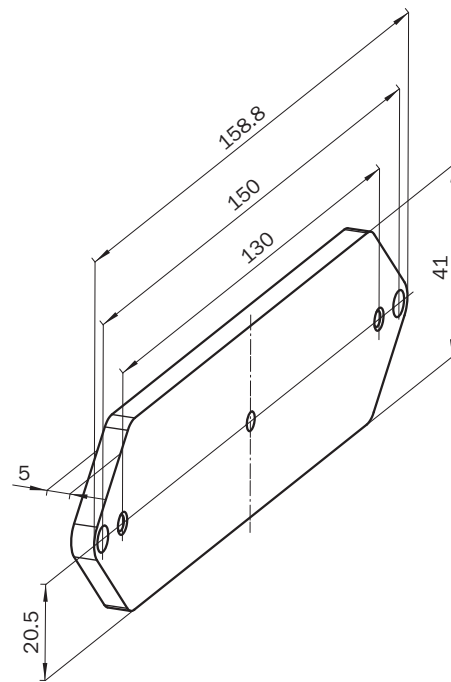
Mounting kit 1b



Mounting kit 2



Mounting kit 3



Dimensions in mm



## Technical data overview

Protective field range, radial	2 m
Warning field range	8 m (at 30 % reflectivity)
Number of field sets	4
Scan angle	270°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Response time	80 ms

## Product description

Small but refined, the safety laser scanner for mobile use.

Optimal protection, e.g., for small, free moving transport systems and service robots on which the protective fields must be flexibly adjusted to different velocities.

- 4 switchable protective/warning fields
- Adjustable object resolution

- Facility for connecting incremental encoder
- Measured data output over RS-422 data interface
- Multi-system "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

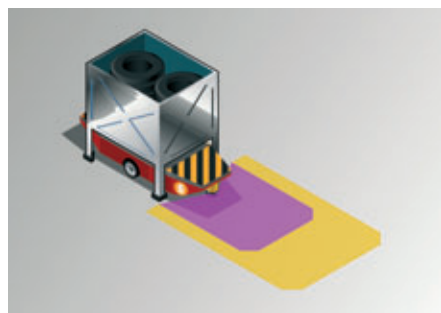
Combined with SICK safe control solutions

→ For more combinations, see annex

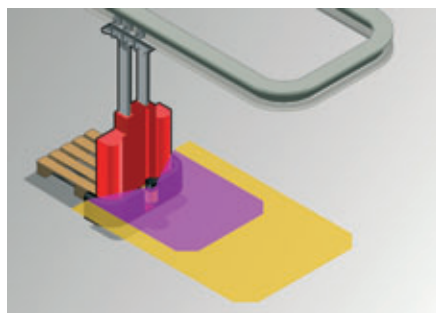
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

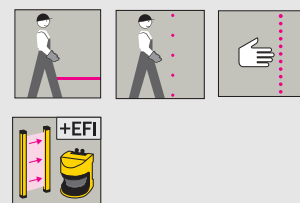
- Automated Guided Vehicles (AGVs)
- Production lines
- Machining centers
- Entry/exit stations (gates)
- Robot cells
- Overhead monorail transport systems



Hazardous area protection of an AGV



Hazardous area protection on an electrical overhead conveyor



- Extremely compact design
- Scanning angle 270°
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)
- Stand-by input



Further information	Page
→ Ordering information	D-68
→ Technical specifications	D-68
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→ Connection diagrams	D-72
→ Accessories	D-74
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S300

- Safety laser scanner
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "important information"

The system plug has to be ordered separately!

Type	Part no.
S30B-2011DA	1026822

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 und 1040.11, IEC 60825-1:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$5.29 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Optics cover material	Polycarbonate
Optics cover surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	102 mm x 152 mm x 105 mm
Weight	1.2 kg

### Functional data

Scan angle	270°
Protective field range, radial	2 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	80 ms
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Angular resolution	0.5°
Protective field supplement	100 mm
Warning field range	8 m (at 30 % reflectivity)
Distance measuring range	30 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 30 V DC)
Power consumption	0.33 A (24 V DC) <sup>1)</sup> 1.65 A <sup>2)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Static switching signals or dynamic encoder signals	2, dual-channel
Standby	1
Number of outputs	
Safety outputs (OSSD)	2 x 250 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	38.4 kBaud
Data interface	RS-422
Transmission rate	38.4 kBaud ... 500 kBaud
Safe device communication via EFI/SDL	
Transmission rate	500 kBaud
Cable length	50 m
Connection conductor cross-section	0.22 mm <sup>2</sup>

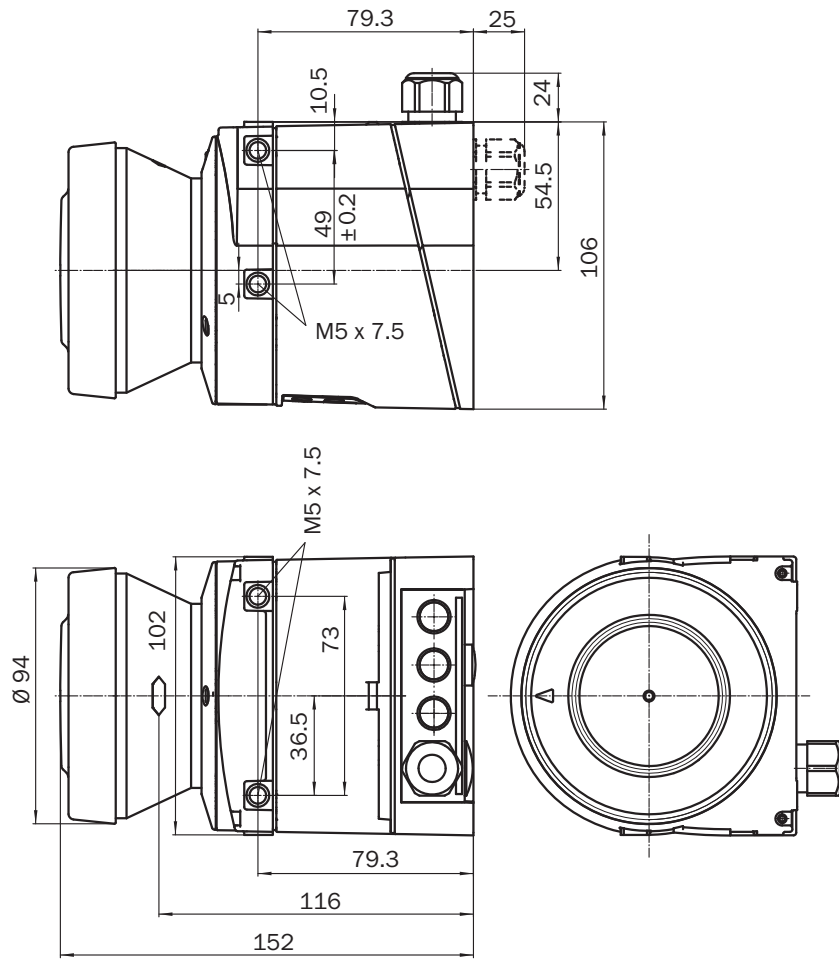
<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load

# Dimensional drawings

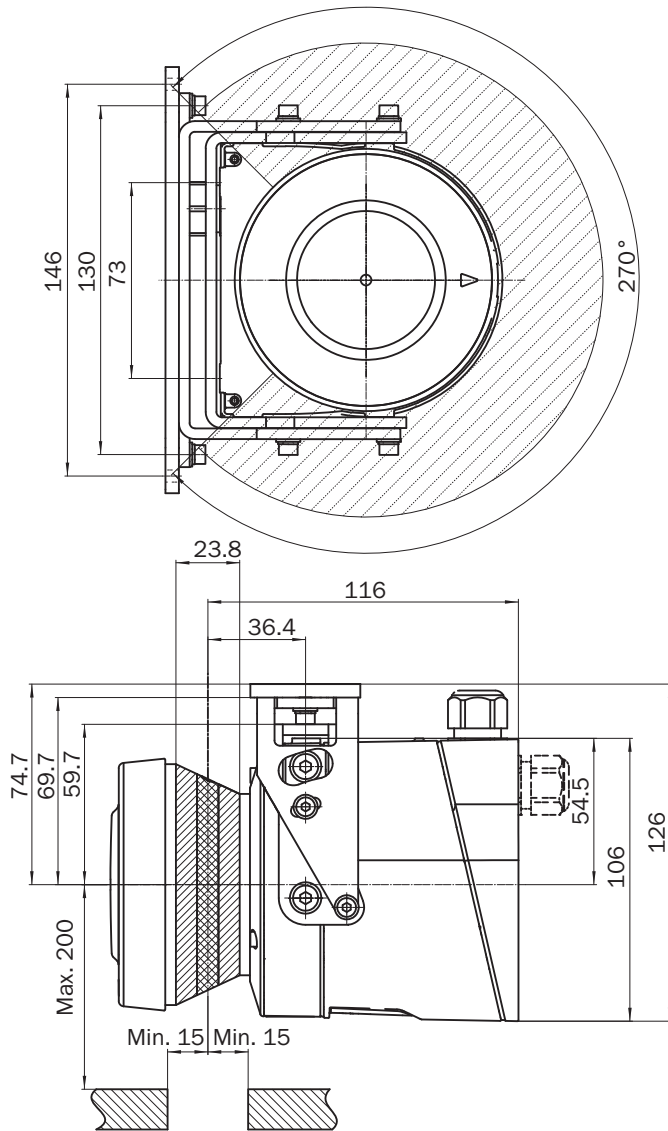
S300

D



Dimensions in mm

Scan plane origin



D

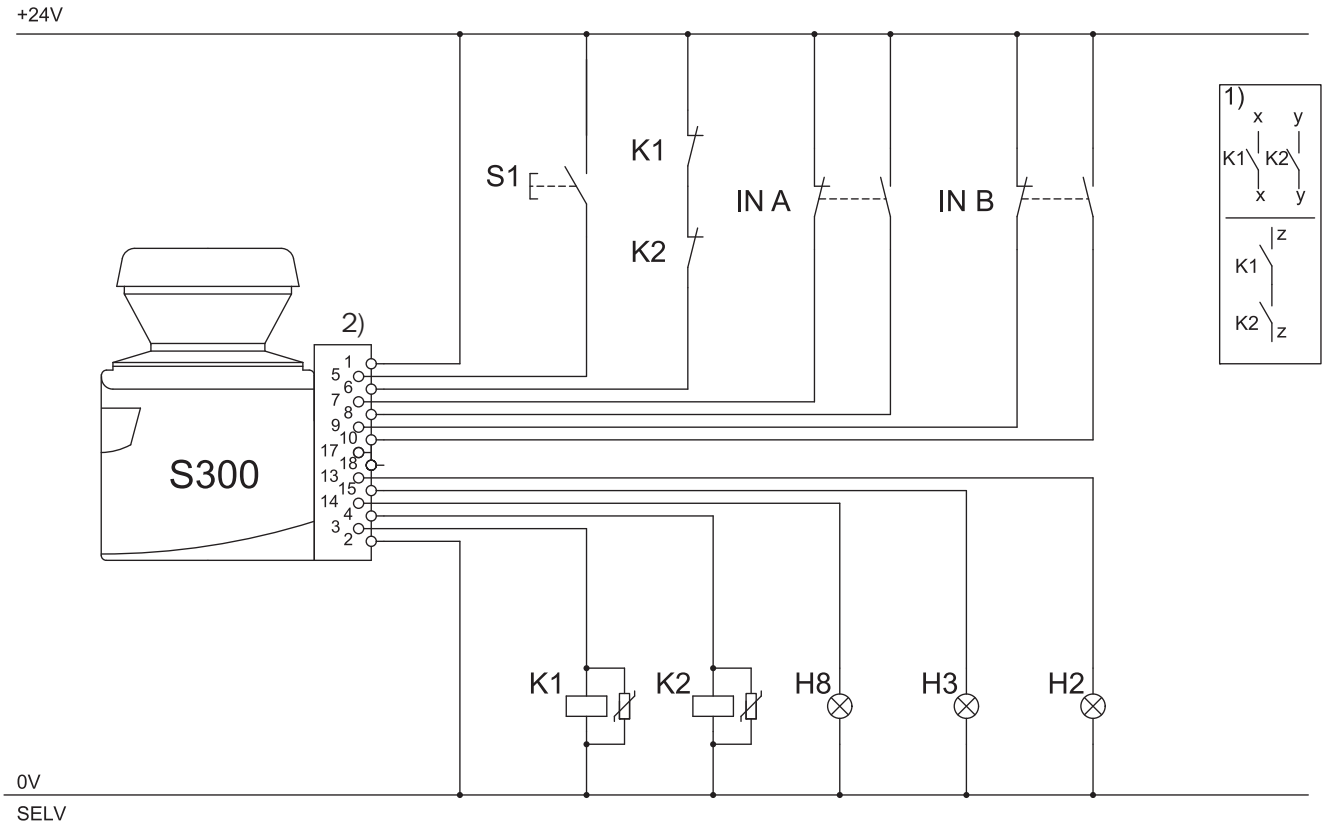
Dimensions in mm

# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## Protective field switching with two static inputs

D

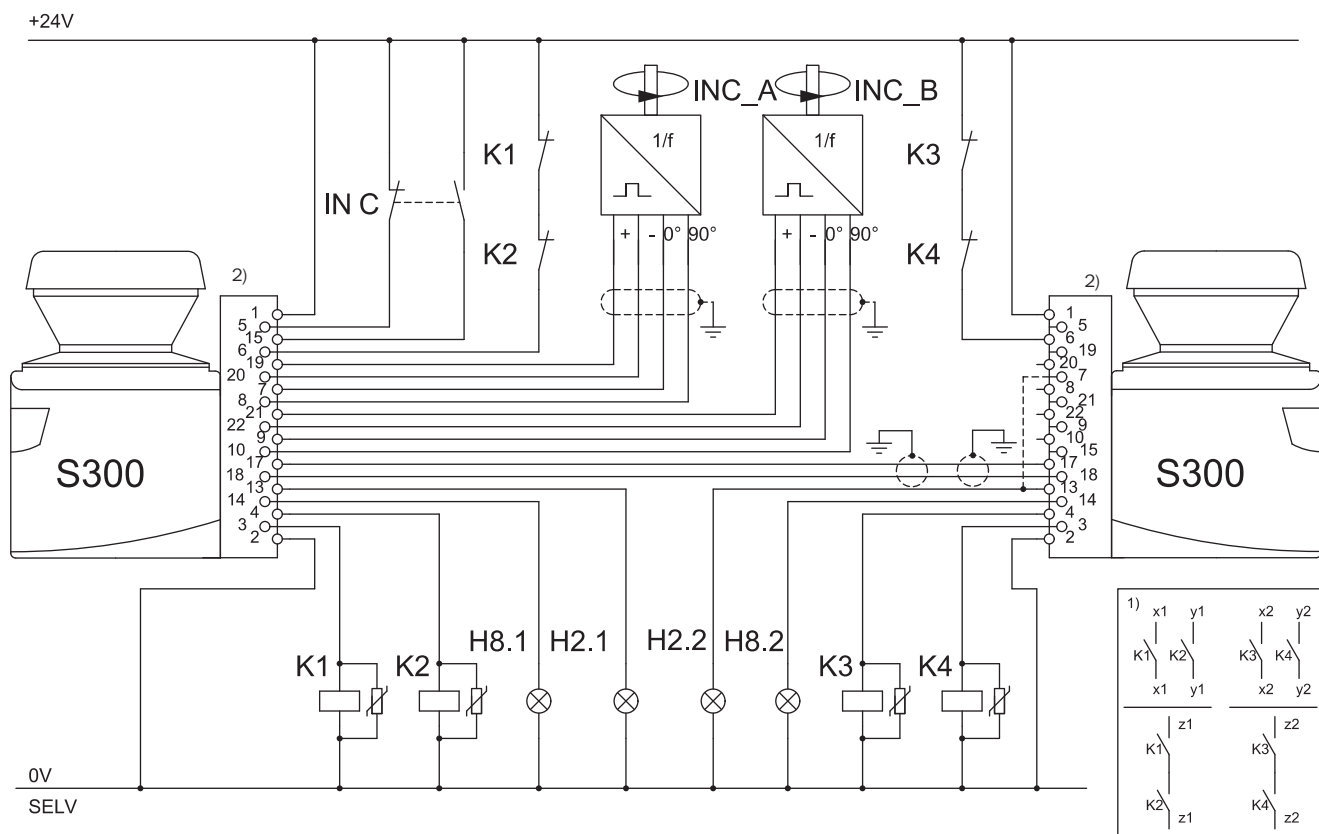


- S300 Professional in conjunction with relays/contactors
- Operating mode: with restart interlock and external device monitoring (EDM)
- Protective field switching using control input IN A and IN B

### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and taking the risk analysis into account.
- 2) Functional earth (FE): To achieve the specified EMC safety, the functional earth (FE) must be connected (e.g., to the central earth star point on the vehicle or the system).

Protective field switching between two S300s with static and dynamic inputs

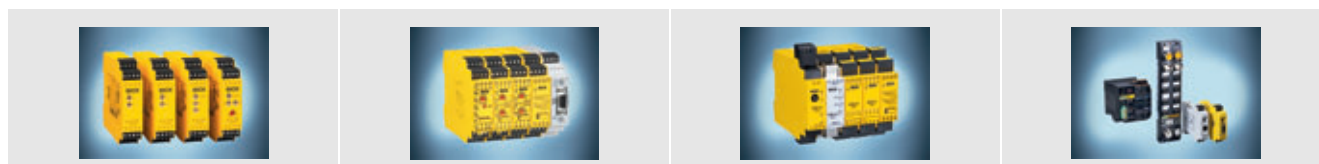


- S300 Professional with S300 Professional in master/slave connection with relays/contactors
- Operating mode: with restart interlock and external device monitoring
- Dynamic protective field switching by the incremental encoders A and B on the master
- Static protective field switching using the control input IN C on the master
- The protective fields affect the related OSSDs on master or slave

**Comments**

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and taking the risk analysis into account.
- 2) Functional earth (FE): To achieve the specified EMC safety, the functional earth (FE) must be connected (e.g., to the central earth star point on the vehicle or the system).




sens:Control – safe control solutions






Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	-	-	Mounting kit 1a	2034324
		For rear mounting on wall or machine with protection of optics cover	-	-	Mounting kit 1b	2034325
		-	Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
	Mounting plate	-	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303


### System plugs

Figure	Usage	Connection type	Number of cores	Cable length	Type	Part no.
	Not for use with incremental encoders	Without cable	-	-	SX0B-A0000G	2032807
		Pre-assembled	15	5 m	SX0B-B1505G	2034264
				10 m	SX0B-B1510G	2034265
	For use with incremental encoders	Without cable	-	-	SX0B-A0000J	2032856
		Pre-assembled	11	5 m	SX0B-B1105J	2032857
				10 m	SX0B-B1110J	2032858

### Connecting cables


Figure	Cable type	Number of cores	Type	Part no.
	By the meter	15	Connection cable	6030795
		-	EFI connection cable	6029448

### Cable gland


Figure	Usage	Size of the cable gland	Permissible cable diameter	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	5308757



**Configuration connection cables**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

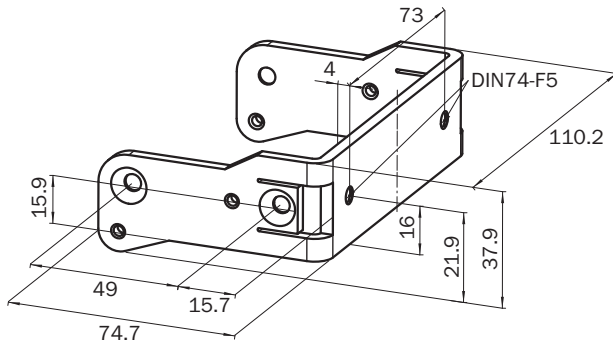
**Other**

Figure	Description	Items supplied	Type	Part no.
	Spare part set optic cover	With replacement seal and screws	Spare part set optic cover	2039248
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353

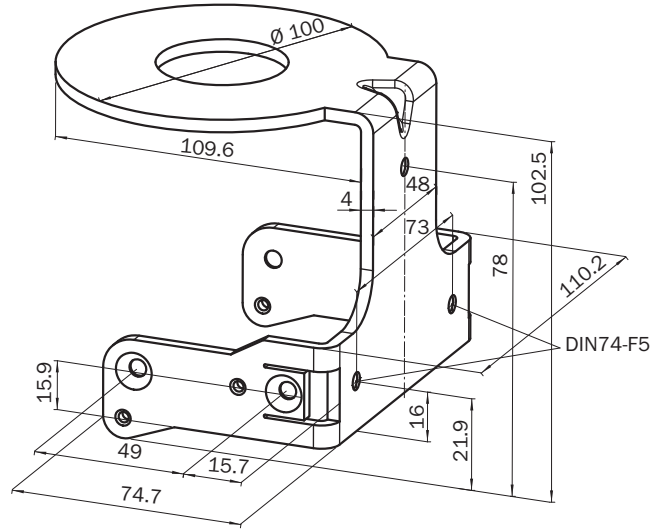
Dimensional drawings mounting systems

D

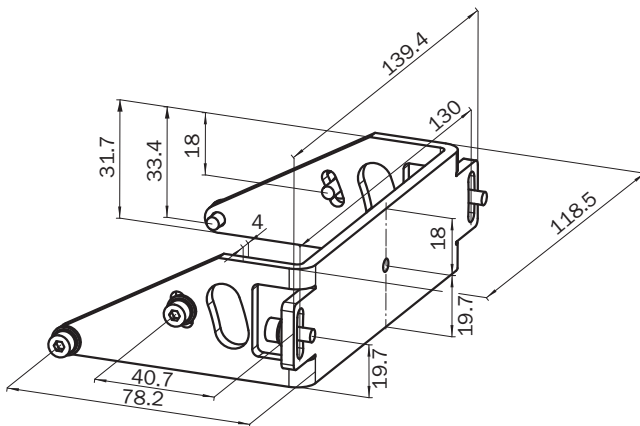
Mounting kit 1a



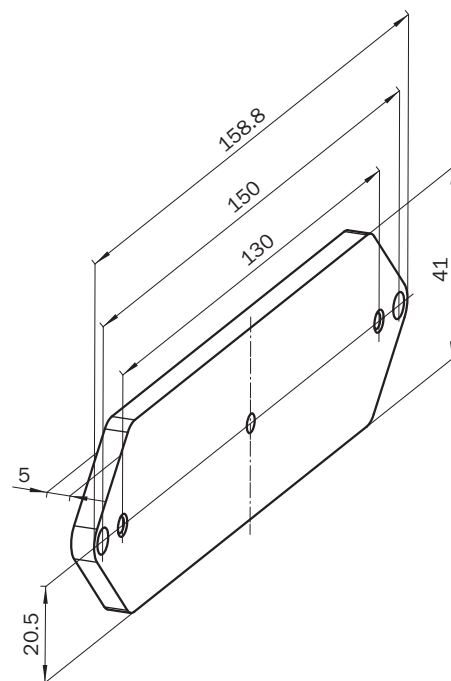
Mounting kit 1b



Mounting kit 2



Mounting kit 3



Dimensions in mm

## Technical data overview

Protective field range, radial	2 m
Warning field range	8 m (at 30 % reflectivity)
Number of field sets	2
Scan angle	270°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Response time	80 ms

## Product description

Compact safety laser scanner for complete safety.

The S300 Advanced is the system of choice particularly for applications with changing operating positions, e.g., insertion stations, robots, moving workbenches and more.

- 2 protective/warning fields

- Possibility of connecting two S300 units to form a single system
- Static protective field switching
- Multi-system "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

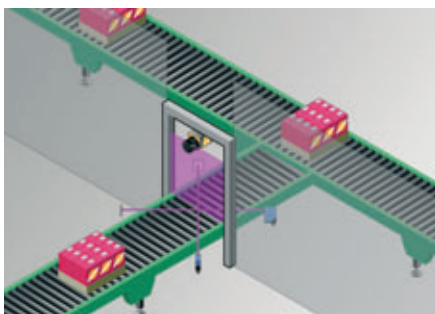
Combined with SICK safe control solutions

→ For more combinations, see annex

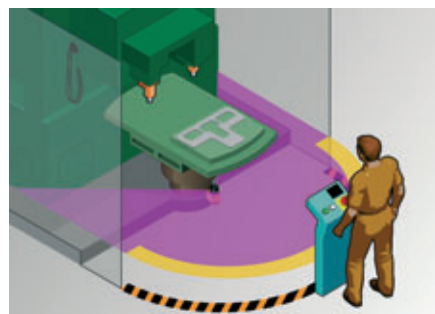
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

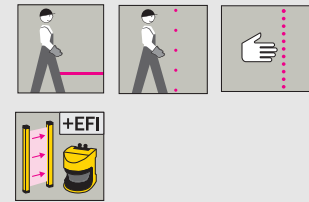
- Automated Guided Vehicles (AGVs)
- Production lines
- Machining centers
- Entry/exit stations (gates)
- Robot cells
- Overhead monorail transport systems



Access protection with differentiation between man and material (muting alternative)



Hazardous area protection on a rotary table



- Extremely compact design
- Scanning angle 270°
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)
- Stand-by input



Further information	Page
→ Ordering information	D-78
→ Technical specifications	D-78
→ Dimensional drawings	D-80
→ Connection diagrams	D-82
→ Accessories	D-83
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S300

- Safety laser scanner
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "important information"

The system plug has to be ordered separately!

Type	Part no.
S30B-2011CA	1026821

## D

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 und 1040.11, IEC 60825-1:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$5.29 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Optics cover material	Polycarbonate
Optics cover surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	102 mm x 152 mm x 105 mm
Weight	1.2 kg

### Functional data

Scan angle	270°
Protective field range, radial	2 m
Reflectivity	1.8 % > 1000 % ... reflectors
Response time	80 ms
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Angular resolution	0.5°
Protective field supplement	100 mm
Warning field range	8 m (at 30 % reflectivity)
Distance measuring range	30 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 30 V DC)
Power consumption	0.33 A (24 V DC) <sup>1)</sup> 1.65 A <sup>2)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Static switching signals	1, dual-channel
Standby	1
Number of outputs	
Safety outputs (OSSD)	2 x 250 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	38.4 kBaud
Safe device communication via EFI/SDL	
Transmission rate	500 kBaud
Cable length	50 m
Connection conductor cross-section	0.22 mm <sup>2</sup>

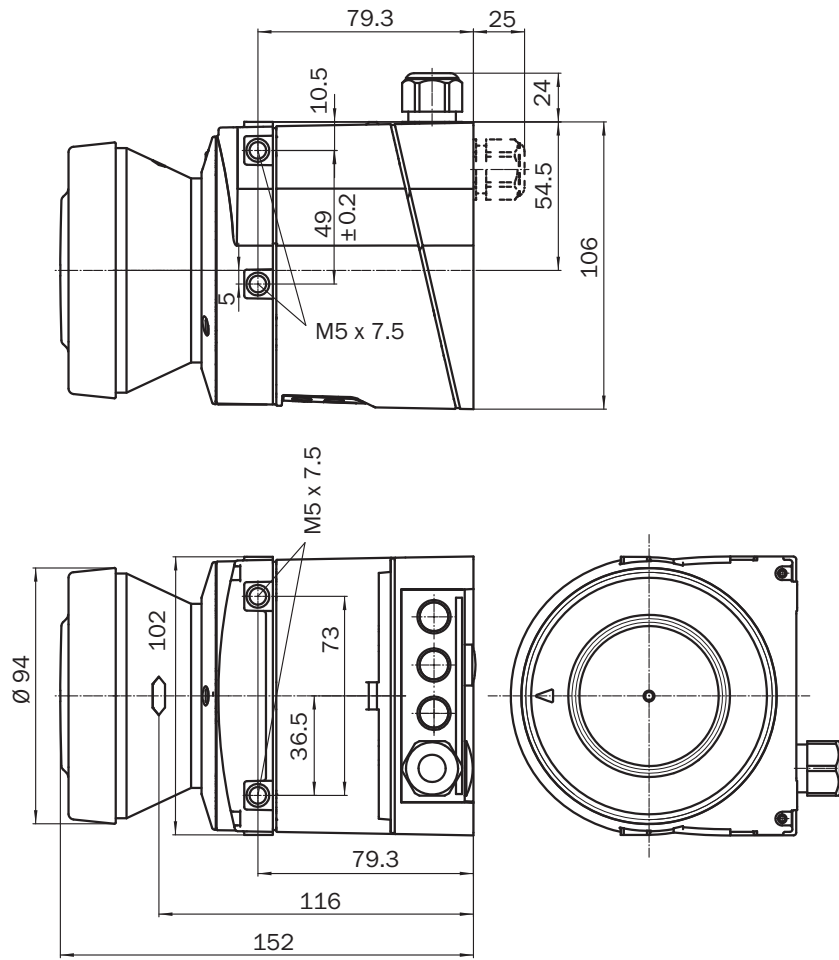
<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load

# Dimensional drawings

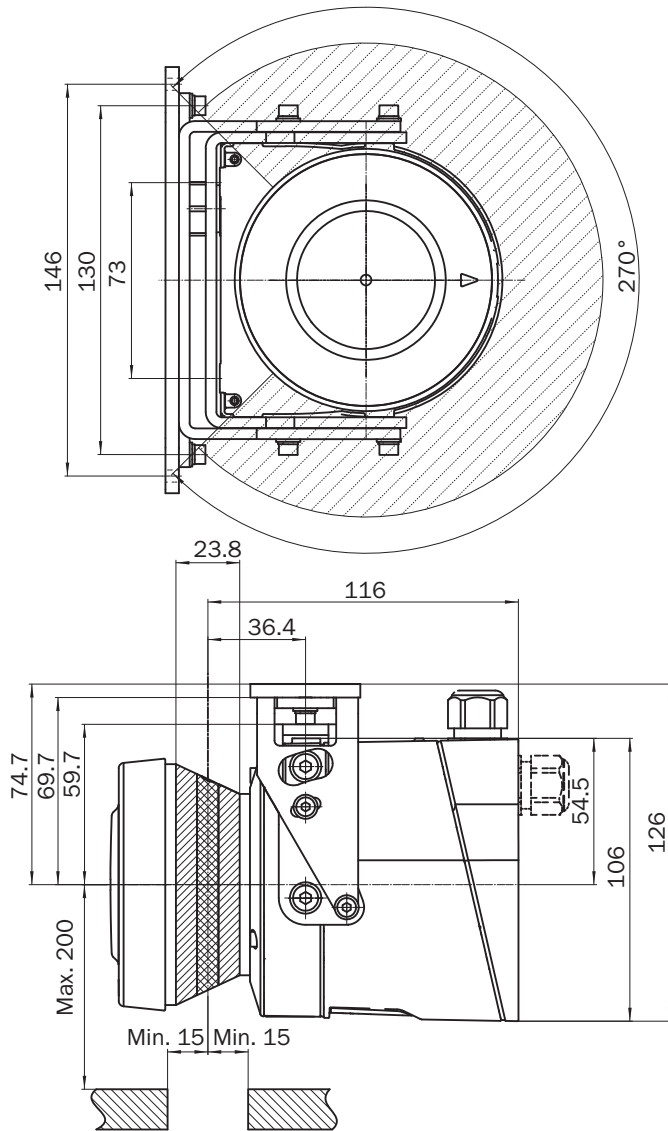
S300

D



Dimensions in mm

Scan plane origin



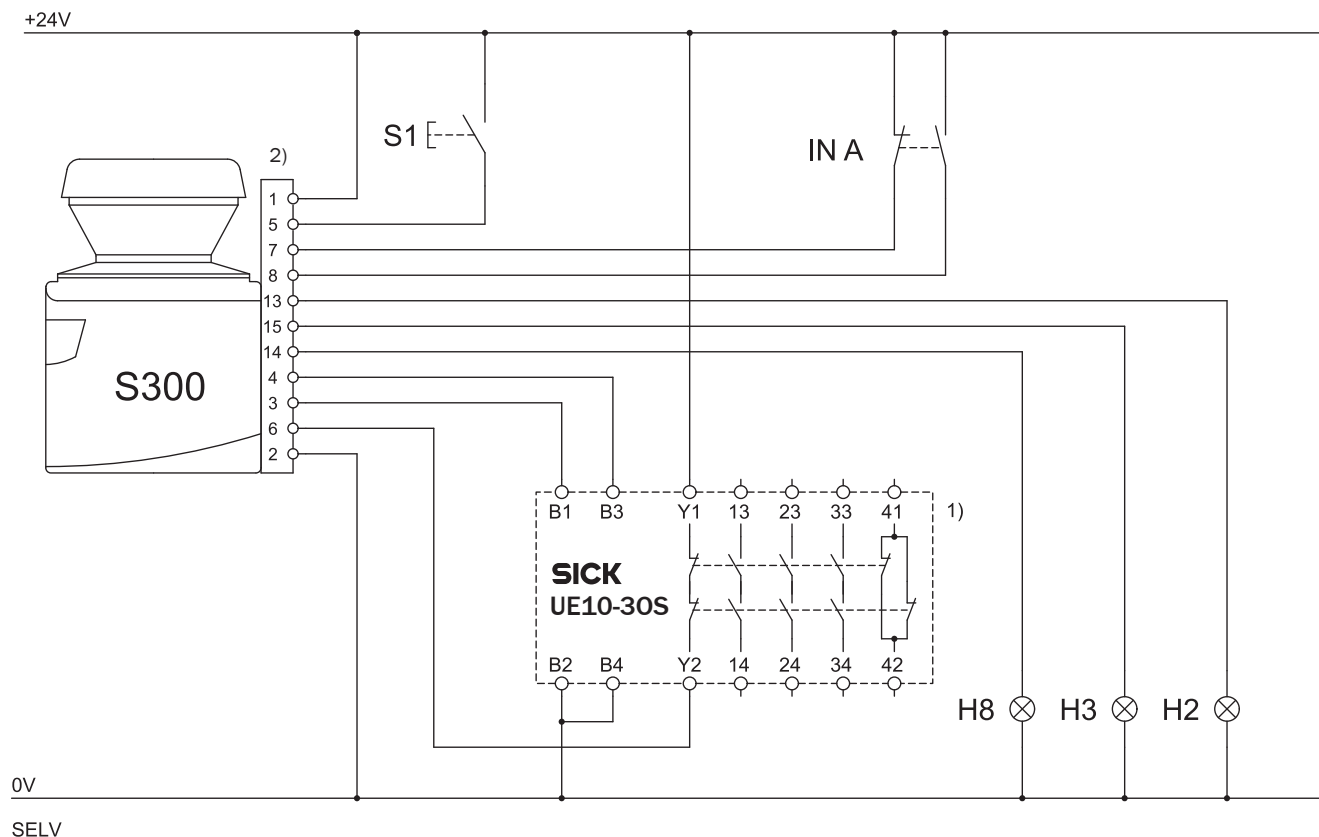
D

Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Protective field switching with one pair of static inputs



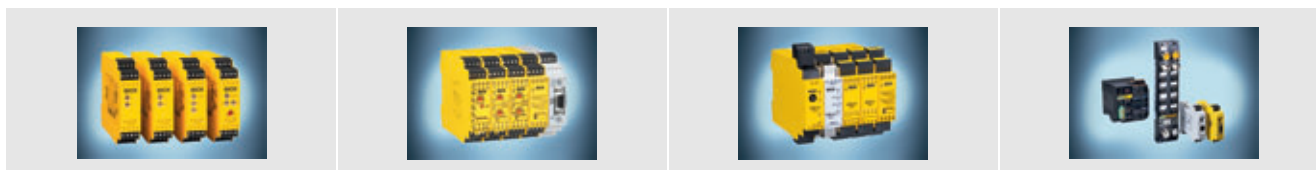
D

- S300 Advanced in conjunction with UE10-30S
- Operating mode: with restart interlock and external device monitoring (EDM)
- Protective field switching by means of control input IN A

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and taking the risk analysis into account.
- 2) Functional earth (FE): To achieve the specified EMC safety, the functional earth (FE) must be connected (e.g., to the central earth star point on the vehicle or the system).

## sens:Control – safe control solutions






Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).





## Accessories



### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	-	-	Mounting kit 1a	2034324
		For rear mounting on wall or machine with protection of optics cover	-	-	Mounting kit 1b	2034325
		-	Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
	Mounting plate	-	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303


### System plugs

Figure	Usage	Connection type	Number of cores	Cable length	Type	Part no.
	Not for use with incremental encoders	Without cable	-	-	SX0B-A0000G	2032807
		Pre-assembled	15	5 m	SX0B-B1505G	2034264
				10 m	SX0B-B1510G	2034265


### Connecting cables

Figure	Cable type	Number of cores	Type	Part no.
	By the meter	15	Connection cable	6030795
		-	EFI connection cable	6029448


### Cable gland

Figure	Usage	Size of the cable gland	Permissible cable diameter	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	5308757

### Configuration connection cables

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

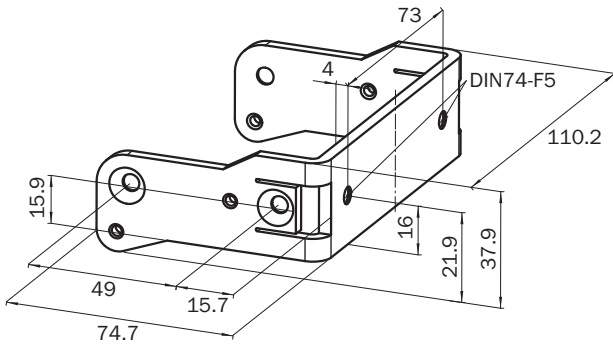
Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

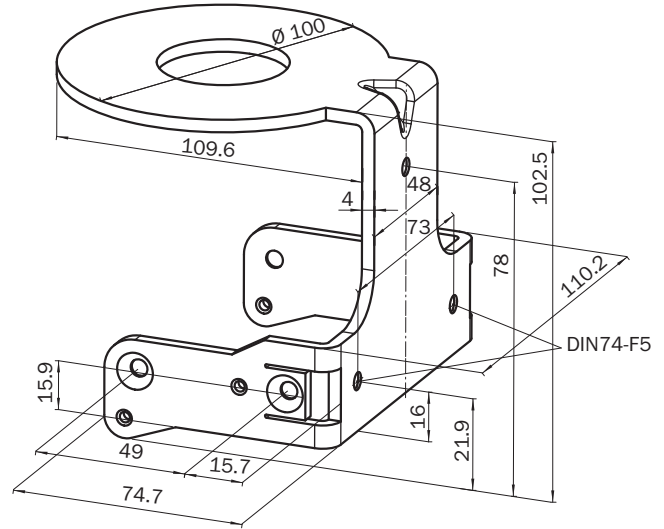
Figure	Description	Items supplied	Type	Part no.
	Spare part set optic cover	With replacement seal and screws	Spare part set optic cover	2039248
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353

Dimensional drawings mounting systems

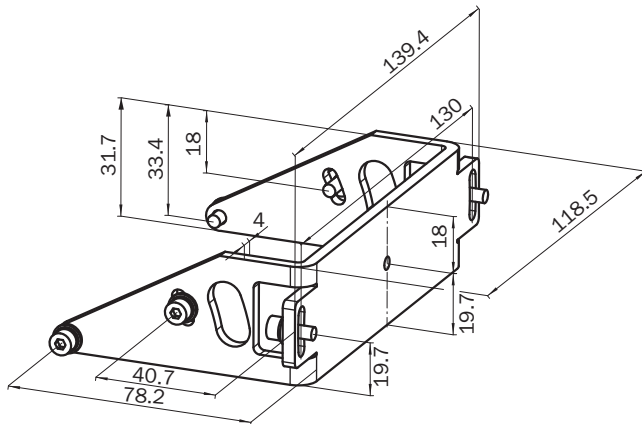
Mounting kit 1a



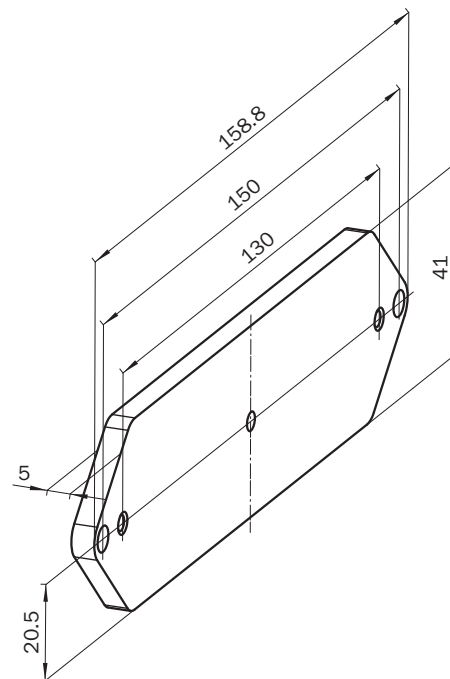
Mounting kit 1b



Mounting kit 2



Mounting kit 3



Dimensions in mm

D



D

- Extremely compact design
- Scanning angle 270°
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)
- Stand-by input



## Technical data overview

Protective field range, radial	2 m
Warning field range	8 m (at 30 % reflectivity)
Number of field sets	1
Scan angle	270°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Response time	80 ms

## Product description

High-end safety at an entry level price. The low-cost solution for simple requirements with one protective field and warning field. Ideal for the horizontal and vertical protection of hazardous areas and areas of access.

With adjustable object resolution as well as configurable "contour as reference."

- 1 protective and warning field
- Multi-system "Configuration & Diagnostic Software" CDS

## In-system added value

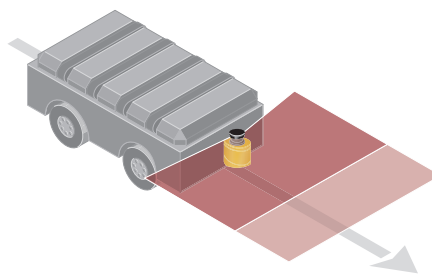
Combined with SICK safe control solutions

→ For more combinations, see annex

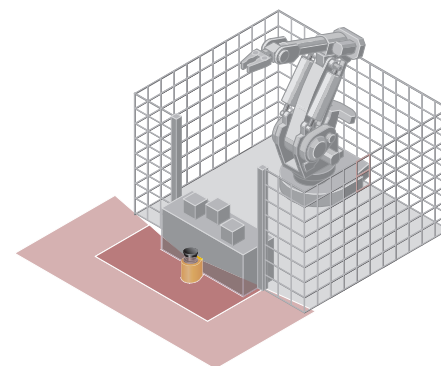
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Automated Guided Vehicles (AGVs)
- Production lines
- Machining centers
- Entry/exit stations (gates)
- Robot cells
- Overhead monorail transport systems



Hazardous area protection on an AGV with one direction of travel



Hazardous area protection on a robot cell

Further information	Page
→ Dimensional drawings	D-88
→ Connection diagrams	D-90
→ Accessories	D-91
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S300

- Safety laser scanner
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "important information"

The system plug has to be ordered separately!

Type	Part no.
S30B-2011BA	1026820

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 und 1040.11, IEC 60825-1:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$5.29 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Optics cover material	Polycarbonate
Optics cover surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	102 mm x 152 mm x 105 mm
Weight	1.2 kg

### Functional data

Scan angle	270°
Protective field range, radial	2 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	80 ms
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Angular resolution	0.5°
Protective field supplement	100 mm
Warning field range	8 m (at 30 % reflectivity)
Distance measuring range	30 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

Electrical data

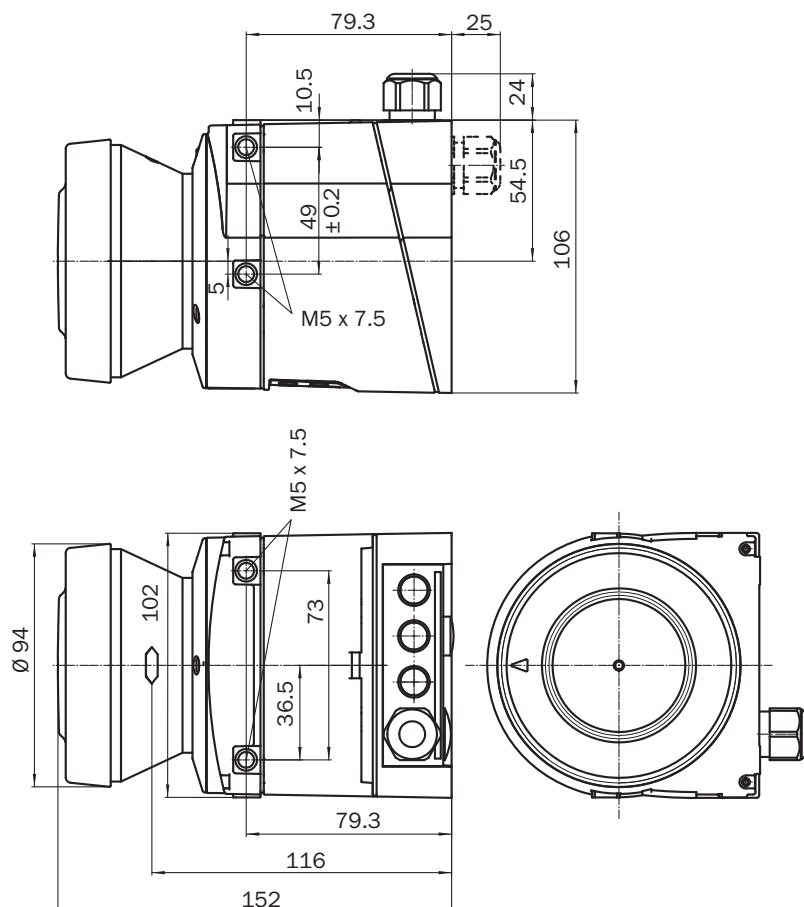
Connection type	Plug-in connection housing with screw Screw-type terminals	
Supply voltage $V_S$	24 V DC (16.8 V DC ... 30 V DC)	
Power consumption	0.33 A (24 V DC) <sup>1)</sup> 1.65 A <sup>2)</sup>	
Number of inputs	EDM Restart/Reset Standby	1 1 1
Number of outputs	Safety outputs (OSSD) Output for warning field Diagnostic output Restart/reset required	2 x 250 mA 1 x 100 mA 1 x 100 mA 1 x 100 mA
Configuration and diagnostics interface	RS-232	
	Transmission rate	38.4 kBaud

<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load

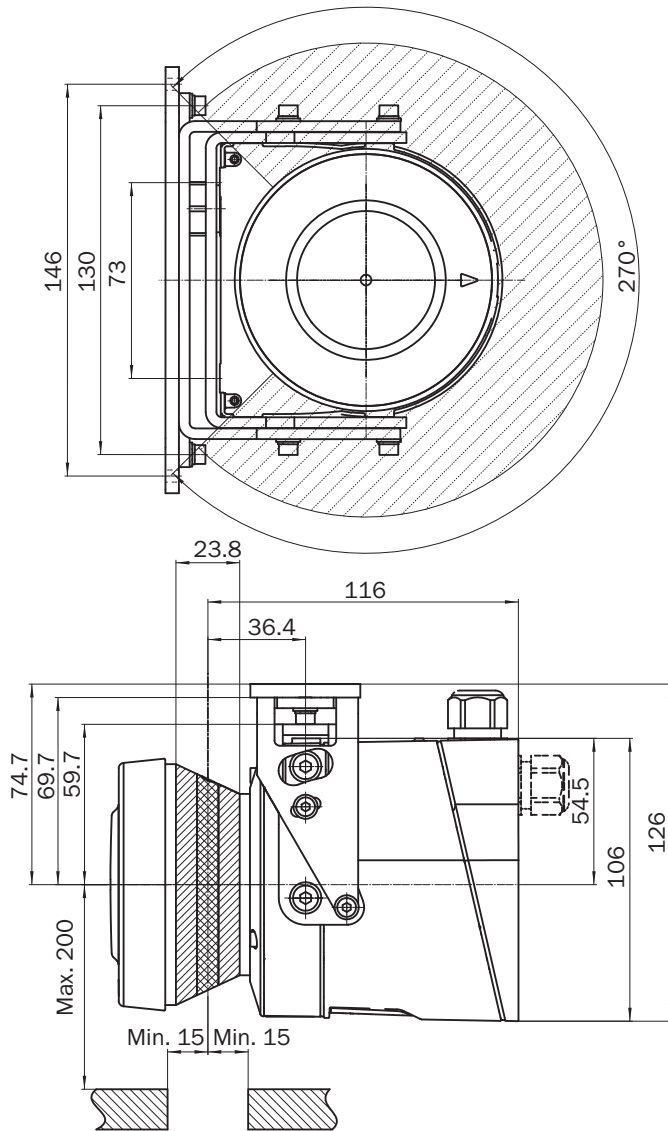
Dimensional drawings

S300



Dimensions in mm

Scan plane origin



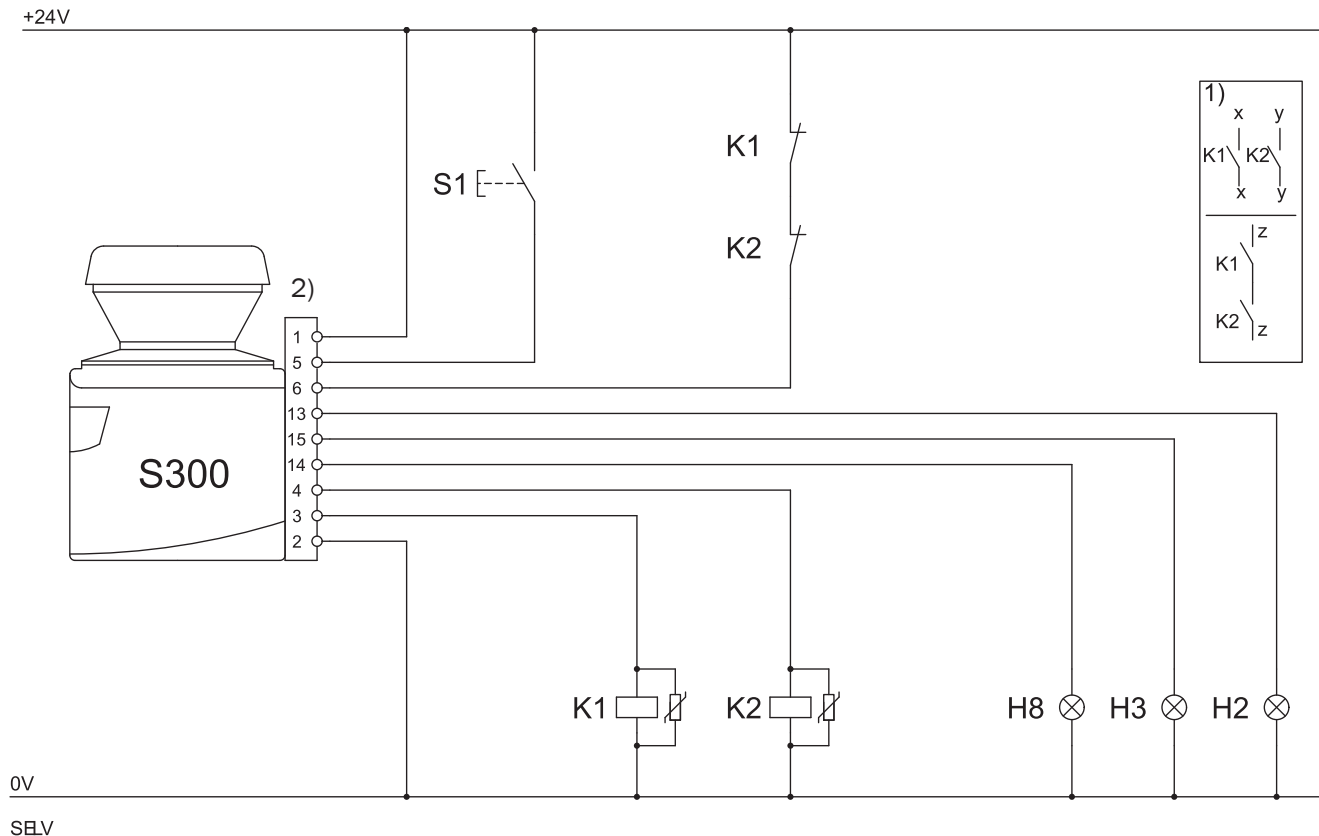
D

Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### With restart interlock and external device monitoring



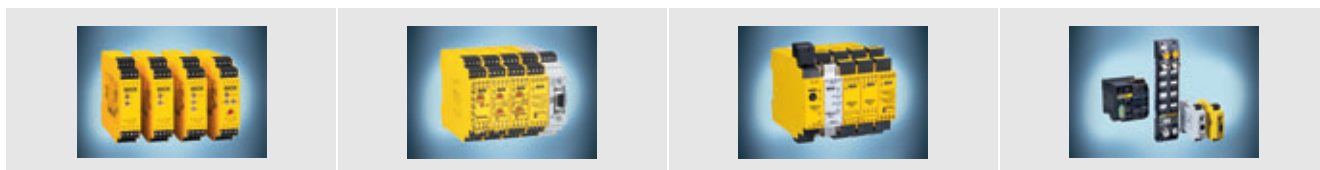
D

- S300 Standard in conjunction with relays/contactors
- Operating mode: with restart interlock and external device monitoring (EDM)

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and taking the risk analysis into account.
- 2) Functional earth (FE): To achieve the specified EMC safety, the functional earth (FE) must be connected (e.g., to the central earth star point on the vehicle or the system).

## sens:Control – safe control solutions






Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).





## Accessories

### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	-	-	Mounting kit 1a	2034324
		For rear mounting on wall or machine with protection of optics cover	-	-	Mounting kit 1b	2034325
		-	Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
	Mounting plate	-	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303


### System plug

Figure	Connection type	Number of cores	Cable length	Type	Part no.
	Without cable	-	-	SX0B-A0000G	2032807
	Pre-assembled	11	5 m	SX0B-B1105G	2032859
			10 m	SX0B-B1110G	2032860
			14 m	SX0B-B1114G	2047875
			20 m	SX0B-B1120G	2032861


### Connecting cable

Figure	Number of cores	Type	Part no.
	15	Connection cable	6030795

### Configuration connection cables

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

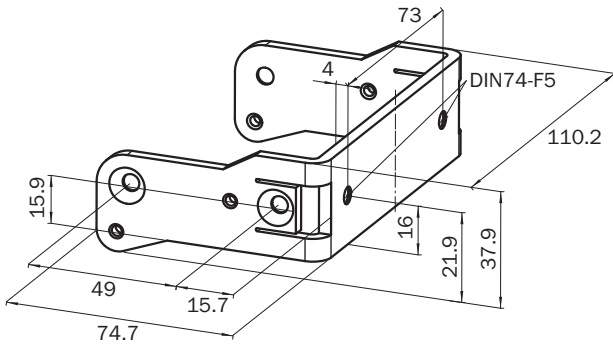
Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

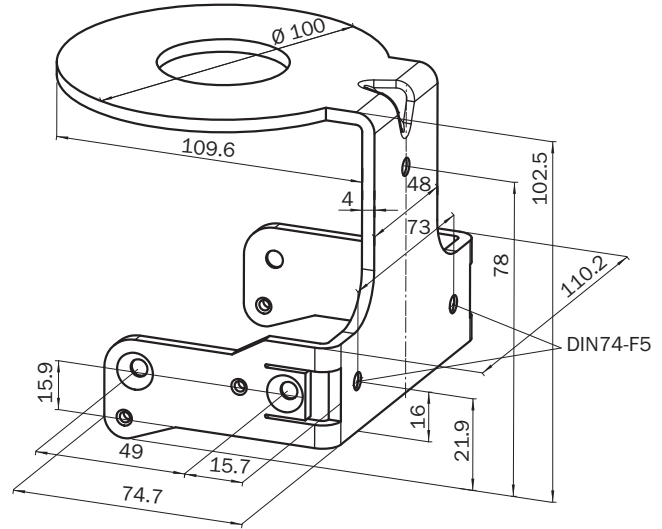
Figure	Description	Items supplied	Type	Part no.
	Spare part set optic cover	With replacement seal and screws	Spare part set optic cover	2039248
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353

Dimensional drawings mounting systems

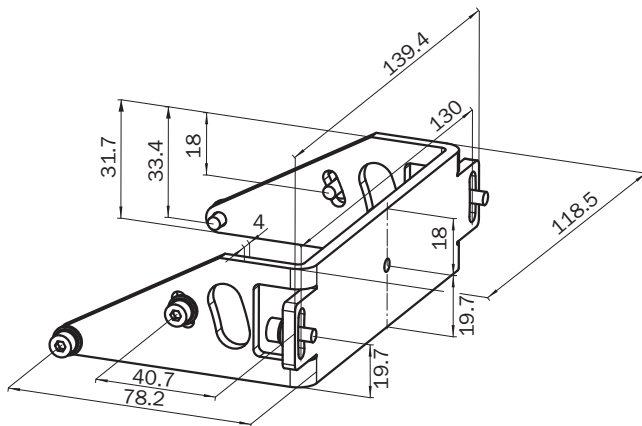
Mounting kit 1a



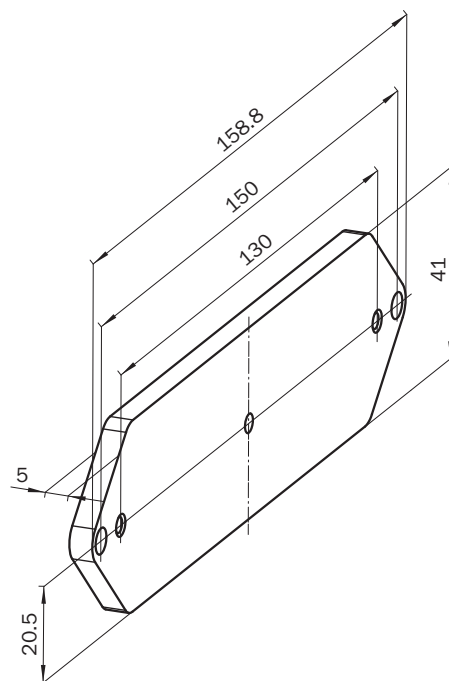
Mounting kit 1b



Mounting kit 2



Mounting kit 3



Dimensions in mm

D



D

- Extremely compact design
- Scanning angle 270°
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)
- Stand-by input



## Technical data overview

Protective field range, radial	2 m
Warning field range	8 m (at 30 % reflectivity)
Number of field sets	4
Scan angle	270°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Response time	80 ms

## Product description

The S300 Professional CMS is a safety laser scanner with expanded measured data output to support the navigation of small freely moving transport vehicles/AGV. It performs two tasks at the same time and saves expensive sensor technology and installation costs.

- Personnel protection and acquisition of the surrounding contour in one scanner
- Measured data output via RS-422 interface in real-time
- Reflector mark detection up to 20 m
- 4 switchable protective/warning fields
- Facility for connecting incremental encoder
- Possibility of connecting two S300 units to form a single system
- Multi-system "Configuration & Diagnostic Software" CDS
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

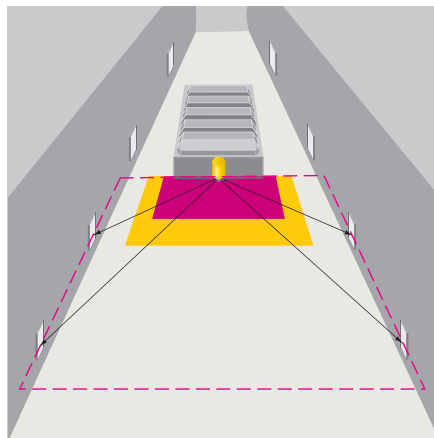
Combined with SICK safe control solutions

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Automated Guided Vehicles (AGVs)



Personnel protection and acquisition of the surrounding contour with integrated reflector detection

Further information	Page
→ Dimensional drawings	D-97
→ Connection diagrams	D-99
→ Accessories	D-101
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S300

- Safety laser scanner
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "important information"

The system plug has to be ordered separately!

Type	Part no.
S30B-2011DB	1041152

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 und 1040.11, IEC 60825-1:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 3 (IEC/EN 61496-3)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$5.29 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Optics cover material	Polycarbonate
Optics cover surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	102 mm x 152 mm x 105 mm
Weight	1.2 kg

### Functional data

Scan angle	270°
Protective field range, radial	2 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	80 ms
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Angular resolution	0.5°
Protective field supplement	100 mm
Warning field range	8 m (at 30 % reflectivity)
Distance measuring range	30 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 30 V DC)
Power consumption	0.33 A (24 V DC) <sup>1)</sup> 1.65 A <sup>2)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Static switching signals or dynamic encoder signals	2, dual-channel
Standby	1
Number of outputs	
Safety outputs (OSSD)	2 x 250 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	38.4 kBaud
Data interface	RS-422
Transmission rate	38.4 kBaud ... 500 kBaud
Safe device communication via EFI/SDL	
Transmission rate	500 kBaud
Cable length	50 m
Connection conductor cross-section	0.22 mm <sup>2</sup>

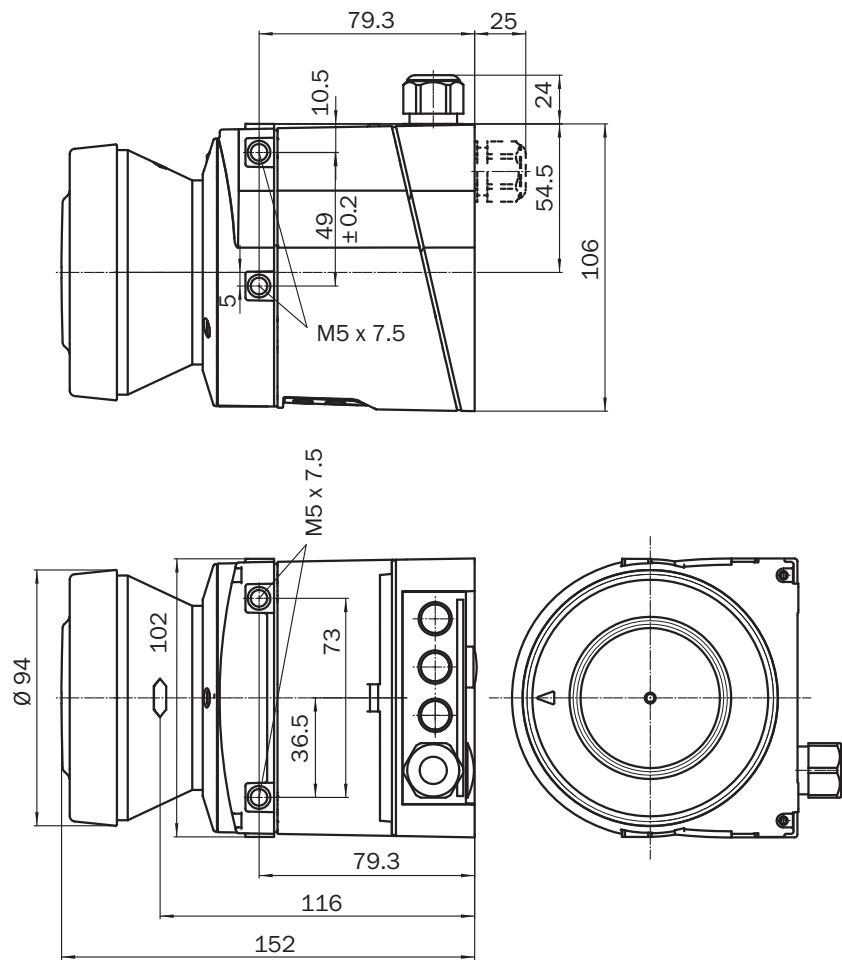
<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load

D

# Dimensional drawings

S300

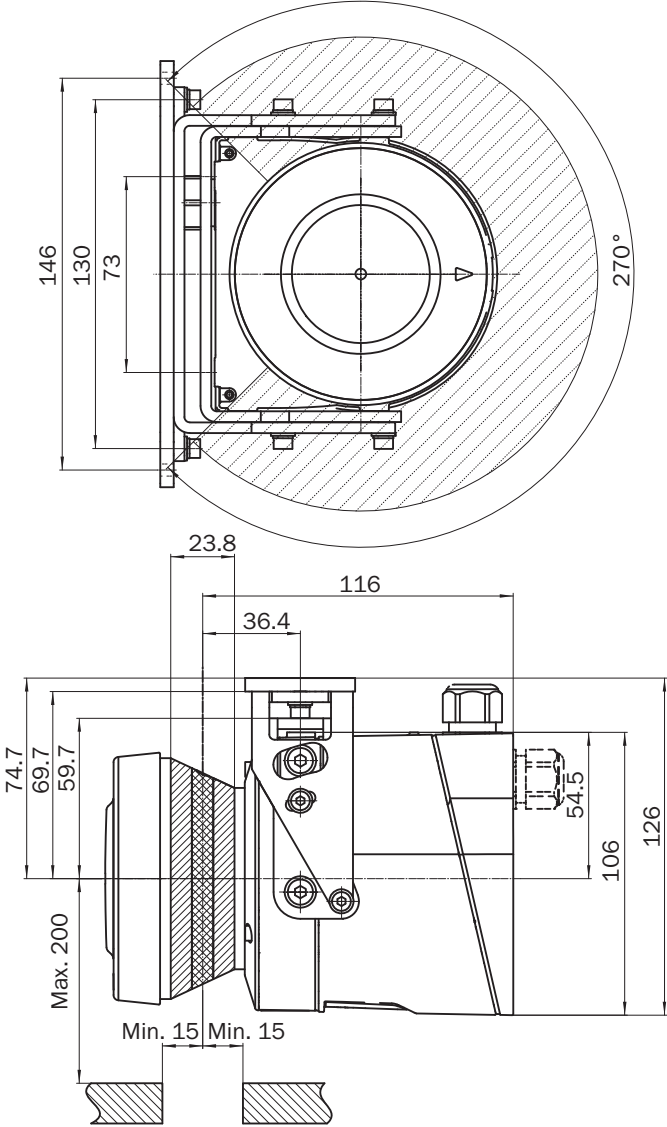


Dimensions in mm

D

Scan plane origin

D



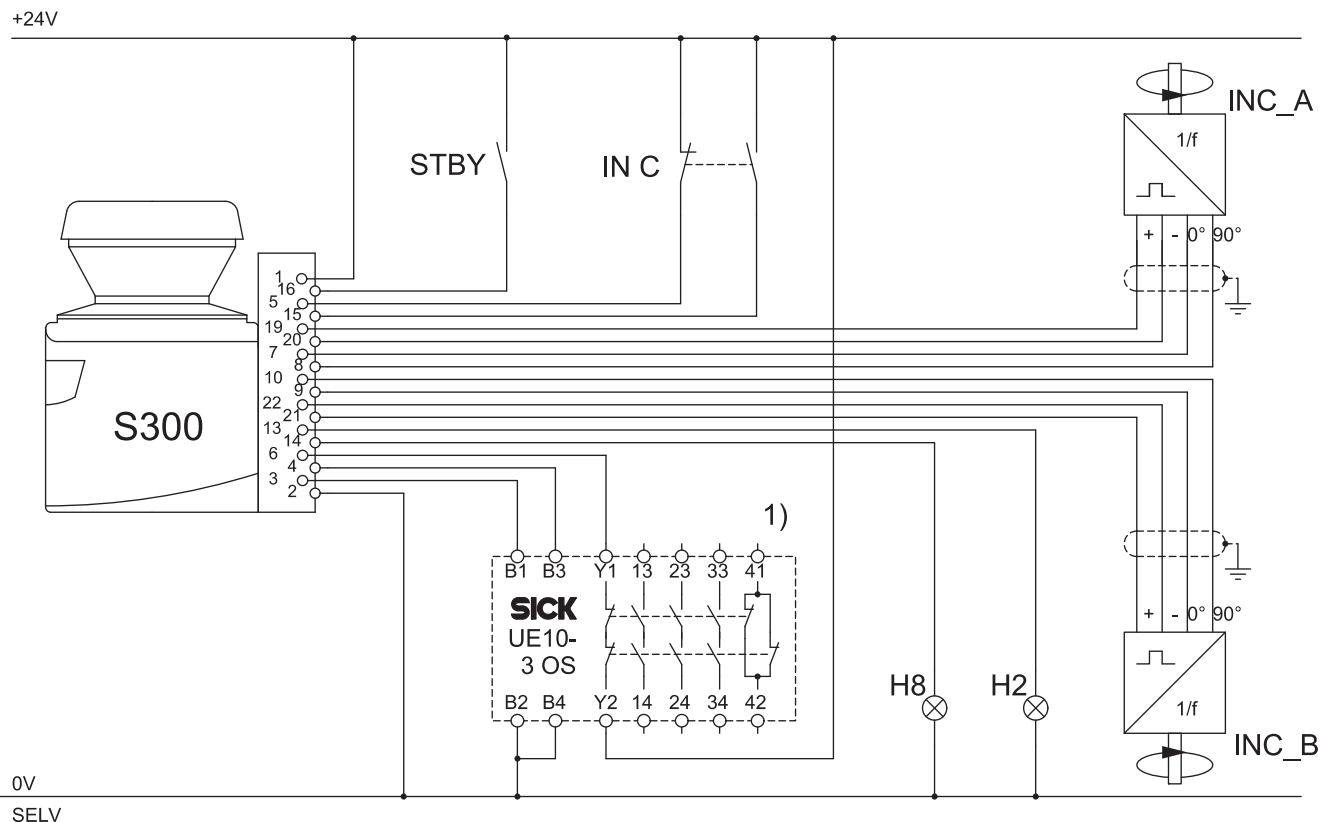
Dimensions in mm



## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Protective field switching with static and dynamic inputs



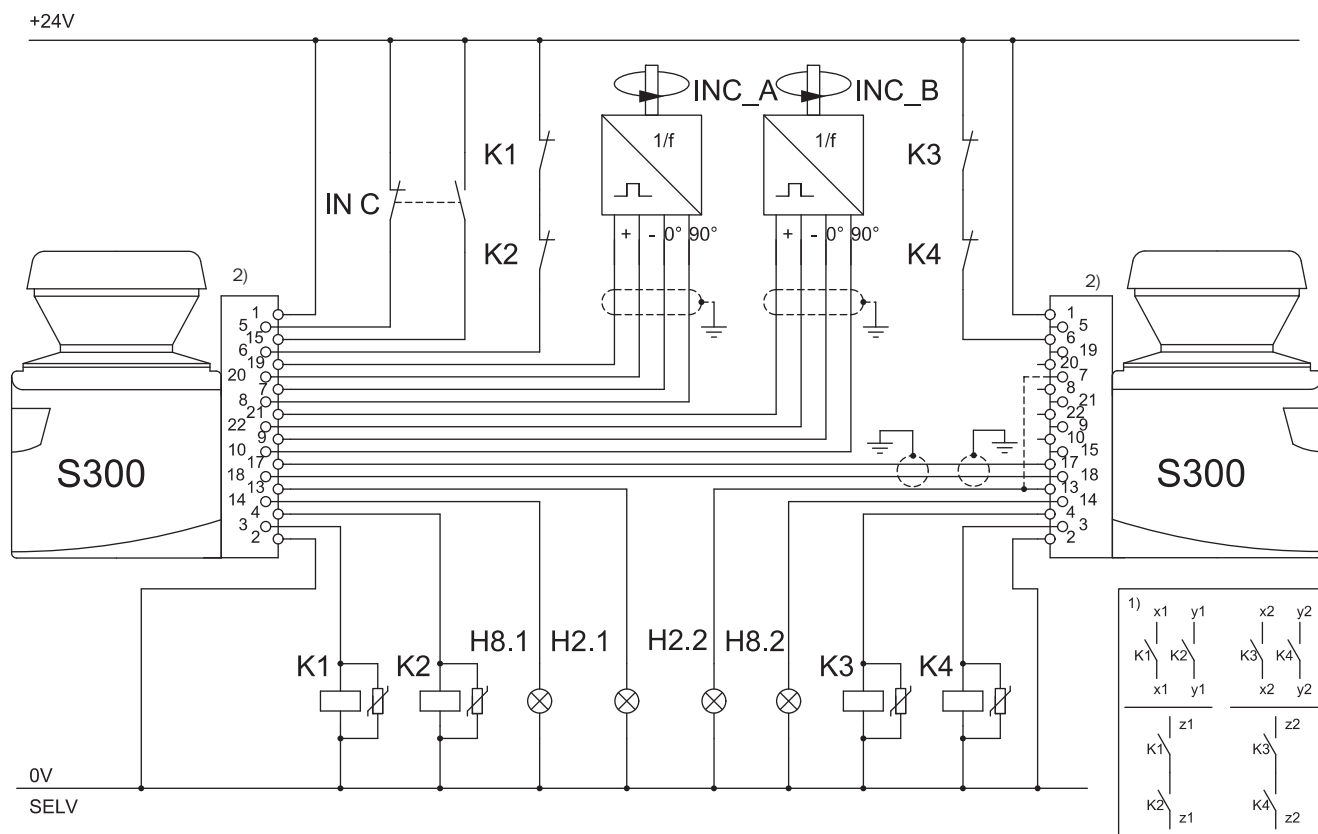
- S300 Professional CMS in conjunction with UE10-3OS
- Operating mode: without restart interlock, with external device monitoring (EDM)
- Dynamic protective field switching by the incremental encoders A and B
- Static protective field switching using the control input IN C

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and taking the risk analysis into account.
- 2) Functional earth (FE): To achieve the specified EMC safety, the functional earth (FE) must be connected (e.g., to the central earth star point on the vehicle or the system).

Protective field switching between two S300s with static and dynamic inputs

D

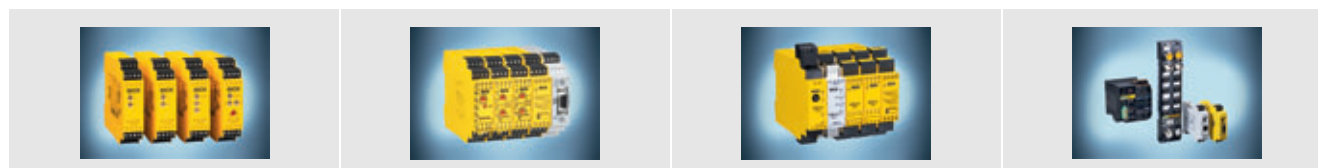


- S300 Professional CMS with S300 Professional CMS in master/slave connection with relays/contactors
- Operating mode: with restart interlock and external device monitoring
- Dynamic protective field switching by the incremental encoders A and B on the master
- Static protective field switching using the control input IN C on the master
- The protective fields affect the related OSSDs on master or slave

**Comments**

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and taking the risk analysis into account.
- 2) Functional earth (FE): To achieve the specified EMC safety, the functional earth (FE) must be connected (e.g., to the central earth star point on the vehicle or the system).




sens:Control – safe control solutions






Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	-	-	Mounting kit 1a	2034324
		For rear mounting on wall or machine with protection of optics cover	-	-	Mounting kit 1b	2034325
		-	Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
	Mounting plate	-	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303


### System plugs

Figure	Usage	Connection type	Number of cores	Cable length	Type	Part no.
	Not for use with incremental encoders	Without cable	-	-	SX0B-A0000G	2032807
		Pre-assembled	15	5 m	SX0B-B1505G	2034264
				10 m	SX0B-B1510G	2034265
	For use with incremental encoders	Without cable	-	-	SX0B-A0000J	2032856
		Pre-assembled	11	5 m	SX0B-B1105J	2032857
				10 m	SX0B-B1110J	2032858


### Connecting cables

Figure	Cable type	Number of cores	Type	Part no.
	By the meter	15	Connection cable	6030795
		-	EFI connection cable	6029448


### Cable gland

Figure	Usage	Size of the cable gland	Permissible cable diameter	Part no.
	For EFI connections	M12	3 mm ... 6.5 mm	5308757

**Configuration connection cables**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

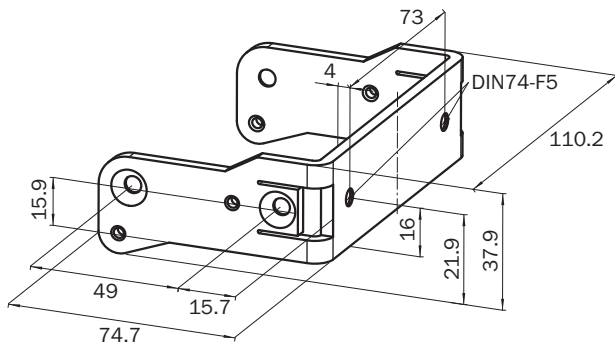
Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

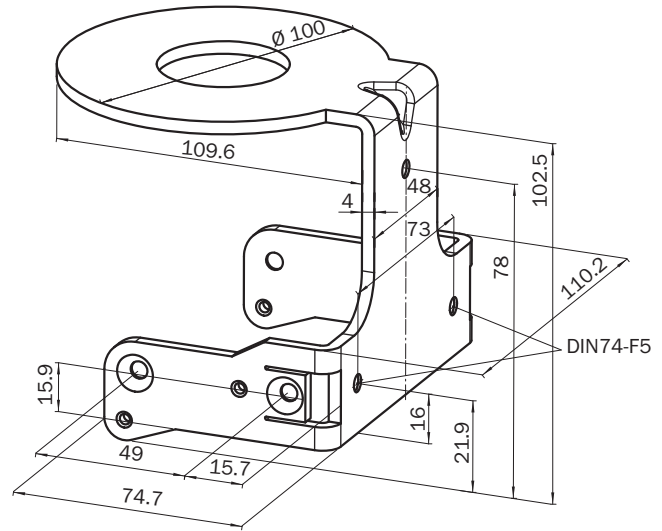
Figure	Description	Items supplied	Type	Part no.
	Spare part set optic cover	With replacement seal and screws	Spare part set optic cover	2039248
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353

Dimensional drawings mounting systems

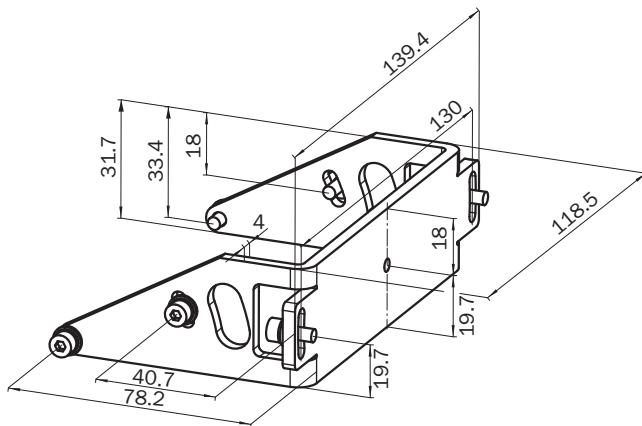
Mounting kit 1a



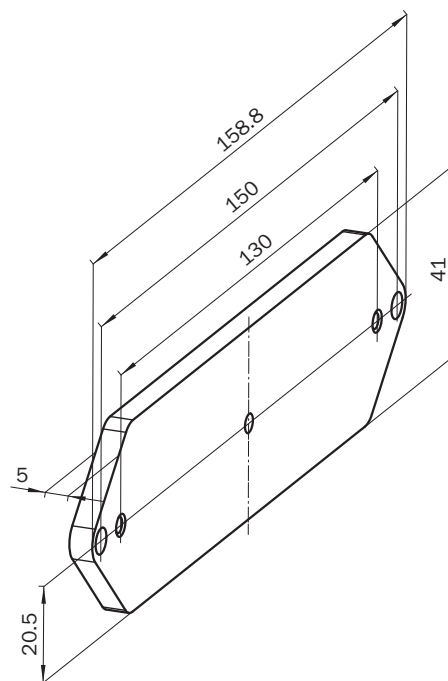
Mounting kit 1b



Mounting kit 2



Mounting kit 3



Dimensions in mm

D



D

- Extremely compact design
- Scanning angle 270°
- Selectable resolution
- Certified for vertical use
- 7-segment display
- Integrated external device monitoring (EDM)
- Stand-by input



## Technical data overview

Protective field range, radial	1.5 m
Warning field range	8 m (at 30 % reflectivity)
Number of field sets	1
Scan angle	270°
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Response time	80 ms

## Product description

The S200 is a state-of-the-art solution that meets type 2 requirements, in accordance with IEC/EN 61496. It offers a high level of functionality at a low cost.

The S200 is flexible and easy to integrate, can be used horizontally and vertically, and has adjustable object resolution as well as the "contour as reference" function.

- 1 protective/warning field (field set)
- Uniform "Configuration & Diagnostic Software" CDS

## In-system added value

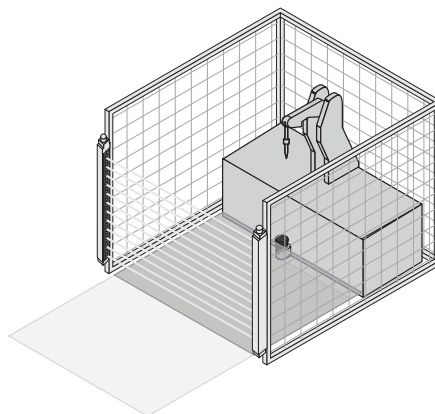
Combined with SICK safe control solutions

→ For more combinations, see annex

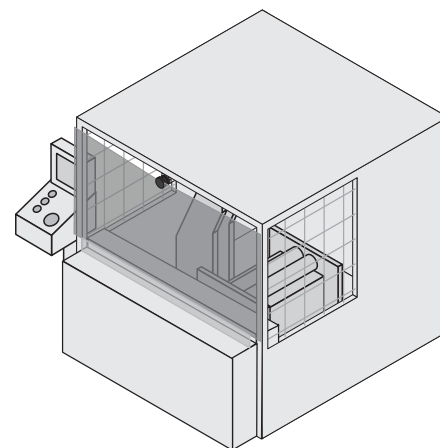
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Machining centers
- Entry/exit stations (gates)
- Robot cells
- Overhead monorail transport systems



Point-of-operation guarding on a robot cell using S200 in conjunction with safety light curtain



Hazardous point protection on a small automatic placement machine

Further information	Page
→ Dimensional drawings	D-107
→ Connection diagrams	D-109
→ Accessories	D-110
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S200

- Safety laser scanner
- Operating instructions and CDS (Configuration & Diagnostic Software) on CD-ROM
- Adhesive label "important information"

The system plug has to be ordered separately!

Type	Part no.
S20B-1011BA	1026823

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 und 1040.11, IEC 60825-1:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	II (DIN VDE 0160, DIN EN 50178)
Safety related parameters	
Type	Type 2 (IEC/EN 61496-1)
Safety integrity level	SIL1 (IEC 61508) SILCL1 (EN 62061)
Category	Category 2 (EN ISO 13849)
Test rate (internal test)	12/s (EN ISO 13849)
Maximum demand rate	7/min (EN ISO 13849) <sup>1)</sup>
Performance level	PL c (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$5.29 \times 10^{-8}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 1021 (yellow)
Housing material	Aluminum diecast
Optics cover material	Polycarbonate
Optics cover surface finish	Outside with scratch-resistant coating
Dimensions (W x H x D)	102 mm x 152 mm x 105 mm
Weight	1.2 kg

<sup>1)</sup> Between two demands on a safety-related response of the device at least 100 internal or external tests must be carried out.

## Functional data

Scan angle	270°
Protective field range, radial	1.5 m
Reflectivity	1.8 % ... > 1000 %, reflectors
Response time	80 ms
Resolution	30 mm, 40 mm, 50 mm, 70 mm, selectable
Angular resolution	0.5°
Protective field supplement	100 mm
Warning field range	8 m (at 30 % reflectivity)
Distance measuring range	30 m
Number of multiple samplings	2 ... 16, configurable via CDS
Delay of automatic reset	2 s ... 60 s, configurable

## Electrical data

Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 30 V DC)
Power consumption	0.33 A (24 V DC) <sup>1)</sup> 1.65 A <sup>2)</sup>
Number of inputs	
EDM	1
Restart/Reset	1
Standby	1
Number of outputs	
Safety outputs (OSSD)	2 x 250 mA
Output for warning field	1 x 100 mA
Diagnostic output	1 x 100 mA
Restart/reset required	1 x 100 mA
Configuration and diagnostics interface	RS-232
Transmission rate	38.4 kBaud

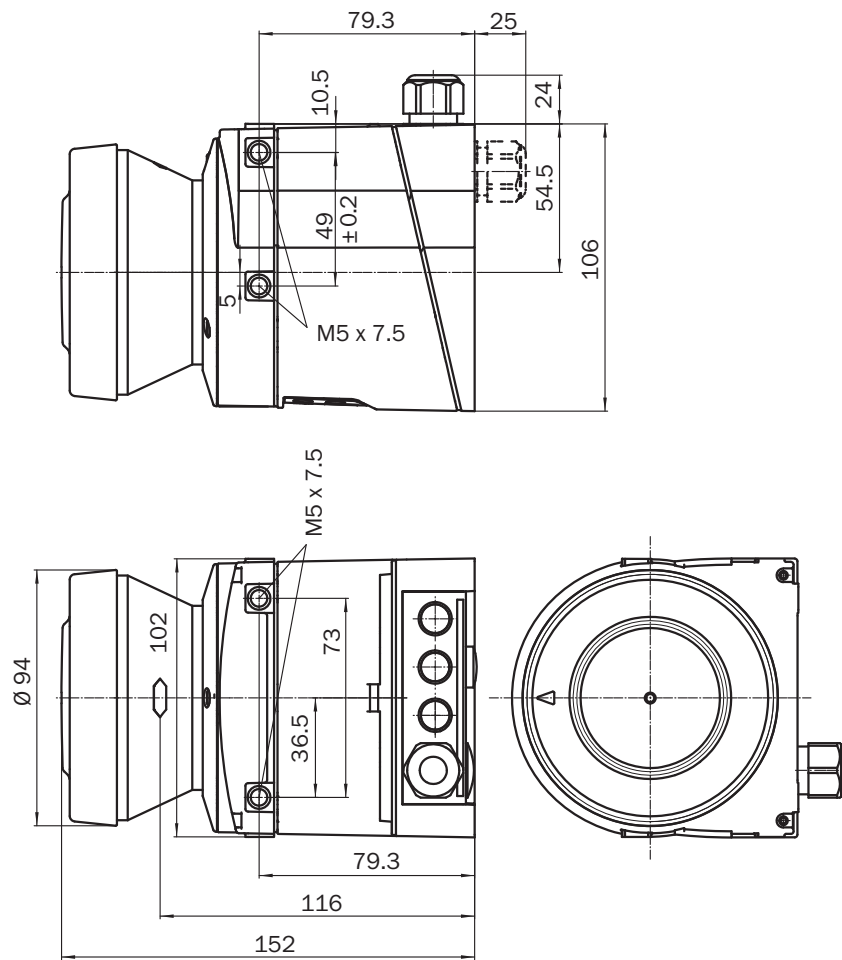
<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load



# Dimensional drawings

S200

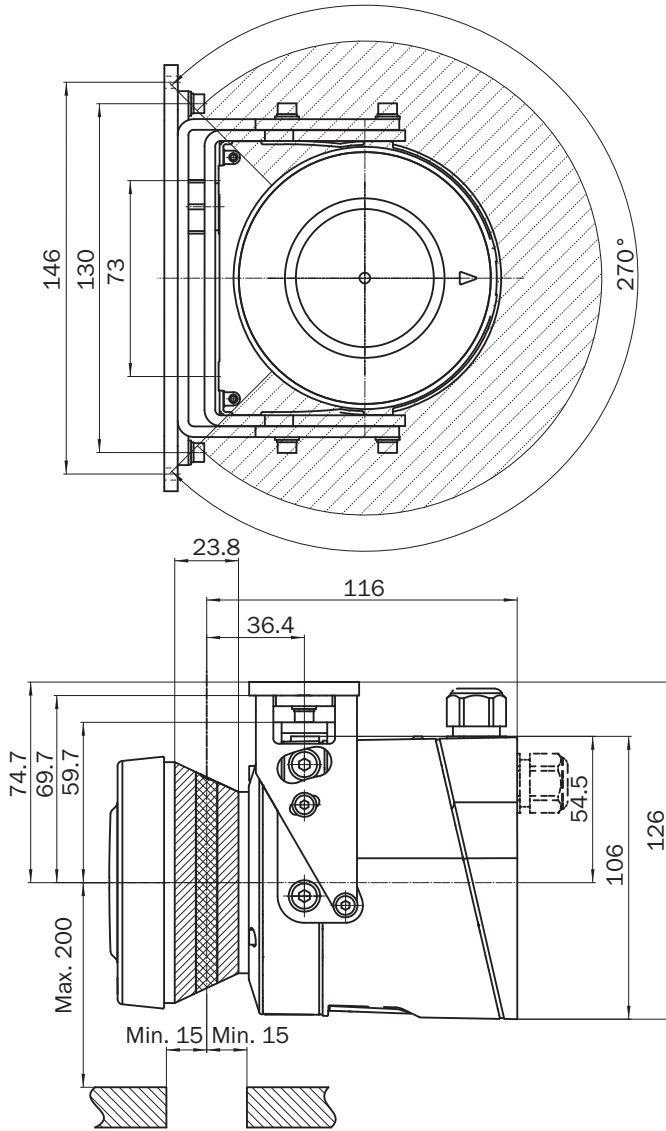


Dimensions in mm

D

Scan plane origin

D

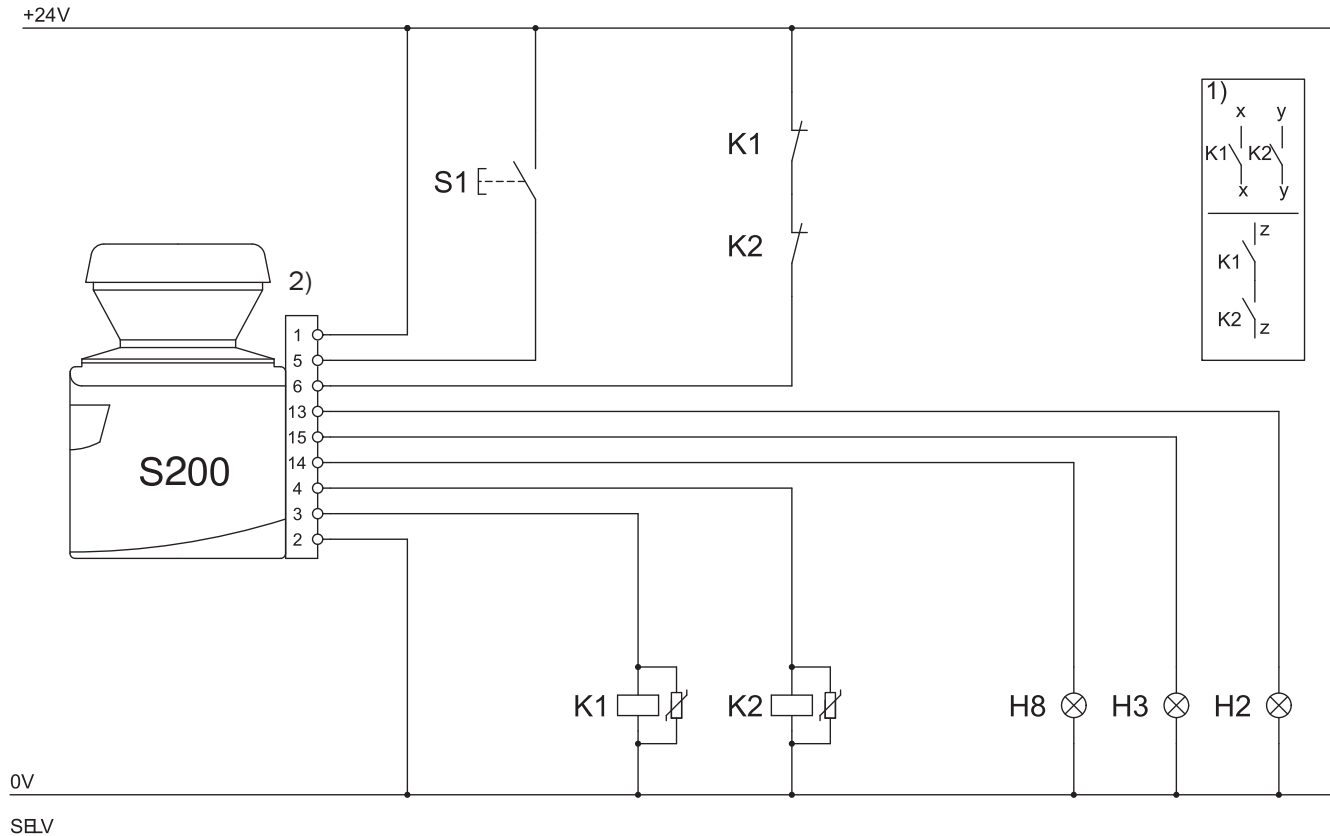


Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### With restart interlock and external device monitoring

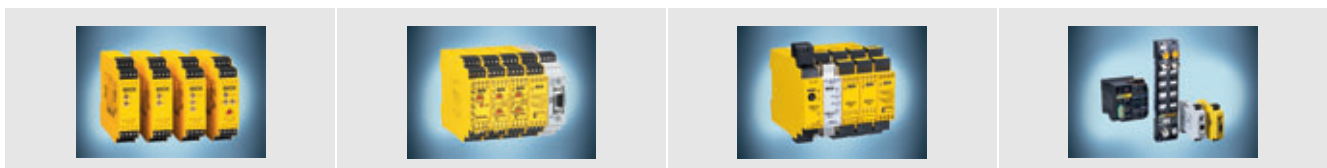


- S200 in conjunction with relays/contactors
- Operating mode: with restart interlock and external device monitoring (EDM)

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and taking the risk analysis into account.
- 2) Functional earth (FE): To achieve the specified EMC safety, the functional earth (FE) must be connected (e.g., to the central earth star point on the vehicle or the system).




## sens:Control – safe control solutions





Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	-	-	Mounting kit 1a	2034324
		For rear mounting on wall or machine with protection of optics cover	-	-	Mounting kit 1b	2034325
		-	Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
	Mounting plate	-	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303


### System plugs

Figure	Connection type	Number of cores	Cable length	Type	Part no.
	Without cable	-	-	SX0B-A0000G	2032807
	Pre-assembled	11	5 m	SX0B-B1105G	2032859
			10 m	SX0B-B1110G	2032860
			20 m	SX0B-B1120G	2032861


### Connecting cable

Figure	Number of cores	Type	Part no.
	15	Connection cable	6030795

### Configuration connection cables

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

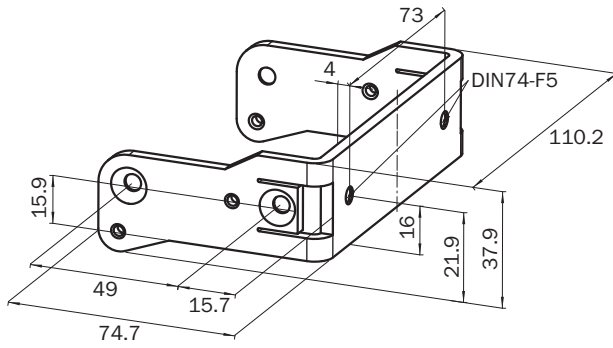
Figure	Description	Items supplied	Type	Part no.
	Spare part set optic cover	With replacement seal and screws	Spare part set optic cover	2039248
	Cloth for cleaning the front screen	-	Optical cleaning cloth	4003353

D

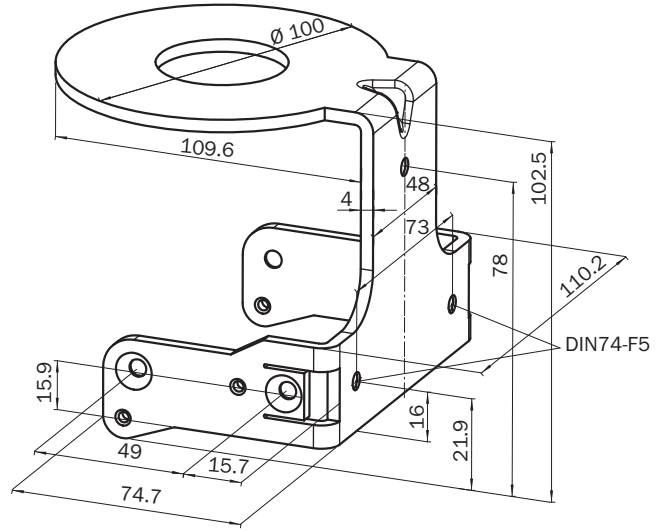
Dimensional drawings mounting systems

D

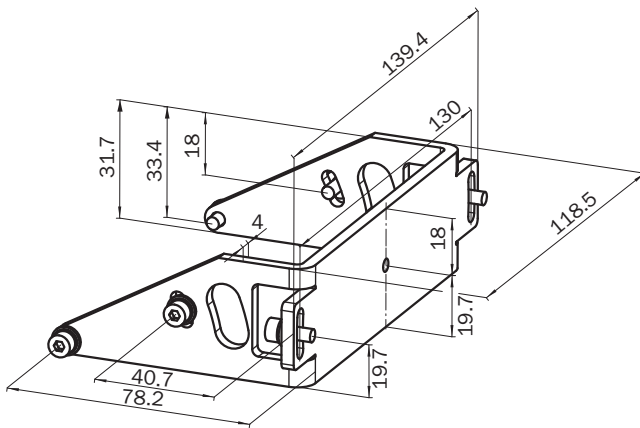
Mounting kit 1a



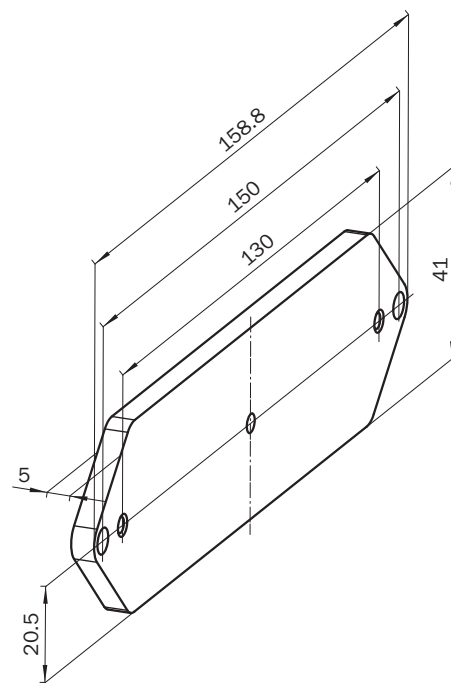
Mounting kit 1b



Mounting kit 2



Mounting kit 3



Dimensions in mm

## Technical data overview

Number of field sets	1
Switching field range	10 m
Scan angle	270°
Fixed object resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Variable object resolution	10 mm, depending on distance
Response time	40 ms

## Product description

Damaged goods, or defective machines and equipment can impede or stop processes – causing expensive downtime. The S100 laser scanner offers an efficient and economical way to prevent this. The S100 is not safety rated and was specially developed for collision avoidance in areas where people are not present or to help solve customers' supplemental monitoring applications. The S100 detects problems, moni-

tors distances and prevents potential collisions.

The ideal solution for logistics and factory automation:

- Preventing collisions on machines, in plants and with vehicles
- Controlling doors and gates
- Monitoring transfer and stacks of material
- Checking loads and occupancy
- Approach protection

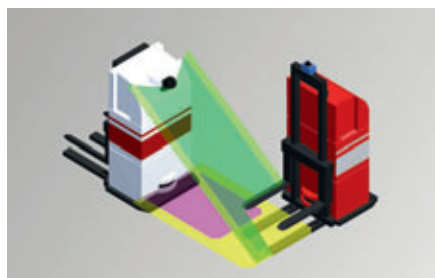
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Industrial trucks
- Automated Guided Vehicles (AGVs)
- Shelving access devices
- Shunting/towing vehicles
- Machine tools
- Doors/gates
- Assembly plant



Space check and collision prevention during storage by shelving storage and retrieval units



Collision prevention on automated guided vehicles



- Compact housing
- Tough, IP 65 design
- Stand-by input
- Selectable object resolution
- 7-segment display
- Integrated parameter memory in system plug
- CANopen interface
- Low energy consumption



Further information	Page
→ Ordering information	D-114
→ Technical specifications	D-114
→ Dimensional drawings	D-115
→ Connection diagrams	D-117
→ Accessories	D-118
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S100

- Laser scanner
- Operating instructions and CDS – S100 (Configuration & Diagnostic Software – S100) on CD-ROM
- Adapter for cable entry from M12 to M16
- EMC-proof M16 cable gland

The system plug has to be ordered separately!

Type	Part no.
S10B-9011BA	1042266

## D

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 und 1040.11, IEC 60825-1:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	2 (DIN VDE 0160, DIN EN 50178)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 9005 (black)
Housing material	Aluminum diecast
Optics cover material	Polycarbonate
Optics cover surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	102 mm x 152 mm x 105 mm
Weight	1.2 kg

### Functional data

Scan angle	270°
Switching field range	10 m
Reflectivity	1.8 % ... > 1000 %, Reflectors
Response time	40 ms
Fixed object resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Variable object resolution	10 mm, depending on distance
Angular resolution	0.5°



## Electrical data

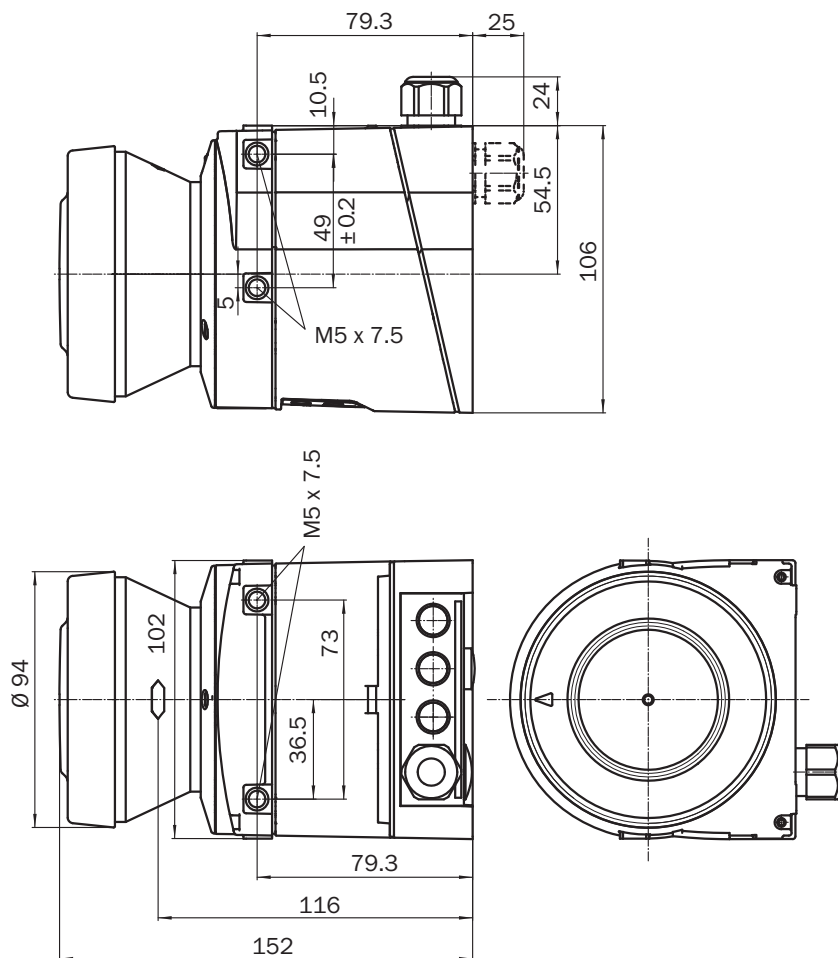
Connection type	Plug-in connection housing with screw Screw-type terminals
Supply voltage $V_S$	24 V DC (16.8 V DC ... 30 V DC)
Power consumption	0.33 A (24 V DC) <sup>1)</sup> 1.65 A <sup>2)</sup>
Number of outputs	
Switching outputs (Q1 and Q2)	2
Diagnostic outputs ("Q1 inverted" and "Q2 inverted")	2
Diagnostic output (error/contamination)	1
Fieldbus interface	CANopen®
Transmission rate	10 kbit/s ... 1000 kbit/s
Configuration and diagnostics interface	RS-232
Transmission rate	38.4 kBaud

<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load

## Dimensional drawings

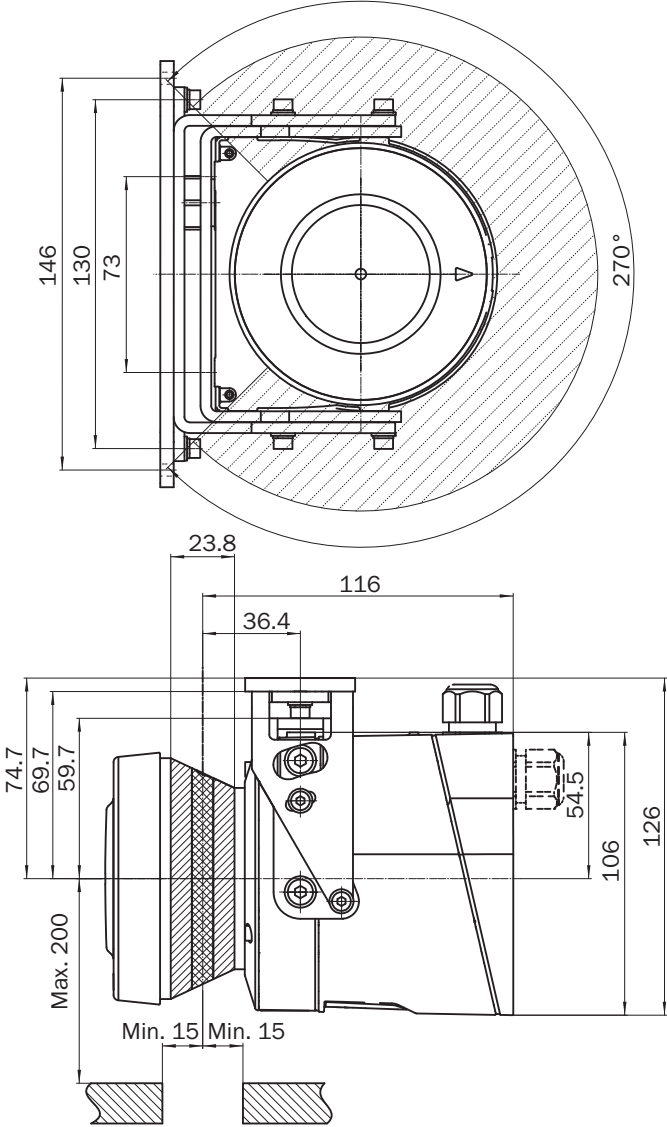
## S100



Dimensions in mm

Scan plane origin

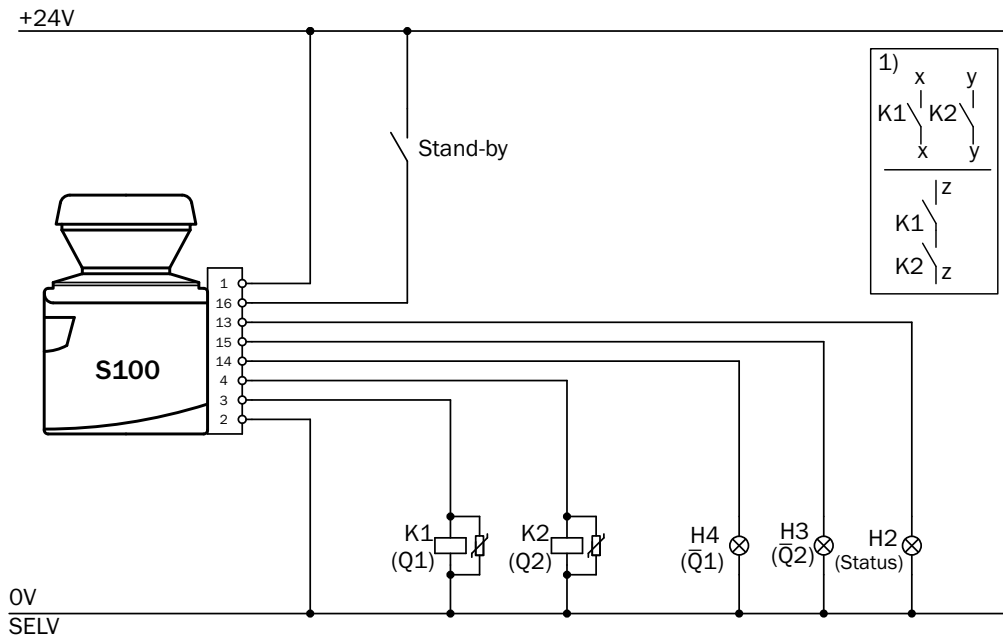
D



Dimensions in mm

# Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)






S100 Standard in connection with relays/contactors on the switching outputs Q1 and Q2. The LEDs H4 and H3 connected to the outputs "Q1 inverted" and "Q2 inverted" indicate the sta-

tus of the related switching output. The LED H2 connected to the application diagnostic output indicates the state (error/contamination) of the S100.



D

## Accessories



### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	-	-	Mounting kit 1a	2034324
		For rear mounting on wall or machine with protection of optics cover	-	-	Mounting kit 1b	2034325
		-	Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
	Mounting plate	-	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303



### System plugs

Figure	Connection type	Number of cores	Cable length	Type	Part no.
	Without cable	-	-	SX0B-A0000G	2032807
	Pre-assembled	11	5 m	SX0B-B1105G	2032859
			10 m	SX0B-B1110G	2032860
			14 m	SX0B-B1114G	2047875
			20 m	SX0B-B1120G	2032861


### Connection cables

Figure	Cable type (acc. to standard)	Number of cores	Type	Part no.
	-	15	Connection cable	6030795
	2 x 2 x 0.22 mm <sup>2</sup>	-	CANopen cable	6035263


### Cable glands

Figure	Usage	Size of the cable gland	Permissible cable diameter	Type	Part no.
	For cable entry from M12 to M16	M12/M16	-	Expansion M12 to M16	5320690
	For CANopen connections, EMC-proof	M16	3 mm ... 6.5 mm	Cable gland M16	5318530


**Configuration connection cables**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS-S100 (Configuration & Diagnostic Software – S100) on CD-ROM including online documentation and operating instructions in German and English	CDS-S100	2042818

**Cleaning agent**

Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

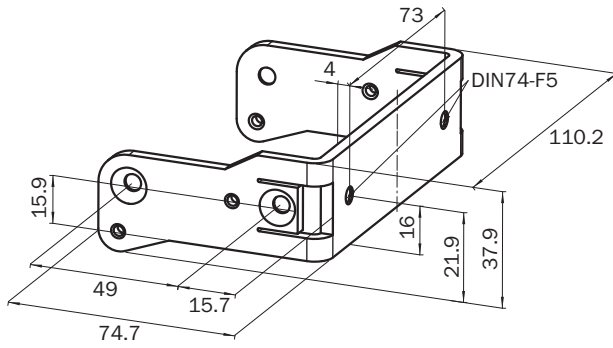
**Other**

Figure	Description	Items supplied	Type	Part no.
	Spare part set optic cover	With replacement seal and screws	Spare part set optic cover	2039248
	Cloth for cleaning the front screen	–	Optical cleaning cloth	4003353

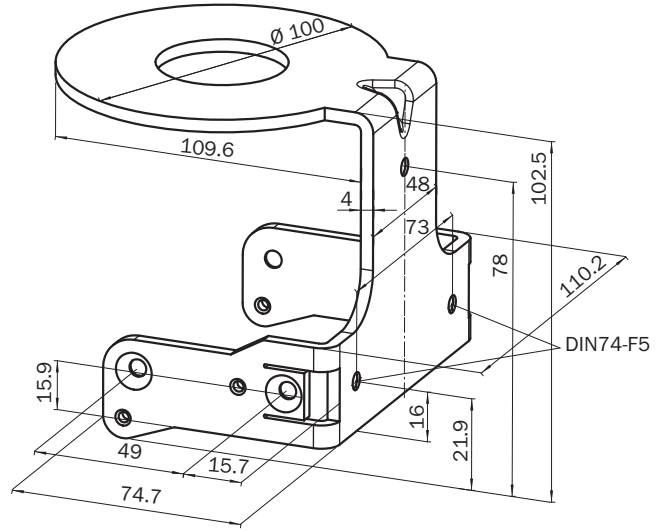
Dimensional drawings mounting systems

D

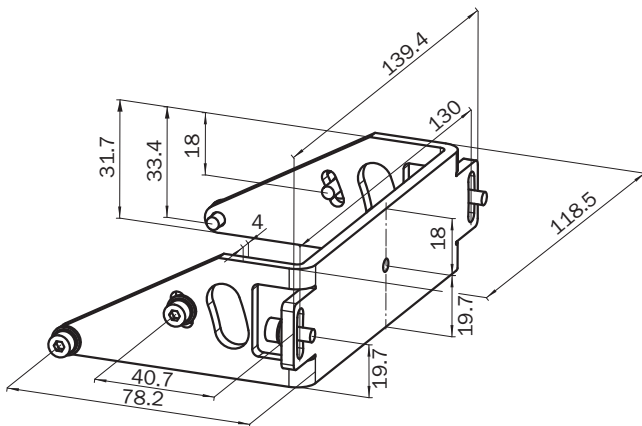
Mounting kit 1a



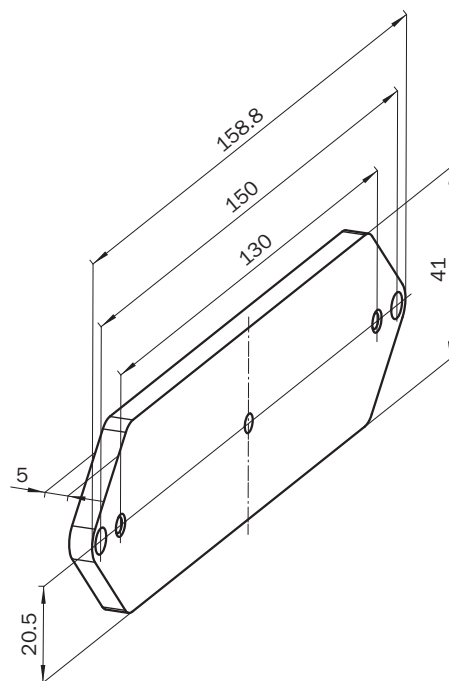
Mounting kit 1b



Mounting kit 2



Mounting kit 3



Dimensions in mm

## Technical data overview

Number of field sets	16
Switching field range	10 m
Scan angle	270°
Fixed object resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Variable object resolution	10 mm, depending on distance
Response time	40 ms

## Product description

Damaged goods, or defective machines and equipment can impede or stop processes – causing expensive downtime. The S100 laser scanner offers an efficient and economical way to prevent this. The S100 is not safety rated and was specially developed for collision avoidance in areas where people are not present or to help solve customers' supplemental monitoring applications. The S100 detects problems, moni-

tors distances and prevents potential collisions.

The ideal solution for logistics and factory automation:

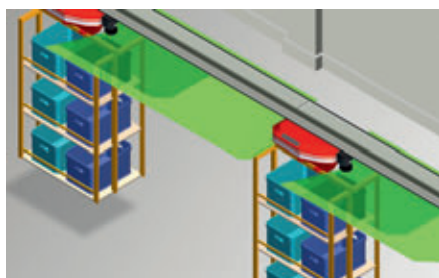
- Preventing collisions on machines, in plants and with vehicles
- Controlling doors and gates
- Monitoring transfer and stacks of material
- Checking loads and occupancy
- Approach protection

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Industrial trucks
- Automated Guided Vehicles (AGVs)
- Shelving access devices
- Shunting/towing vehicles

- Machine tools
- Doors/gates
- Assembly plant



Approach protection on Telfer/monorail systems



Monitoring the space behind a forklift truck



- Compact housing
- Tough, IP 65 design
- Stand-by input
- Selectable object resolution
- 7-segment display
- Integrated parameter memory in system plug
- CANopen interface
- Low energy consumption



Further information	Page
→ Ordering information	D-122
→ Technical specifications	D-122
→ Dimensional drawings	D-123
→ Connection diagrams	D-125
→ Accessories	D-126
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery S100

- Laser scanner
- Operating instructions and CDS – S100 (Configuration & Diagnostic Software – S100) on CD-ROM
- Adapter for cable entry from M12 to M16
- EMC-proof M16 cable gland

The system plug has to be ordered separately!

Type	Part no.
S10B-9011DA	1042267

## D

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Laser protection class	1 (21 CFR 1040.10 und 1040.11, IEC 60825-1:2001)
Enclosure rating	IP 65 (EN 60529)
Protection class	2 (DIN VDE 0160, DIN EN 50178)
Ambient operating temperature from ... to	-10 °C ... +50 °C
Type of light	Pulsed laser diode
Wave length	905 nm
Housing color	RAL 9005 (black)
Housing material	Aluminum diecast
Optics cover material	Polycarbonate
Optics cover surface finish	Outside with scratch-resistant coating
System plug	With ESD protected configuration memory
Dimensions (W x H x D)	102 mm x 152 mm x 105 mm
Weight	1.2 kg

### Functional data

Scan angle	270°
Switching field range	10 m
Reflectivity	1.8 % ... > 1000 %, Reflectors
Response time	40 ms
Fixed object resolution	30 mm, 40 mm, 50 mm, 70 mm, 150 mm, selectable
Variable object resolution	10 mm, depending on distance
Angular resolution	0.5°



## Electrical data

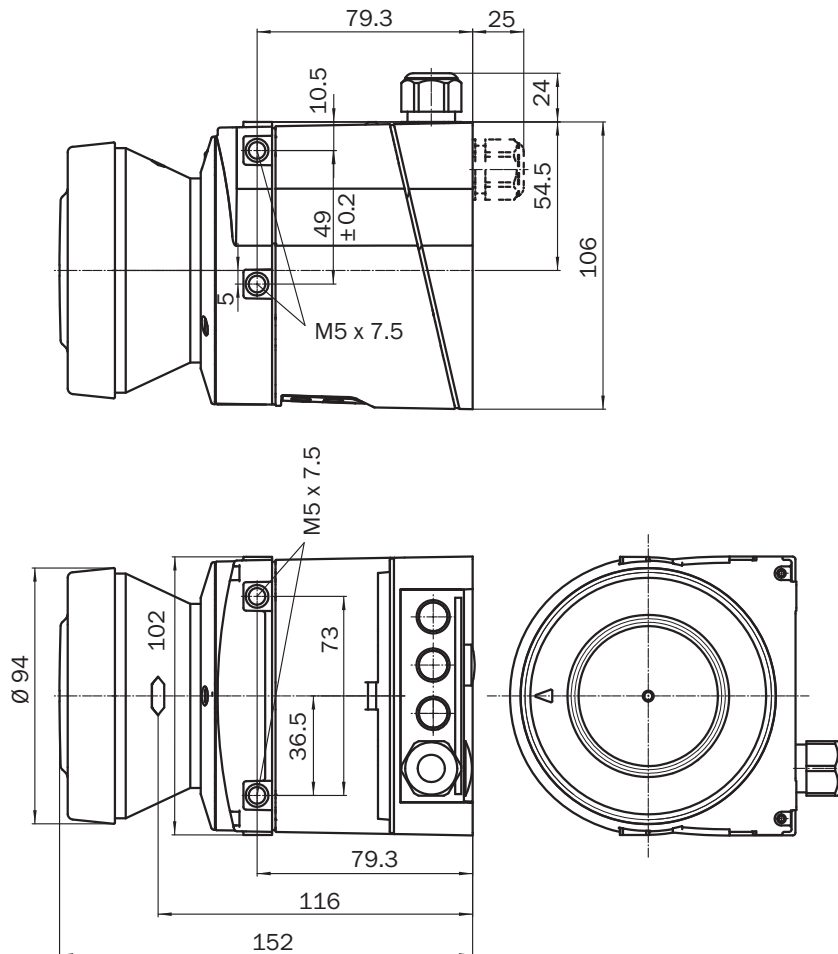
Connection type	Plug-in connection housing with screw Screw-type terminals	
Supply voltage $V_S$	24 V DC (16.8 V DC ... 30 V DC)	
Power consumption	0.33 A (24 V DC) <sup>1)</sup> 1.65 A <sup>2)</sup>	
Number of inputs	Switching inputs	4
Number of outputs	Switching outputs (Q1 and Q2)	2
	Diagnostic outputs ("Q1 inverted" and "Q2 inverted")	2
	Diagnostic output (error/contamination)	1
Fieldbus interface	CANopen®	
	Transmission rate	10 kbit/s ... 1000 kbit/s
Configuration and diagnostics interface	RS-232	
	Transmission rate	38.4 kBaud

<sup>1)</sup> Maximum, without output load

<sup>2)</sup> Including maximum output load

## Dimensional drawings

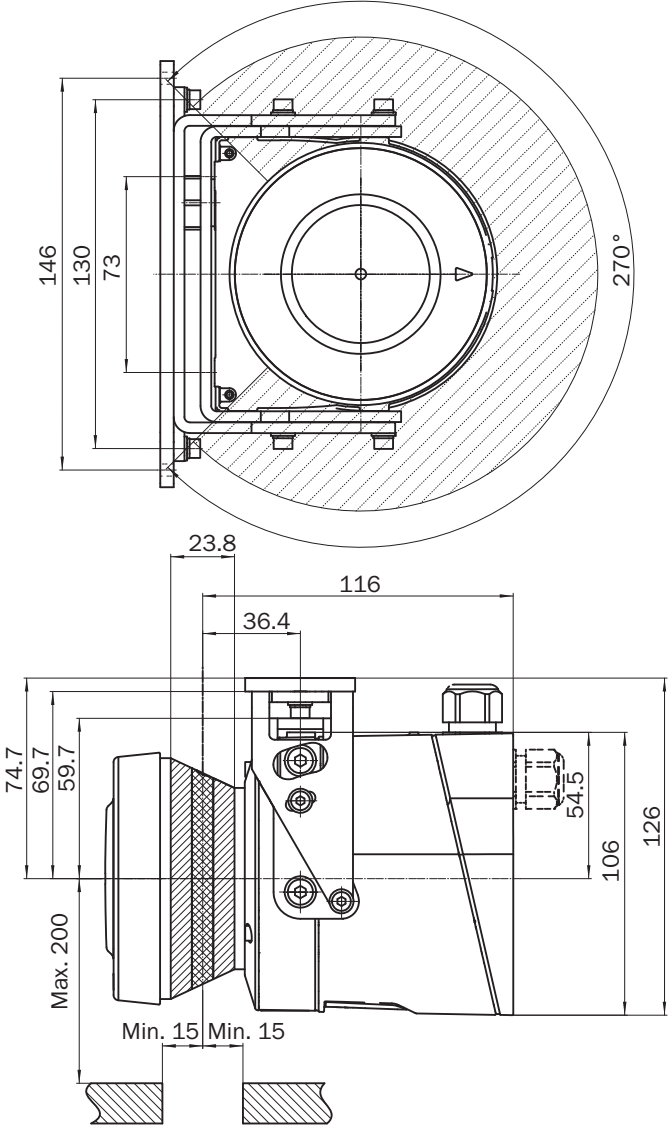
## S100



Dimensions in mm

Scan plane origin

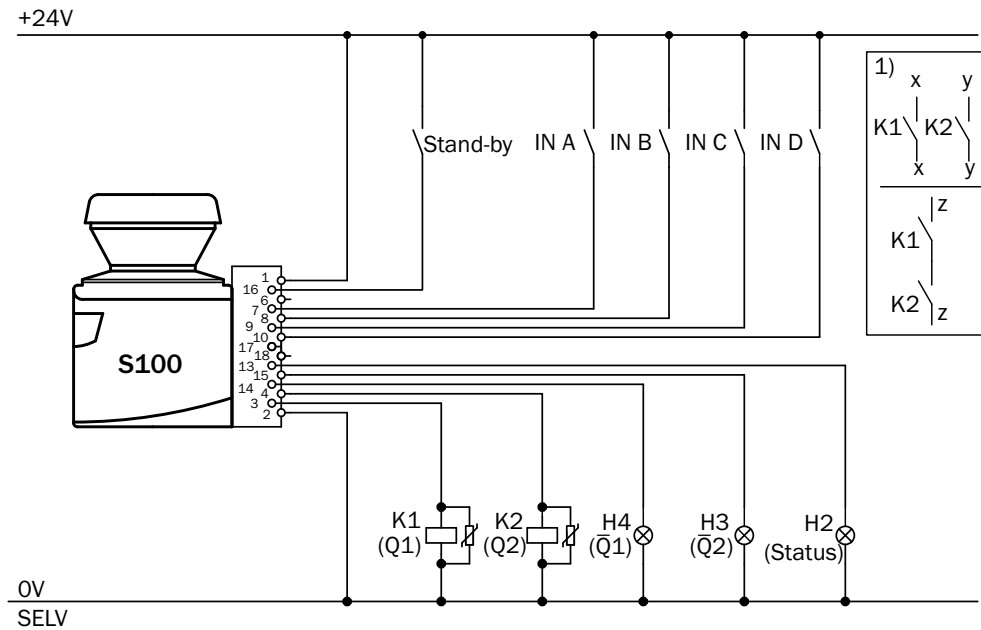
D



Dimensions in mm

## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)






S100 Professional in connection with relays/contactors, switching field switching using static inputs A, B, C and D. The LEDs H4 and H3 connected to the outputs "Q1 inverted" and "Q2



inverted" indicate the status of the related switching output. The LED H2 connected to the application diagnostic output indicates the state (error/contamination) of the S100.

## Accessories



### Mounting systems

Figure	Description	Assembly	Adjustment	Note	Type	Part no.
	Mounting brackets	For mounting at the rear on wall or machine	-	-	Mounting kit 1a	2034324
		For rear mounting on wall or machine with protection of optics cover	-	-	Mounting kit 1b	2034325
		-	Cross-wise adjustment possible	Only in conjunction with mounting kit 1a or 1b	Mounting kit 2	2039302
	Mounting plate	-	Longitudinal adjustment possible	Only in conjunction with mounting kit 2	Mounting kit 3	2039303



### System plugs

Figure	Connection type	Number of cores	Cable length	Type	Part no.
	Without cable	-	-	SX0B-A0000G	2032807
	Pre-assembled	15	5 m	SX0B-B1505G	2034264
			10 m	SX0B-B1510G	2034265


### Connection cables

Figure	Cable type (acc. to standard)	Number of cores	Type	Part no.
	-	15	Connection cable	6030795
	2 x 2 x 0.22 mm <sup>2</sup>	-	CANopen cable	6035263


### Cable glands

Figure	Usage	Size of the cable gland	Permissible cable diameter	Type	Part no.
	For cable entry from M12 to M16	M12/M16	-	Expansion M12 to M16	5320690
	For CANopen connections, EMC-proof	M16	3 mm ... 6.5 mm	Cable gland M16	5318530


**Configuration connection cable**

Figure	Note	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS-S100 (Configuration & Diagnostic Software – S100) on CD-ROM including online documentation and operating instructions in German and English	CDS-S100	2042818

**Cleaning agent**

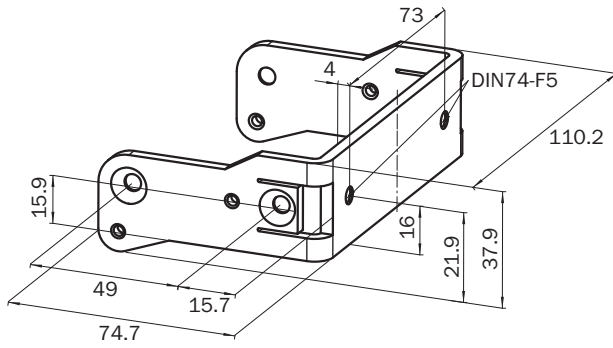
Figure	Description	Type	Part no.
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

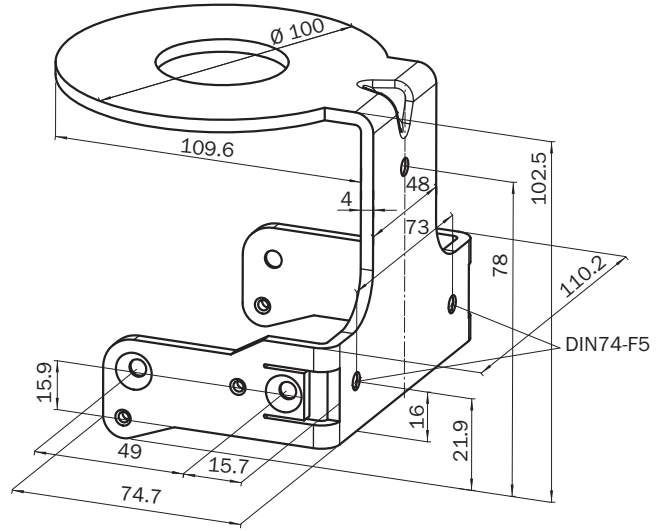
Figure	Description	Items supplied	Type	Part no.
	Spare part set optic cover	With replacement seal and screws	Spare part set optic cover	2039248
	Cloth for cleaning the front screen	–	Optical cleaning cloth	4003353

Dimensional drawings mounting systems

Mounting kit 1a



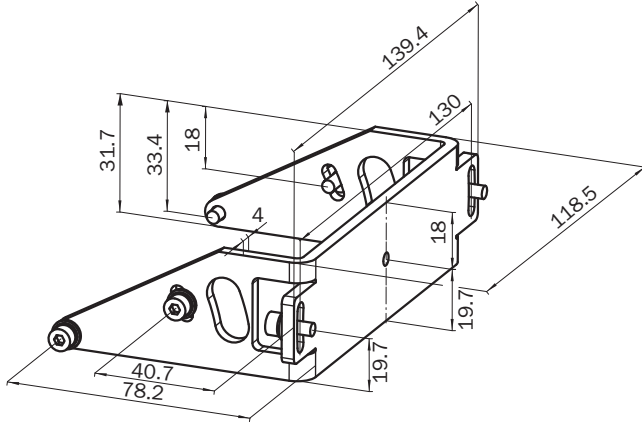
Mounting kit 1b



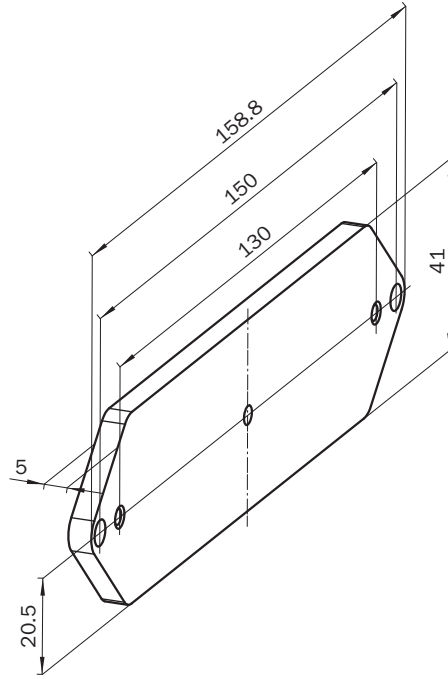
Dimensions in mm

D

Mounting kit 2



Mounting kit 3



Dimensions in mm

D

# Safety camera systems

## Principle of operation

Safety camera systems from SICK are electro-sensitive protective devices that use image processing technology for hazardous point and hazardous area protection. The sender and receiver are contained in a single housing. The reset and external device monitoring functions are already integrated. Auto-

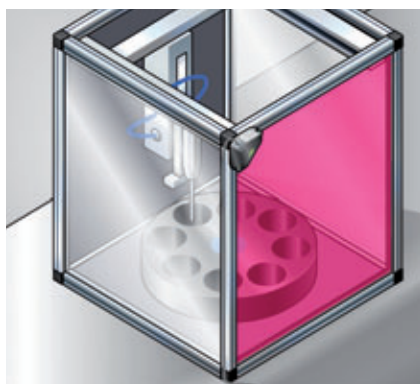
matic alignment on reflective tape makes it possible to quickly teach-in the area to be protected at the press of a button on the sensor – software configuration is therefore not required, nor is complex mounting or tedious alignment and adjustment.

## Applications

Hazardous point protection for typical rectangular access openings on, e.g., assembly and handling machines or test stations are ideal for safety camera systems. It has a compact design, three resolution options, the choice of horizontal or vertical

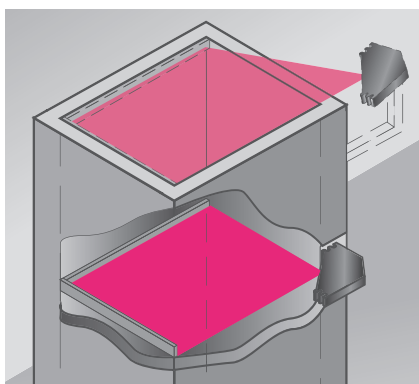
mounting, as well as the ability to combine two devices in synchronous mode. This opens up numerous cost-effective solutions on machines that in the past, could only be protected with a large amount of effort.

E



### Vertical use

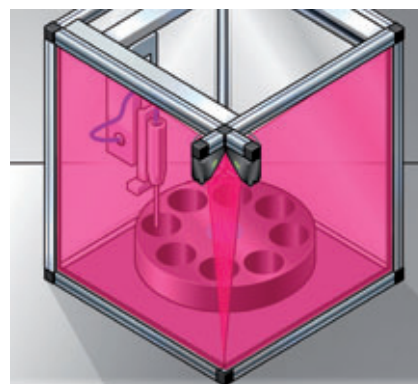
Machine openings with a size of up to 1.5 m × 1.5 m can be protected with a single device. Protective fields with an area of up to 2.25 m<sup>2</sup> are possible.



### Horizontal use

For the protection of ducts, there are two suitable mounting positions for the device:

- inside the duct, in a recess
- outside the duct, at an upward angle



### Unimpeded access

Protection of two adjacent sides: Synchronize two sensors to create a safety area that intersects at the corner of the opening. The operator has unimpeded access to the machine. In the synchronous mode, machine openings with a size of up to 3 m × 1.5 m can be protected, which corresponds to an area of 4.5 m<sup>2</sup>.

## Advantages of safety camera systems

The use of safety camera systems from SICK creates safe working conditions and provides unbeatable advantages throughout the entire product life cycle – starting from the order, through commissioning, to inventory.

### One sensor for all protective field sizes

- Easy to order
- Low effort for logistics and stockholding

### Less complex and easy to handle

- Automatic alignment
- No software necessary
- Fast commissioning


### Highly flexible

- Variable protective field sizes: Protective fields adapt to the application, like a made-to-measure suit
- Selectable resolution
- Blind zone-free protection
- Can be used horizontally and vertically
- Combination of two devices in the synchronous mode





E

Safety application	Protective field size (cm)	Resolution (mm)	Safety				Product	Page
			Type (IEC 61496)	Safety integrity level (IEC 61508)	Performance level (EN ISO 13849)	Safe device communication via EF/SDL		
	40 x 40 ... 150 x 150	20 / 24 / 30	3	SIL2	PL d	-	V300 Work Station Extended	E-2
			2	SIL1	PL c	-	V200 Work Station Extended	E-8



E

- Simplest integration
- Intuitive one-button setup
- One system fits all protective field sizes
- Flexible protective field geometries
- Automatic alignment
- Restart/reset, EDM integrated



## Technical data overview

Maximum protective field range	2.12 m <sup>1)</sup>
Minimum protective field size	40 cm x 40 cm <sup>1)</sup>
Maximum protective field size	150 cm x 150 cm <sup>1)</sup>
Resolution	20 mm, 24 mm, 30 mm <sup>1)</sup>
Response time	20 ms
Type	Type 3 (IEC 61496)
Safety integrity level	SIL 2 (IEC 61508)
Performance level	PL d (EN ISO 13849)

<sup>1)</sup> Depending on resolution set

## Product description

The V300 Work Station Extended is a sensor based on innovative camera technology developed for hazardous point protection on rectangular point-of-operation openings. With just one component, the V300 can be mounted in a protected corner of the safety area, saving space.

The “one sensor fits all” concept reduces the number of sensor types – one sensor, combined with the suitable resolution set, covers the most diverse protective field.

When combining two V300 Work Station Extended units, the protective field size can be enhanced up to 300 cm x 150 cm.

Costs are reduced due to:

- No variants: simplified inventory
- One component: quick installation and commissioning, minimum use of resources
- Minimum power consumption

## In-system added value

Combined with SICK safe control solutions

→ For more combinations, see annex

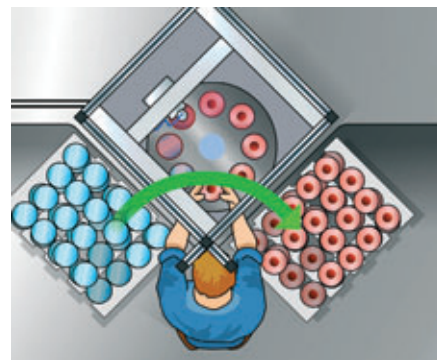
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Hazardous point protection in semi-automatic work processes
- Protection of test, assembly and inspection stations
- Service openings with sporadic access
- Presence detection



Hazardous point protection on a semi-automatic assembly machine



Hazardous point protection on a semi-automatic assembly machine. The combination of two camera systems can increase ergonomics.

Further information	Page
→ Dimensional drawings	E-4
→ Connection diagrams	E-5
→ Accessories	E-6
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Delivery of the V300 Work Station Extended:

- Camera
- Teach-in pin
- Label "Important Information"
- Operating instructions on CD-ROM
- Quick start (instructions for quick commissioning), multilingual

A resolution set has to be ordered separately!

Type	Part no.
V30W-0101000	1041542

→ For ordering information about resolution sets and accessories, see page E-6

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Protection class	III (EN 50178)
Enclosure rating	IP 54 (IEC 60529)
Safety related parameters (depending on type)	
Type	Type 3 (IEC 61496)
Safety integrity level	SIL 2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$3.2 \times 10^{-9}$ (EN ISO 13849)
$T_M$ (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	0 °C ... +50 °C
Wave length illumination	850 nm
Dimensions (W x H x D)	90 mm x 50 mm x 90 mm
Maximum protective field range	2.12 m <sup>1)</sup>
Minimum protective field size	40 cm x 40 cm <sup>1)</sup>
Maximum protective field size	150 cm x 150 cm <sup>1)</sup>
Aspect ratio protective field	1:1 to 2:1
Resolution	20 mm, 24 mm, 30 mm <sup>1)</sup>
Response time	20 ms

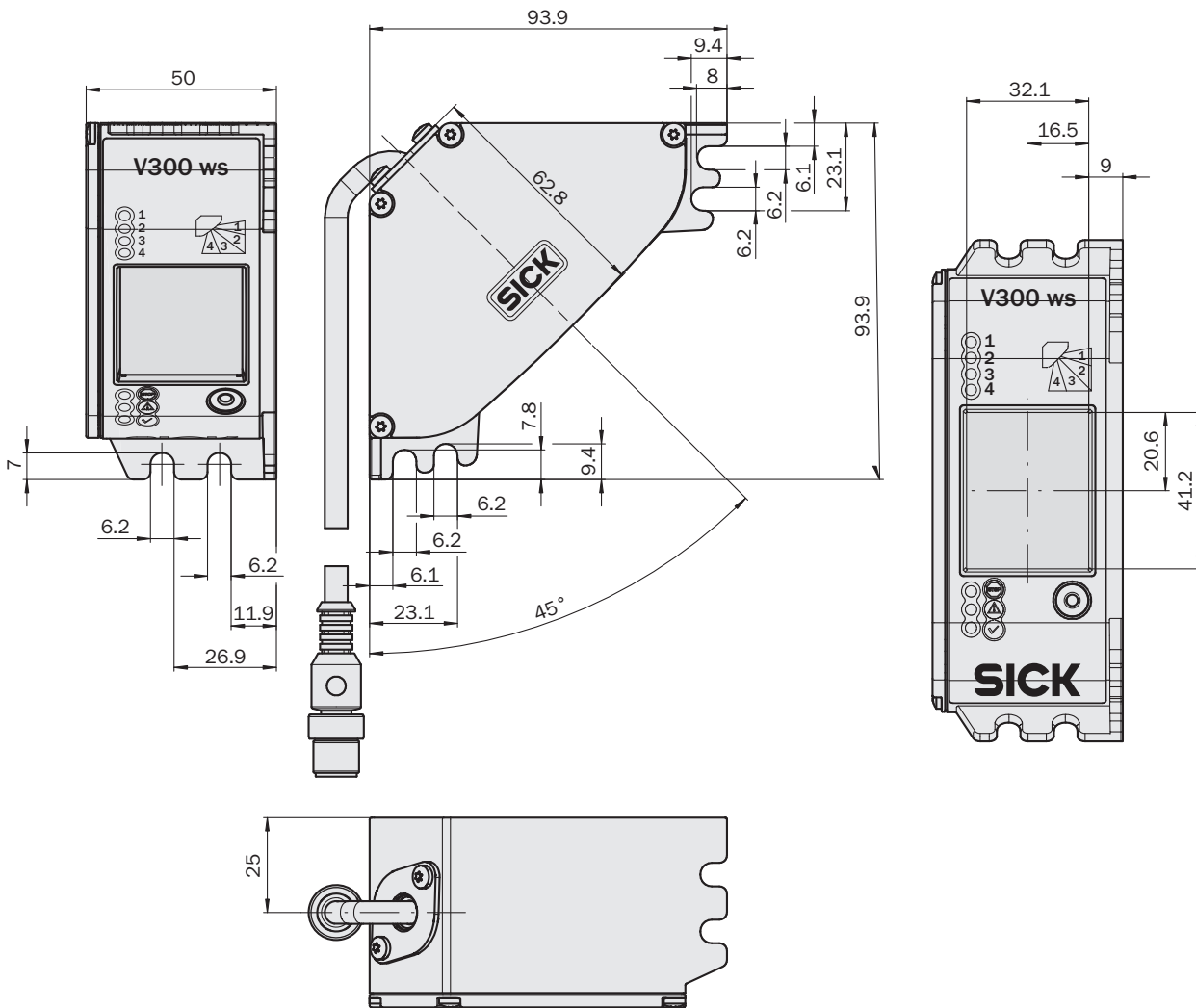
<sup>1)</sup> Depending on resolution set

Electrical data

Connection type (depending on type)	
System connection	M12 x 8
Supply voltage	24 V DC
Power consumption (depending on type)	
Including maximum output load	Max. 690 mA
At 24 V without output load	165 mA
Number of inputs (depending on type)	
External device monitoring	1
Restart interlock	1
Teach/sync	1
Switching outputs	2
Switching current	6 mA ... 250 mA

E

Dimensional drawings

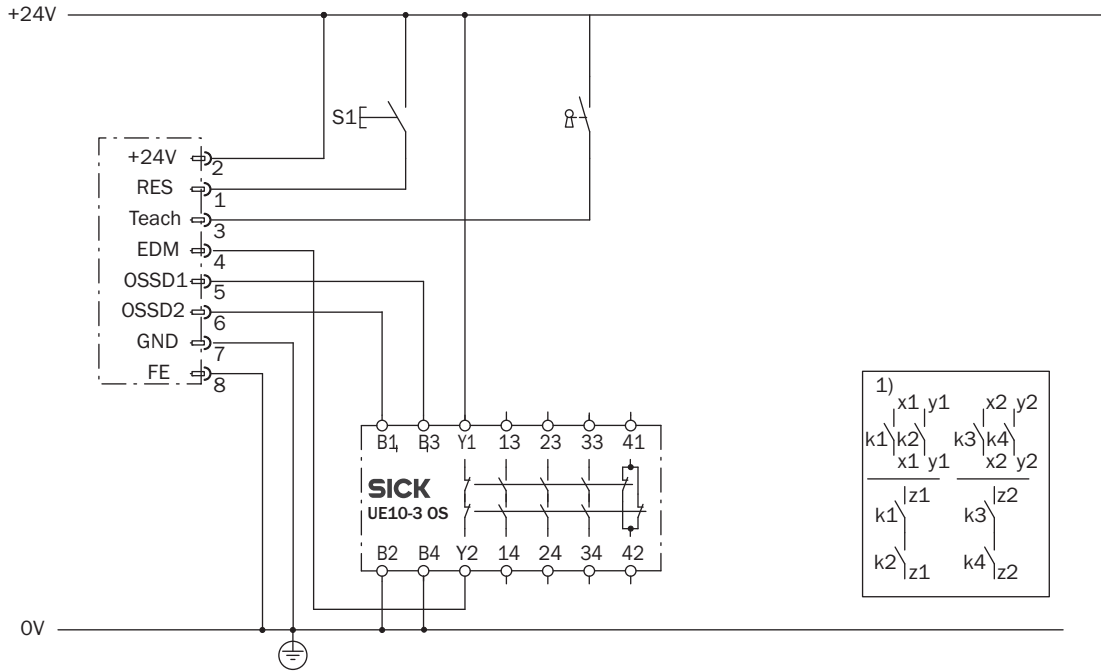


Dimensions in mm

## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)

### V300 Work Station Extended on UE10-30S safety relay



**Task**

The V300 Work Station Extended safety camera system can be integrated into a relay controller/contactor controller with the aid of the UE10-30S safety relay. Operation is with external device monitoring (EDM) and internal restart interlock.

**Function**

If the light path is clear and there are no errors in the inactive state of the UE10-30S, the status LED on the V300 Work Station Extended flashes (reset required). The system is ready for switch-on and waits for an input signal/switch-on signal. The system is

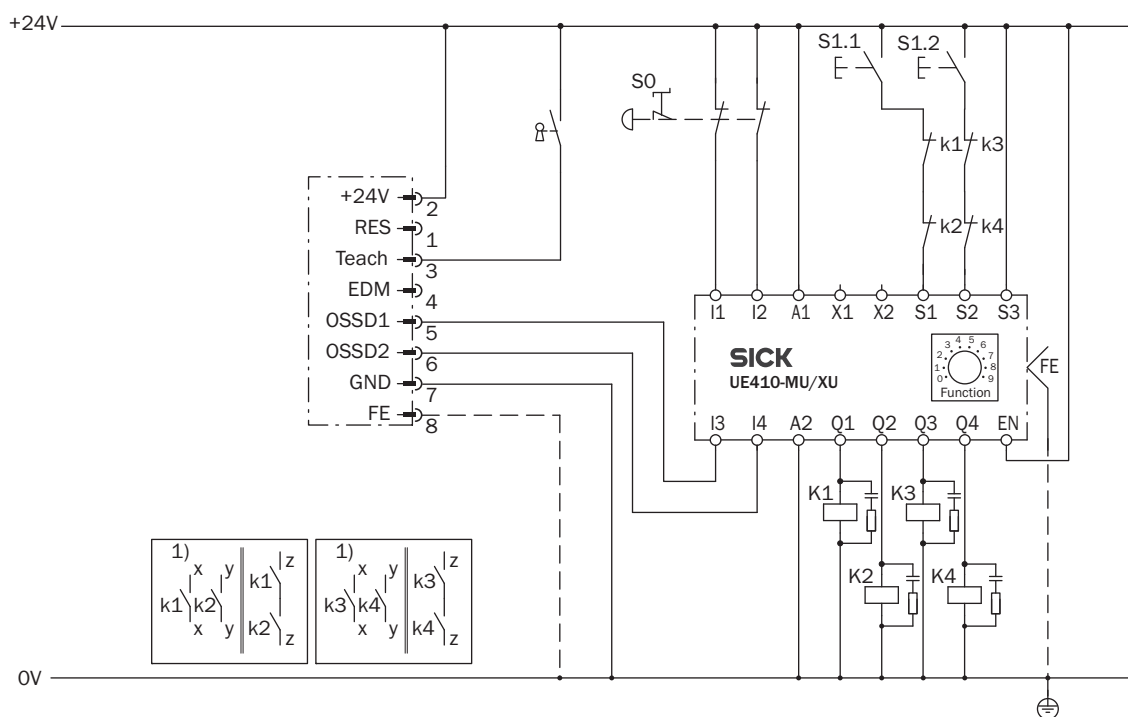
enabled by pressing and releasing the S1 button. The OSSD1 and OSSD2 outputs carry power. The UE10-30S is switched on. On interruption of the light path, the UE10-30S is de-energized by the OSSD1 and OSSD2 outputs.

**Possible faults**

Cross-circuits and short-circuits on the OSSD1 and OSSD2 outputs are detected and will result in "lock-out." Malfunctions on the UE10-30S are detected. The shutdown function is retained. If the S1 button is tampered with (e.g., by jamming), the system will not re-enable the output circuits.

E

V300 Work Station Extended on Flexi Classic



E

**Task**

The V300 Work Station Extended safety camera system can be integrated into a relay controller/contactor controller with the aid of the modular Flexi Classic (UE410-MU with expansion UE410-XU) safety controller. Operation is with external device monitoring and internal restart interlock on the V300 Work Station Extended as well as restart interlock for the emergency stop.

**Function**

When the light path on the V300 Work Station Extended is clear and the input conditions on the Flexi Classic are valid, the system is ready for switch-on and waits for an input signal/switch-on

signal. The system's corresponding logic path is enabled by pressing and releasing the related S1 button. The related output on the Flexi Classic carries power. If the input conditions are no longer met, the related outputs on the Flexi Classic shut down.

**Possible faults**

Cross-circuits and short-circuits on the connection cables for the V300 Work Station Extended are detected and result in "lock-out." Malfunctions on the K1 to K4 contactors are detected. The shutdown function is retained. If the S1.x button is tampered with (e.g., by jamming), the system will not re-enable the output circuits.

Accessories


**Resolution sets**

Figure	Description	Maximum protective field range	Minimum protective field size	Maximum protective field size	Type	Part no.
 <p>Presentation similar</p>	Reflective tape 2 x 1.0 m with test rod, 20 mm diameter	Max. 1.41 m	40 cm x 40 cm	100 cm x 100 cm	Resolution set 20 mm	2051336
	Reflective tape 2 x 1.2 m with test rod, 24 mm diameter	Max. 1.7 m	40 cm x 40 cm	120 cm x 120 cm	Resolution set 24 mm	2051338
	Reflective tape 2 x 1.5 m with test rod, 30 mm diameter	Max. 2.12 m	60 cm x 60 cm	150 m x 150 cm	Resolution set 30 mm	2051339


**Mounting systems**

Figure	Mounting	Type	Part no.
	For mounting the sensor on profile frame	Mounting kit	2045375


**Connection cables**

Figure	Connection type	Cable length	Type	Part no.
	M12 x 7 + FE	2.5 m	DOL-127SG2M5E25KM0	6020537
		5 m	DOL-127SG05ME25KM0	6020354
		7.5 m	DOL-127SG7M5E25KM0	6020353

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789


**Configuration tools**

Figure	Type	Part no.
	Teach-in pin	4052939

**Device protection**



Figure	Description	Type	Part no.
	20 mm diameter	Test rod	2022600
	24 mm diameter	Test rod	2045592
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

**Reflective tapes <sup>1)</sup>**

Figure	Description	Dimensions (L x W x H)	Items supplied	Part no.
	Robust version	1 m x 3.6 cm x 0.08 cm	2 pieces	2046005
		1.2 m x 3.6 cm x 0.08 cm	2 pieces	2051581
		1.5 m x 4.8 cm x 0.08 cm	2 pieces	2051582

<sup>1)</sup> Additional types available upon request

**Cleaning agent and solvents**

Figure	Description	Type	Part no.
	Solvent for adhesive, spray bottle, suitable for removing the reflective tape	Solvent for adhesive	5602135
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

Figure	Description	Type	Part no.
	Cloth for cleaning the front screen	Optical cleaning cloth	4003353



E

- Simplest integration
- Intuitive one-button setup
- One system fits all protective field sizes
- Flexible protective field geometries
- Automatic alignment
- Restart/reset, EDM integrated



## Technical data overview

Maximum protective field range	2.12 m <sup>1)</sup>
Minimum protective field size	40 cm x 40 cm <sup>1)</sup>
Maximum protective field size	150 cm x 150 cm <sup>1)</sup>
Resolution	20 mm, 24 mm, 30 mm <sup>1)</sup>
Response time	20 ms
Type	Type 2 (IEC 61496)
Safety integrity level	SIL1 (IEC 61508)
Performance level	PL c (EN ISO 13849)

<sup>1)</sup> Depending on resolution set

## Product description

The V200 Work Station Extended is a sensor based on innovative camera technology and typically used for hazardous point protection on rectangular point-of-operation openings. With just one component, the V200 can be mounted in a protected corner of the safety area and saving space. The “one sensor fits all” concept reduces the number of sensor types – one sensor, combined with the suitable resolution set, covers the most diverse protective field.

When combining two V200 Work Station Extended units, the protective field size can be enhanced up to 300 cm x 150 cm.

Costs are reduced due to:

- No variants: simplified inventory
- One component: quick installation and commissioning, minimum use of resources
- Minimum power consumption

## In-system added value

Combined with SICK safe control solutions

→ For more combinations, see annex

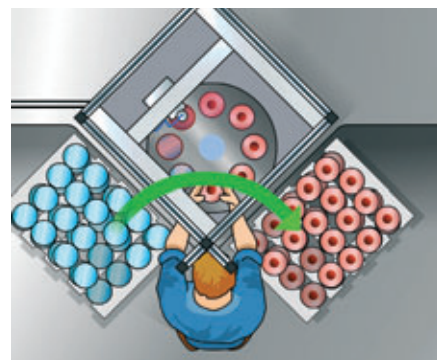
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Hazardous point protection in semi-automatic work processes
- Protection of test, assembly and inspection stations
- Service openings with sporadic access
- Presence detection



Hazardous point protection on a semi-automatic assembly machine



Hazardous point protection on a semi-automatic assembly machine. The combination of two camera systems can increase ergonomics.

Further information	Page
→ Dimensional drawings	E-10
→ Connection diagrams	E-11
→ Accessories	E-12
→ Systematic safety	A-0
→ Services	B-0



## Ordering information

Delivery of the V200 Work Station Extended:

- Camera
- Teach-in pin
- Label "Important Information"
- Operating instructions on CD-ROM
- Quick start (instructions for quick commissioning), multilingual

A resolution set has to be ordered separately!

Type	Part no.
V20W-0101000	1042027

→ For ordering information about resolution sets and accessories, see page E-12

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Protection class	III (EN 50178)
Enclosure rating	IP 54 (IEC 60529)
Safety related parameters (depending on type)	
Type	Type 2 (IEC 61496)
Safety integrity level	SIL1 (IEC 61508) SILCL1 (EN 62061)
Category	Category 2 (EN ISO 13849)
Test rate (internal test)	50 /s (EN ISO 13849)
Maximum demand rate	30 /min (EN ISO 13849) <sup>1)</sup>
Performance level	PL c (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$3.2 \times 10^{-9}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	0 °C ... +50 °C
Wave length illumination	850 nm
Dimensions (W x H x D)	90 mm x 50 mm x 90 mm
Maximum protective field range	2.12 m <sup>2)</sup>
Minimum protective field size	40 cm x 40 cm <sup>2)</sup>
Maximum protective field size	150 cm x 150 cm <sup>2)</sup>
Aspect ratio protective field	1:1 to 2:1
Resolution	20 mm, 24 mm, 30 mm <sup>2)</sup>
Response time	20 ms

<sup>1)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

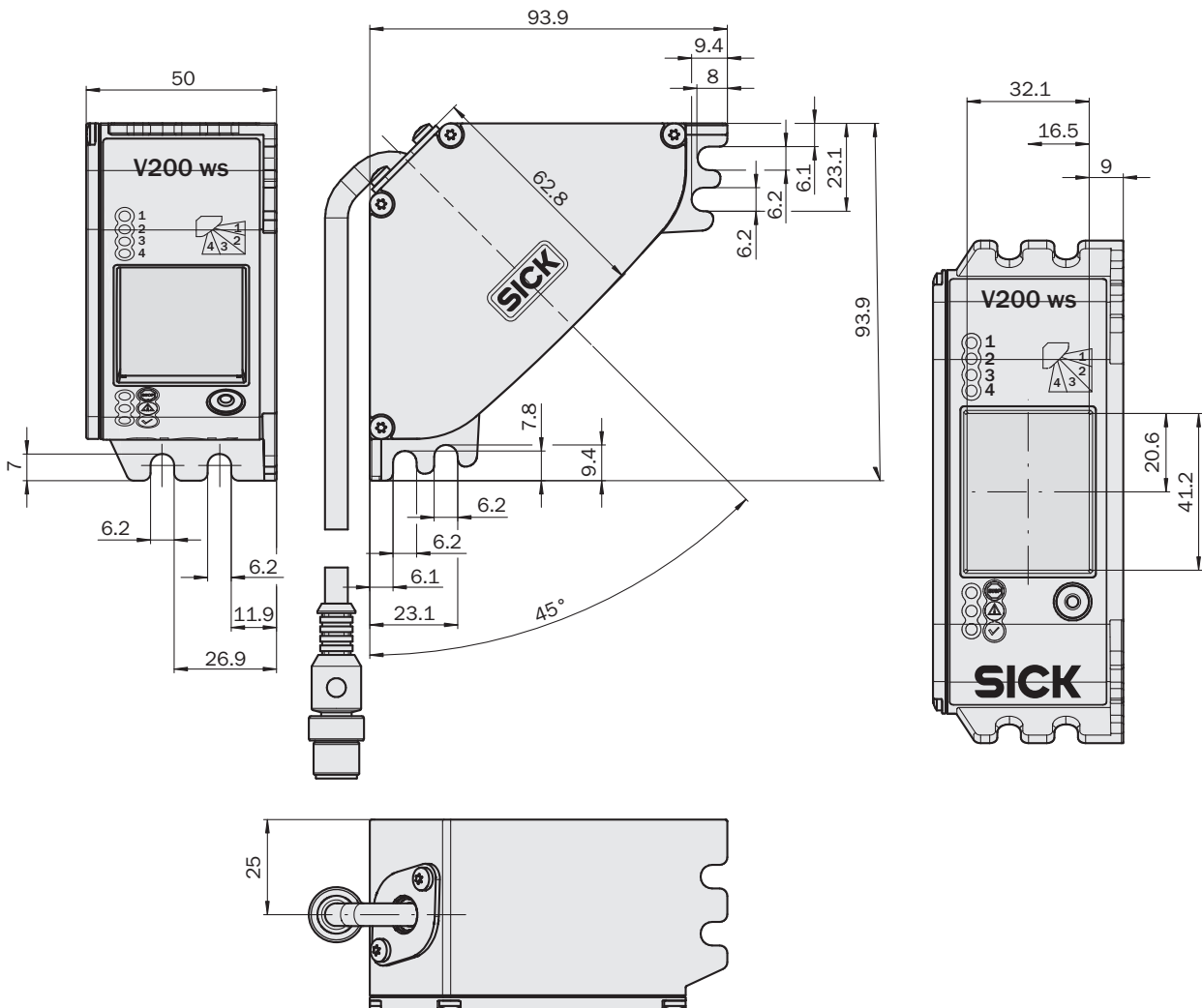
<sup>2)</sup> Depending on resolution set

Electrical data

Connection type (depending on type)	
System connection	M12 x 8
Supply voltage	24 V DC
Power consumption (depending on type)	
Including maximum output load	Max. 690 mA
At 24 V without output load	165 mA
Number of inputs (depending on type)	
External device monitoring	1
Restart interlock	1
Teach/sync	1
Switching outputs	2
Switching current	6 mA ... 250 mA



Dimensional drawings

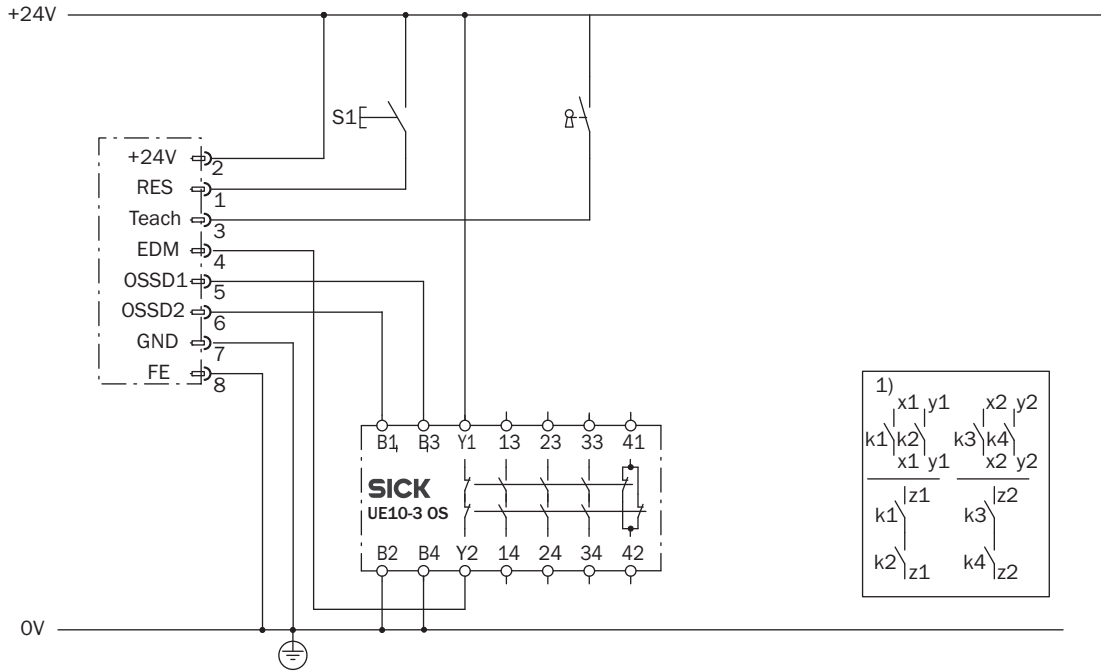


Dimensions in mm

## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)

### V200 Work Station Extended on UE10-30S safety relay



E

#### Task

The V200 Work Station Extended safety camera system can be integrated into a relay controller/contactor controller with the aid of the UE10-30S safety relay. Operation is with external device monitoring (EDM) and internal restart interlock.

#### Function

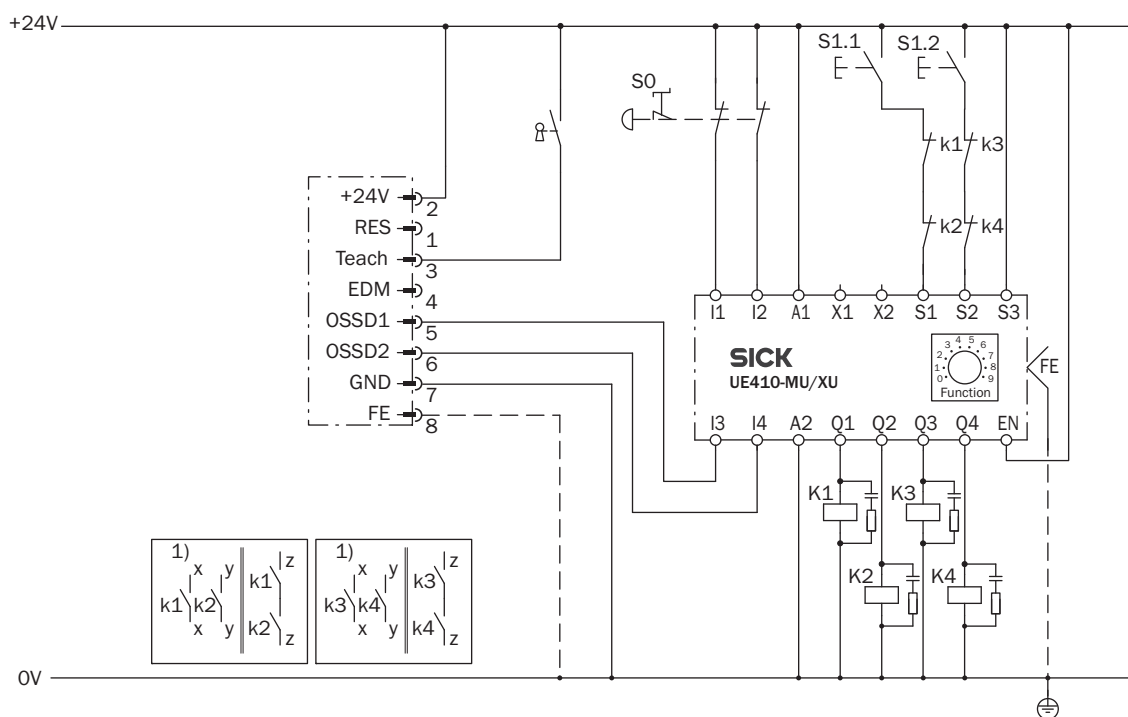
If the light path is clear and there are no errors in the inactive state of the UE10-30S, the status LED on the V200 Work Station Extended flashes (reset required). The system is ready for switch-on and waits for an input signal/switch-on signal. The system is

enabled by pressing and releasing the S1 button. The OSSD1 and OSSD2 outputs carry power. The UE10-30S is switched on. On interruption of the light path, the UE10-30S is de-energized by the OSSD1 and OSSD2 outputs.

#### Possible faults

Cross-circuits and short-circuits on the OSSD1 and OSSD2 outputs are detected and will result in “lock-out.” Malfunctions on the UE10-30S are detected. The shutdown function is retained. If the S1 button is tampered with (e.g., by jamming), the system will not re-enable the output circuits.

V200 Work Station Extended on Flexi Classic



E

**Task**

The V200 Work Station Extended safety camera system can be integrated into a relay controller/contactor controller with the aid of the modular Flexi Classic (UE410-MU with expansion UE410-XU) safety controller. Operation is with external device monitoring and internal restart interlock on the V200 Work Station Extended as well as restart interlock for the emergency stop.

**Function**

When the light path on the V200 Work Station Extended is clear and the input conditions on the Flexi Classic are valid, the system is ready for switch-on and waits for an input signal/switch-


on signal. The system's corresponding logic path is enabled by pressing and releasing the related S1 button. The related output on the Flexi Classic carries power. If the input conditions are no longer met, the related outputs on the Flexi Classic shut down.

**Possible faults**

Cross-circuits and short-circuits on the connection cables for the V200 Work Station Extended are detected and result in "lock-out". Malfunctions on the K1 to K4 contactors are detected. The shutdown function is retained. If the S1.x button is tampered with (e.g., by jamming), the system will not re-enable the output circuits.

Accessories


**Resolution sets**

Figure	Description	Maximum protective field range	Minimum protective field size	Maximum protective field size	Type	Part no.
 <p>Presentation similar</p>	Reflective tape 2 x 1.0 m with test rod, 20 mm diameter	Max. 1.41 m	40 cm x 40 cm	100 cm x 100 cm	Resolution set 20 mm	2051336
	Reflective tape 2 x 1.2 m with test rod, 24 mm diameter	Max. 1.7 m	40 cm x 40 cm	120 cm x 120 cm	Resolution set 24 mm	2051338
	Reflective tape 2 x 1.5 m with test rod, 30 mm diameter	Max. 2.12 m	60 cm x 60 cm	150 m x 150 cm	Resolution set 30 mm	2051339


**Mounting systems**

Figure	Mounting	Type	Part no.
	For mounting the sensor on profile frame	Mounting kit	2045375


**Connection cables**

Figure	Connection type	Cable length	Type	Part no.
	M12 x 7 + FE	2.5 m	DOL-127SG2M5E25KM0	6020537
		5 m	DOL-127SG05ME25KM0	6020354
		7.5 m	DOL-127SG7M5E25KM0	6020353



**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789


**Configuration tools**

Figure	Type	Part no.
	Teach-in pin	4052939

**Device protection**



Figure	Description	Type	Part no.
	20 mm diameter	Test rod	2022600
	24 mm diameter	Test rod	2045592
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

**Reflective tapes <sup>1)</sup>**

Figure	Description	Dimensions (L x W x H)	Items supplied	Part no.
	Robust version	1 m x 3.6 cm x 0.08 cm	2 pieces	2046005
		1.2 m x 3.6 cm x 0.08 cm	2 pieces	2051581
		1.5 m x 4.8 cm x 0.08 cm	2 pieces	2051582

<sup>1)</sup> Additional types available upon request

**Cleaning agent and solvents**

Figure	Description	Type	Part no.
	Solvent for adhesive, spray bottle, suitable for removing the reflective tape	Solvent for adhesive	5602135
	Plastic cleaner and care product, anti-static	Plastic cleaner	5600006

**Other**

Figure	Description	Type	Part no.
	Cloth for cleaning the front screen	Optical cleaning cloth	4003353

# Safety light curtains

## Principle of operation of safety light curtains

Safety light curtains are used for finger protection, hand protection and access protection. They comprise a sender unit and a receiver unit and are electro-sensitive. Depending on the type, various machine functions are integrated or can be selected

using safe control solutions: Restart interlock, external device monitoring, fixed/floating blanking, PSDI function, bypass function, operating mode selection, etc.

## Applications for safety light curtains

Presses, automatic placement machines, robot insertion stations, transfer lines, palletizer systems, textile and wood processing machines, etc.

### Tell us your application!

We will show you the most cost-effective solution.

## Advantages of the SICK safety light curtains

### Only invest in what you actually need!

Effective protection for man and machine – irrespective of the safety task you want to address, SICK can provide a comprehensive solution with a wide range of safety light curtains.

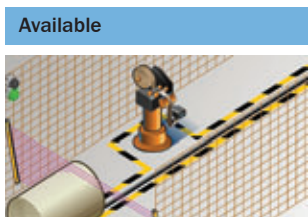
- Cost-saving, complete systems with integrated functions for a wide range of requirements
- Rapid commissioning

- Individual adaptation using CDS user software or customer-specific pre-settings from the factory
- Can be used with large temperature fluctuations as well as in wet areas due to IP69K Housing
- Reduced engineering and inventory costs due to universal interface for various automation environments
- Integrated PSDI mode with defined PSDI window provides up to 30% higher productivity

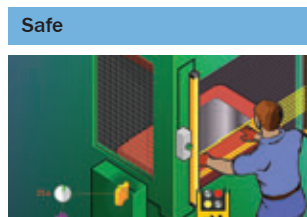
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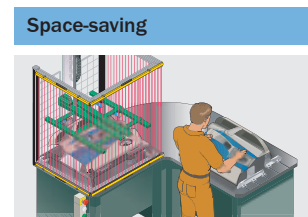
**Cost-effective**  
Access protection:  
A safety light curtain without additional sensors and mechanics



**Available**  
Access protection with differentiation between man and material using “blinking”

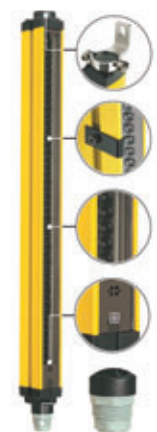


**Safe**  
Classic finger/hand protection:  
Defined PSDI window hinders unintentional cycle start caused by reaching over or reaching under



**Space-saving**  
Miniaturization enables U-shaped hazardous point protection in small openings and spaces

## Mounting and operation made easy



Comprehensive range of mounting solutions and accessories provides a wide range of installation options

Heavy-duty additional front screen for use with welding sparks

ATEX variants enable applications in zones 2 and 22 (ATEX II cat. 3G/3D).



7-segment display for device status with display that can be rotated by 180°

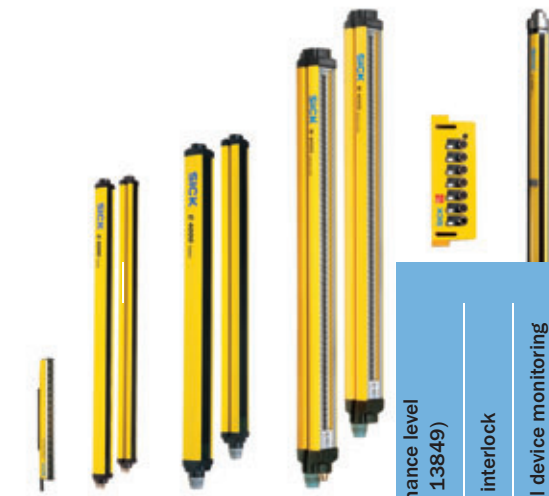
All peripheral technologies can be incorporated using a universal interface: from the relay through safe control to the bus.

## Services for productive safety

With services tailored specifically to your needs, SICK offers all embracing support for the safety of your machine or system.

Address productivity and cost-effectiveness from the start: From selection and planning, through commissioning and inspection, to maintenance and modernization.

→ For information about the services please refer to chapter B

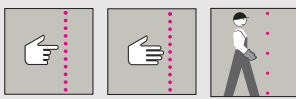


Safety application (IEC 61496)	Type	Resolution (mm)	Functions										Product	Page	
			Performance level (EN ISO 13849)	Restart interlock	External device monitoring	Muting	Beam coding	Safe device communication via EFI/SDL	Operating mode selection <sup>1)</sup>	Reduced resolution	PSDI mode	Blanking/goods detection			Ambient operating temperature (°C)
	Type 4	14/20/30/40	PL e	✓	✓	✓ <sup>3)</sup>	✓	✓	✓	✓	✓ <sup>1)3)</sup>	✓	0 ... +55	C4000 Advanced	F-2
		14/20/30/40	PL e	✓	✓	✓ <sup>3)</sup>	✓	✓	✓	-	✓ <sup>1)3)</sup>	-	0 ... +55	C4000 Standard	F-29
		14/30	PL e	✓	✓	✓ <sup>3)</sup>	✓	✓	-	-	✓ <sup>3)</sup>	-	-10 ... +55	C4000 ATEX II 3G/3D	F-65
		14/30	PL e	✓	✓	✓ <sup>2)</sup>	✓	✓	-	-	✓ <sup>3)</sup>	-	-10 ... +55	M4000 Advanced Curtain	F-68
		14/30	PL e	-	-	✓ <sup>3)</sup>	✓	-	-	-	✓ <sup>3)</sup>	✓	0 ... +55	C4000 Select	F-87
		14/24/34	PL e	✓	✓	✓ <sup>3)</sup>	✓	-	-	-	✓ <sup>3)</sup>	-	-20 ... +55	miniTwin4	F-105
		14/30	PL e	✓	✓	✓ <sup>3)</sup>	-	-	-	-	✓ <sup>3)</sup>	-	0 ... +55	C4000 Micro	F-117
			PL e	✓	✓	✓ <sup>3)</sup>	-	-	-	-	✓ <sup>3)</sup>	-	0 ... +55	C4000 Micro in IP69K Housing	F-129
			PL e	✓	✓	✓ <sup>3)</sup>	-	-	-	-	✓ <sup>3)</sup>	-	-30 ... +55 <sup>4)</sup>	C4000 Micro Cold Store	F-136
			PL e	✓	✓	✓ <sup>3)</sup>	-	-	-	-	✓ <sup>3)</sup>	-	0 ... +55	C4000 Basic Plus	F-142
PL e	-		✓	✓ <sup>3)</sup>	-	-	-	-	✓ <sup>3)</sup>	-	0 ... +55	C4000 Basic	F-155		
PL e	-	-	✓ <sup>3)</sup>	-	-	-	-	✓ <sup>3)</sup>	-	0 ... +55	C4000 Eco	F-168			
	Type 4	20	PL e	✓	✓	-	-	✓	✓	-	-	✓ <sup>3)</sup>	0 ... +55	C4000 Entry/Exit	F-181
		30/40	PL e	✓	✓	-	✓	✓	✓	-	-	✓ <sup>3)</sup>	0 ... +55	C4000 Palletizer	F-192
	Type 2	20	PL e	✓	✓	-	✓	✓	✓	-	✓ <sup>3)</sup>	0 ... +55	C4000 Fusion	F-205	
		14/24/34	PL d <sup>5)</sup>	✓	✓	✓ <sup>3)</sup>	✓	-	-	-	-	-	-20 ... +55	miniTwin2	F-224
		20/30/40	PL d <sup>5)</sup>	-	✓	✓ <sup>3)</sup>	✓	-	-	-	-	-	0 ... +55	C2000 Standard	F-236
		30	PL d <sup>5)</sup>	-	✓	✓ <sup>3)</sup>	✓	-	-	-	-	-	0 ... +55	C2000 Standard in IP69K Housing	F-253
			PL d <sup>5)</sup>	-	-	✓ <sup>3)</sup>	-	-	-	-	-	-	0 ... +55	C2000 Eco	F-261
		20/30/40	PL d <sup>5)</sup>	✓	✓	✓ <sup>3)</sup>	✓	-	-	-	-	-	0 ... +55	C2000 RES/EDM	F-272
			PL d <sup>5)</sup>	-	✓	✓ <sup>3)</sup>	✓	-	-	-	-	-	0 ... +55	C2000 Cascadable	F-285

<sup>1)</sup> With UE402    <sup>3)</sup> With Flexi Classic / Flexi Soft    <sup>5)</sup> The performance level does not contain any specific requirements on aspects such the  
<sup>2)</sup> With UE403    <sup>4)</sup> Depending on use of the integrated heating as optical characteristics. For more detailed information on this topic, see page A-10.

→ Suitable mirror and device columns can be found beginning on page I-0





F

- External device monitoring (EDM)
- Restart interlock (RES)
- Beam coding
- Teach-in blanking
- Floating blanking
- Fixed blanking
- Reduced resolution
- Up to 3 systems can be cascaded
- Alignment and diagnostics via 7-segment display
- Configuration and diagnostics via PC



Further information	Page
→ Technical specifications	F-10
→ Dimensional drawings	F-14
→ Connection diagrams	F-19
→ Accessories	F-20
→ Systematic safety	A-0
→ Services	B-0

## Technical data overview

Protective field height (depending on type)	150 mm ... 1800 mm
Scanning range (depending on type)	0 m ... 8 m / 0 m ... 19 m
Resolution (depending on type)	14 mm ... 40 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Advanced safety light curtain is used wherever hazardous points and hazardous areas require reliable and cost-effective protection:

- Blanking functions allow defined objects to be present in the protective field, e.g., cables, benches.
- Quick teach-in on-site reduces setup times
- Adjustable tolerances increase availability

- Emergency stop, bypass or reset directly at the extension connection
- Application diagnostic output for status information
- Configure quickly and easily using Clone Plug
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

Combined with SICK safe control solutions

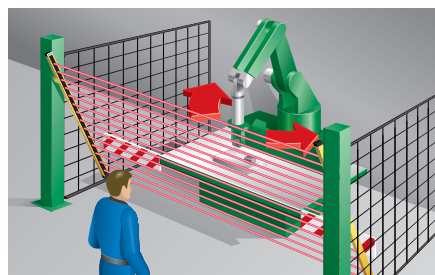
Combination with	Restart interlock	External device monitoring	Bypass	PSDI/PSDI window	Teach-in	Operating mode selection	Further information
UE402	-	-	✓	✓	✓	✓	F-13
Flexi Classic	✓	✓	✓	-	-	-	O-2
Flexi Soft	✓	✓	✓	✓	✓	✓	O-25
UE48-20S	✓	✓	-	-	-	-	N-46
UE48-30S	✓	✓	-	-	-	-	N-52
UE10-30S	Contact expansion module						N-63

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Material handling
- Plastic
- Transforming machine tools
- Electronics industry
- Automotive industry
- Robotics
- Print and paper industry
- Wood industry
- Palletizers



Hazardous point protection on an industrial robot



## Ordering information

### C4000 Advanced without extension connection

<b>Usage</b>	As a standalone system and as last system in a cascade
<b>Connection types</b>	System connection: Hirschmann plug M26 x 11 + FE, straight Configuration connection: M8 x 4

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301CA010	1018591	C40E-0301CB010	1018781
450 mm	C40S-0401CA010	1018347	C40E-0401CB010	1018782
600 mm	C40S-0601CA010	1018593	C40E-0601CB010	1018783
750 mm	C40S-0701CA010	1018595	C40E-0701CB010	1018784
900 mm	C40S-0901CA010	1018597	C40E-0901CB010	1018785
1050 mm	C40S-1001CA010	1018599	C40E-1001CB010	1018786
1200 mm	C40S-1201CA010	1018601	C40E-1201CB010	1018787
1350 mm	C40S-1301CA010	1018603	C40E-1301CB010	1018788
1500 mm	C40S-1501CA010	1018605	C40E-1501CB010	1018789
1650 mm	C40S-1601CA010	1018607	C40E-1601CB010	1018790
1800 mm	C40S-1801CA010	1018609	C40E-1801CB010	1018791

- Resolution: 20 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302CA010	1018613	C40E-0302CB010	1018792
450 mm	C40S-0402CA010	1018615	C40E-0402CB010	1018793
600 mm	C40S-0602CA010	1018617	C40E-0602CB010	1018794
750 mm	C40S-0702CA010	1018619	C40E-0702CB010	1018795
900 mm	C40S-0902CA010	1018621	C40E-0902CB010	1018796
1050 mm	C40S-1002CA010	1018623	C40E-1002CB010	1018797
1200 mm	C40S-1202CA010	1018625	C40E-1202CB010	1018798
1350 mm	C40S-1302CA010	1018627	C40E-1302CB010	1018799
1500 mm	C40S-1502CA010	1018629	C40E-1502CB010	1018800
1650 mm	C40S-1602CA010	1018631	C40E-1602CB010	1018801
1800 mm	C40S-1802CA010	1018633	C40E-1802CB010	1018802

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303CA010	1018635	C40E-0303CB010	1018803
450 mm	C40S-0403CA010	1018637	C40E-0403CB010	1018804
600 mm	C40S-0603CA010	1018639	C40E-0603CB010	1018805
750 mm	C40S-0703CA010	1018641	C40E-0703CB010	1018806
900 mm	C40S-0903CA010	1018643	C40E-0903CB010	1018807
1050 mm	C40S-1003CA010	1018645	C40E-1003CB010	1018809
1200 mm	C40S-1203CA010	1018647	C40E-1203CB010	1018810
1350 mm	C40S-1303CA010	1018649	C40E-1303CB010	1018811
1500 mm	C40S-1503CA010	1018651	C40E-1503CB010	1018812
1650 mm	C40S-1603CA010	1018653	C40E-1603CB010	1018813
1800 mm	C40S-1803CA010	1018655	C40E-1803CB010	1018814

## F

- Resolution: 40 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0304CA010	1018657	C40E-0304CB010	1018815
450 mm	C40S-0404CA010	1018659	C40E-0404CB010	1018816
600 mm	C40S-0604CA010	1018661	C40E-0604CB010	1018817
750 mm	C40S-0704CA010	1018663	C40E-0704CB010	1018818
900 mm	C40S-0904CA010	1018665	C40E-0904CB010	1018819
1050 mm	C40S-1004CA010	1018667	C40E-1004CB010	1018820
1200 mm	C40S-1204CA010	1018669	C40E-1204CB010	1018821
1350 mm	C40S-1304CA010	1018671	C40E-1304CB010	1018822
1500 mm	C40S-1504CA010	1018673	C40E-1504CB010	1018823
1650 mm	C40S-1604CA010	1018675	C40E-1604CB010	1018824
1800 mm	C40S-1804CA010	1018677	C40E-1804CB010	1018825

## C4000 Advanced with extension connection M26 x 11 + FE

<b>Usage</b>	As first or middle system in a cascade
<b>Connection types</b>	System connection: Hirschmann plug M26 x 11 + FE, straight Extension connection: Hirschmann socket M26 x 11 + FE Configuration connection: M8 x 4

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301DA010	1018690	C40E-0301DB010	1018827
450 mm	C40S-0401DA010	1018349	C40E-0401DB010	1018828
600 mm	C40S-0601DA010	1018692	C40E-0601DB010	1018829
750 mm	C40S-0701DA010	1018694	C40E-0701DB010	1018830
900 mm	C40S-0901DA010	1018696	C40E-0901DB010	1018831
1050 mm	C40S-1001DA010	1018698	C40E-1001DB010	1018832
1200 mm	C40S-1201DA010	1018700	C40E-1201DB010	1018833
1350 mm	C40S-1301DA010	1018702	C40E-1301DB010	1018834
1500 mm	C40S-1501DA010	1018704	C40E-1501DB010	1018835
1650 mm	C40S-1601DA010	1018706	C40E-1601DB010	1018836
1800 mm	C40S-1801DA010	1018708	C40E-1801DB010	1018837

- Resolution: 20 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302DA010	1018710	C40E-0302DB010	1018838
450 mm	C40S-0402DA010	1018712	C40E-0402DB010	1018839
600 mm	C40S-0602DA010	1018714	C40E-0602DB010	1018840
750 mm	C40S-0702DA010	1018716	C40E-0702DB010	1018841
900 mm	C40S-0902DA010	1018718	C40E-0902DB010	1018842
1050 mm	C40S-1002DA010	1018720	C40E-1002DB010	1018843
1200 mm	C40S-1202DA010	1018722	C40E-1202DB010	1018844
1350 mm	C40S-1302DA010	1018724	C40E-1302DB010	1018845
1500 mm	C40S-1502DA010	1018726	C40E-1502DB010	1018846
1650 mm	C40S-1602DA010	1018728	C40E-1602DB010	1018847
1800 mm	C40S-1802DA010	1018730	C40E-1802DB010	1018848

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303DA010	1018733	C40E-0303DB010	1018849
450 mm	C40S-0403DA010	1018735	C40E-0403DB010	1018850
600 mm	C40S-0603DA010	1018737	C40E-0603DB010	1018851
750 mm	C40S-0703DA010	1018739	C40E-0703DB010	1018852
900 mm	C40S-0903DA010	1018741	C40E-0903DB010	1018853
1050 mm	C40S-1003DA010	1018743	C40E-1003DB010	1018854
1200 mm	C40S-1203DA010	1018745	C40E-1203DB010	1018855
1350 mm	C40S-1303DA010	1018747	C40E-1303DB010	1018856
1500 mm	C40S-1503DA010	1018749	C40E-1503DB010	1018857
1650 mm	C40S-1603DA010	1018751	C40E-1603DB010	1018858
1800 mm	C40S-1803DA010	1018753	C40E-1803DB010	1018859

## F

- Resolution: 40 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0304DA010	1018755	C40E-0304DB010	1018860
450 mm	C40S-0404DA010	1018757	C40E-0404DB010	1018861
600 mm	C40S-0604DA010	1018759	C40E-0604DB010	1018862
750 mm	C40S-0704DA010	1018762	C40E-0704DB010	1018863
900 mm	C40S-0904DA010	1018765	C40E-0904DB010	1018864
1050 mm	C40S-1004DA010	1018767	C40E-1004DB010	1018865
1200 mm	C40S-1204DA010	1018769	C40E-1204DB010	1018866
1350 mm	C40S-1304DA010	1018771	C40E-1304DB010	1018867
1500 mm	C40S-1504DA010	1018773	C40E-1504DB010	1018868
1650 mm	C40S-1604DA010	1018775	C40E-1604DB010	1018869
1800 mm	C40S-1804DA010	1018777	C40E-1804DB010	1018870

## C4000 Advanced Host with extension connection M12 x 7 + FE

<b>Usage</b>	As first or middle system in a cascade
<b>Connection types</b>	System connection: Hirschmann plug M26 x 11 + FE, straight Extension connection: M12 x 7 + FE Configuration connection: M8 x 4

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301DA040	1028969	C40E-0301DB040	1028989
450 mm	C40S-0401DA040	1028967	C40E-0401DB040	1028990
600 mm	C40S-0601DA040	1028971	C40E-0601DB040	1028991
750 mm	C40S-0701DA040	1028973	C40E-0701DB040	1028992
900 mm	C40S-0901DA040	1028975	C40E-0901DB040	1028993
1050 mm	C40S-1001DA040	1028977	C40E-1001DB040	1028994
1200 mm	C40S-1201DA040	1028979	C40E-1201DB040	1028995
1350 mm	C40S-1301DA040	1028981	C40E-1301DB040	1028996
1500 mm	C40S-1501DA040	1028983	C40E-1501DB040	1028997
1650 mm	C40S-1601DA040	1028985	C40E-1601DB040	1028998
1800 mm	C40S-1801DA040	1028987	C40E-1801DB040	1028999

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303DA040	1029001	C40E-0303DB040	1029023
450 mm	C40S-0403DA040	1029003	C40E-0403DB040	1029024
600 mm	C40S-0603DA040	1029005	C40E-0603DB040	1029025
750 mm	C40S-0703DA040	1029007	C40E-0703DB040	1029026
900 mm	C40S-0903DA040	1029009	C40E-0903DB040	1029027
1050 mm	C40S-1003DA040	1029011	C40E-1003DB040	1029028
1200 mm	C40S-1203DA040	1029013	C40E-1203DB040	1029029
1350 mm	C40S-1303DA040	1029015	C40E-1303DB040	1029030
1500 mm	C40S-1503DA040	1029017	C40E-1503DB040	1029031
1650 mm	C40S-1603DA040	1029019	C40E-1603DB040	1029032
1800 mm	C40S-1803DA040	1029021	C40E-1803DB040	1029033

## C4000 Advanced Guest with straight system connection

<b>Usage</b>	As last system in a cascade, configurable via host
<b>Connection types</b>	System connection: fixed connection cable 320 mm with plug M12 x 7 + FE, straight

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C46S-0101CT400	1028796	C46E-0101CU400	1028820
300 mm	C46S-0301CT400	1028802	C46E-0301CU400	1028821
450 mm	C46S-0401CT400	1028804	C46E-0401CU400	1028822
600 mm	C46S-0601CT400	1028806	C46E-0601CU400	1028823
750 mm	C46S-0701CT400	1028808	C46E-0701CU400	1028824
900 mm	C46S-0901CT400	1040173	C46E-0901CU400	1040186
1050 mm	C46S-1001CT400	1040175	C46E-1001CU400	1040187
1200 mm	C46S-1201CT400	1040177	C46E-1201CU400	1040188
1350 mm	C46S-1301CT400	1040179	C46E-1301CU400	1040189
1500 mm	C46S-1501CT400	1040181	C46E-1501CU400	1040190
1650 mm	C46S-1601CT400	1040182	C46E-1601CU400	1040191
1800 mm	C46S-1801CT400	1040184	C46E-1801CU400	1040192

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C46S-0103CT400	1028879	C46E-0103CU400	1028889
300 mm	C46S-0303CT400	1028881	C46E-0303CU400	1028890
450 mm	C46S-0403CT400	1028883	C46E-0403CU400	1028891
600 mm	C46S-0603CT400	1028885	C46E-0603CU400	1028892
750 mm	C46S-0703CT400	1028887	C46E-0703CU400	1028893
900 mm	C46S-0903CT400	1040193	C46E-0903CU400	1040207
1050 mm	C46S-1003CT400	1040195	C46E-1003CU400	1040208
1200 mm	C46S-1203CT400	1040197	C46E-1203CU400	1040209
1350 mm	C46S-1303CT400	1040199	C46E-1303CU400	1040210
1500 mm	C46S-1503CT400	1040201	C46E-1503CU400	1040211
1650 mm	C46S-1603CT400	1040203	C46E-1603CU400	1040212
1800 mm	C46S-1803CT400	1040205	C46E-1803CU400	1040213

## C4000 Advanced Guest with angled system connection

<b>Usage</b>	As last system in a cascade, configurable via host
<b>Connection types</b>	System connection: fixed connection cable 320 mm with plug M12 x 7 + FE, angled

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C46S-0101CT500	1028810	C46E-0101CU500	1028825
300 mm	C46S-0301CT500	1028812	C46E-0301CU500	1028826
450 mm	C46S-0401CT500	1028814	C46E-0401CU500	1028827
600 mm	C46S-0601CT500	1028816	C46E-0601CU500	1028828
750 mm	C46S-0701CT500	1028818	C46E-0701CU500	1028829

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C46S-0103CT500	1028901	C46E-0103CU500	1028894
300 mm	C46S-0303CT500	1028903	C46E-0303CU500	1028895
450 mm	C46S-0403CT500	1028905	C46E-0403CU500	1028896
600 mm	C46S-0603CT500	1028907	C46E-0603CU500	1028897
750 mm	C46S-0703CT500	1028909	C46E-0703CU500	1028898

## UE402 switching amplifier

Description	Type	Part no.
Expands C4000 Standard, Advanced, Palletizer, Entry/Exit and Fusion with the functions described in the technical data, e.g., bypass, operating mode switching or in addition PSDI mode on C4000 Standard, Advanced.	UE402	1023577

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### C4000 Advanced

#### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm ... 40 mm	
Scanning range (depending on type)	-	0 m ... 8 m / 0 m ... 19 m
Protective field height (depending on type)	300 mm ... 1800 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 26 ms <sup>1)</sup>
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

<sup>1)</sup> Without beam coding, without blanking, no cascaded systems. Other response times, see operating instructions.

#### Functional data

System part	Sender	Receiver
Restart interlock	-	✓
Restart interlock (delivery status)	-	External
External device monitoring	-	✓
External device monitoring (delivery status)	-	Deactivated
Beam coding	✓	
Beam coding (delivery status)	Non-coded	
Reduced resolution (depending on type)	- / ✓	✓
Extension connection (depending on type)	- / ✓	
Emergency stop / bypass at extension connection (depending on type)	-	- / ✓
Bypass (with UE402)	-	✓
Operating mode switching (with UE402)	-	✓
PSDI mode (with UE402)	✓	
Safe device communication via EFI/SDL	✓	
Configuration method	PC with CDS (configuration and diagnostic software)	



## Electrical data

System part	Sender	Receiver
System connection	Hirschmann plug M26 x 11 + FE	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Extension connection (depending on type)	Hirschmann socket M26 x 11 + FE / socket M12 x 7 + FE	
Connection cable wire cross-section	M26 x 11 + FE	0.75 mm <sup>2</sup>
	M12 x 7 + FE	0.25 mm <sup>2</sup>
Configuration connection	M8 x 4	
Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 10 % <sup>3)</sup>	
Power consumption	Max. 2 A	Max. 3 A
Safety outputs (OSSD)	Type of output	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
	Switching voltage HIGH	24 V DC (V <sub>S</sub> - 2.25 V DC ... V <sub>S</sub> )
	Switching voltage LOW	2 V DC
	Switching current	Max. 500 mA
Display elements	7-segment	

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of V<sub>S</sub>.

## C4000 Advanced Guest

## General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Scanning range (depending on type)	-	0 m ... 8 m / 0 m ... 19 m
Protective field height (depending on type)	150 mm ... 1800 mm	
Safety related parameters	Type	Type 4 (IEC 61496)
	Safety integrity level	SIL3 (IEC 61508)
		SILCL3 (IEC 62061)
	Category	Category 4 (EN ISO 13849)
	Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	1.5 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 26 ms <sup>1)</sup>
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

<sup>1)</sup> Without beam coding, without blanking. Other response times, see operating instructions.

## Functional data

System part	Sender	Receiver
Beam coding		✓
Beam coding (delivery status)	Non-coded	
Reduced resolution	-	✓
PSDI mode (with UE402)		✓
Configuration method	PC with CDS (configuration and diagnostic software)	

## Electrical data

System part	Sender	Receiver
System connection (depending on type)	Fixed connection cable 320 mm with plug M12 x 7 + FE, straight Fixed connection cable 320 mm with plug M12 x 7 + FE, angled	
Connecting cable length	Max. 3 m <sup>1)</sup>	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 10 % <sup>3)</sup>	
Power consumption	Max. 2 A	Max. 3 A
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	24 V DC ( $V_S - 2.25$ V DC ... $V_S$ )
Switching voltage LOW	-	2 V DC
Switching current	-	Max. 500 mA
Display elements	7-segment	

<sup>1)</sup> Between host and guest

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of  $V_S$ .

## UE402 switching amplifier

### General data

Protection class	III (IEC 536:1976)
Enclosure rating	IP 20 (IEC 60529)
Safety related parameters	
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$15 \times 10^{-9}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	0 °C ... +55 °C
Air humidity from ... to	15 % ... 95 %, non-condensing
Storage temperature from ... to	-25 °C ... +70 °C
Weight	120 g
Housing material	Plastic

### Functional data

PSDI mode	✓
Bypass	✓
Operating mode switching	✓

### Electrical data

Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC)
Residual ripple	≤ 10 %
Power consumption	Max. 110 mA
Switch-on time	Max. 4 s
IN A1 ... A6, MCC-BDC, MCC-TDC	
Switching voltage HIGH	24 V DC (11 V DC ... 30 V DC)
Switching voltage LOW	-30 V DC ... 5 V DC
Switching current HIGH	6 mA ... 20 mA
Switching current LOW	-3 mA ... 0.5 mA
Change over time operating mode selection	Max. 2 s
IN B1, IN B2, OUT B1, OUT B2	
Change over time bypass	Max. 2 s
Synchronous time monitoring	200 ms

### Safety outputs

Connection type	Screw-terminal connector
Conductor cross-section	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

F

# Dimensional drawings

## C4000 Advanced without extension connection

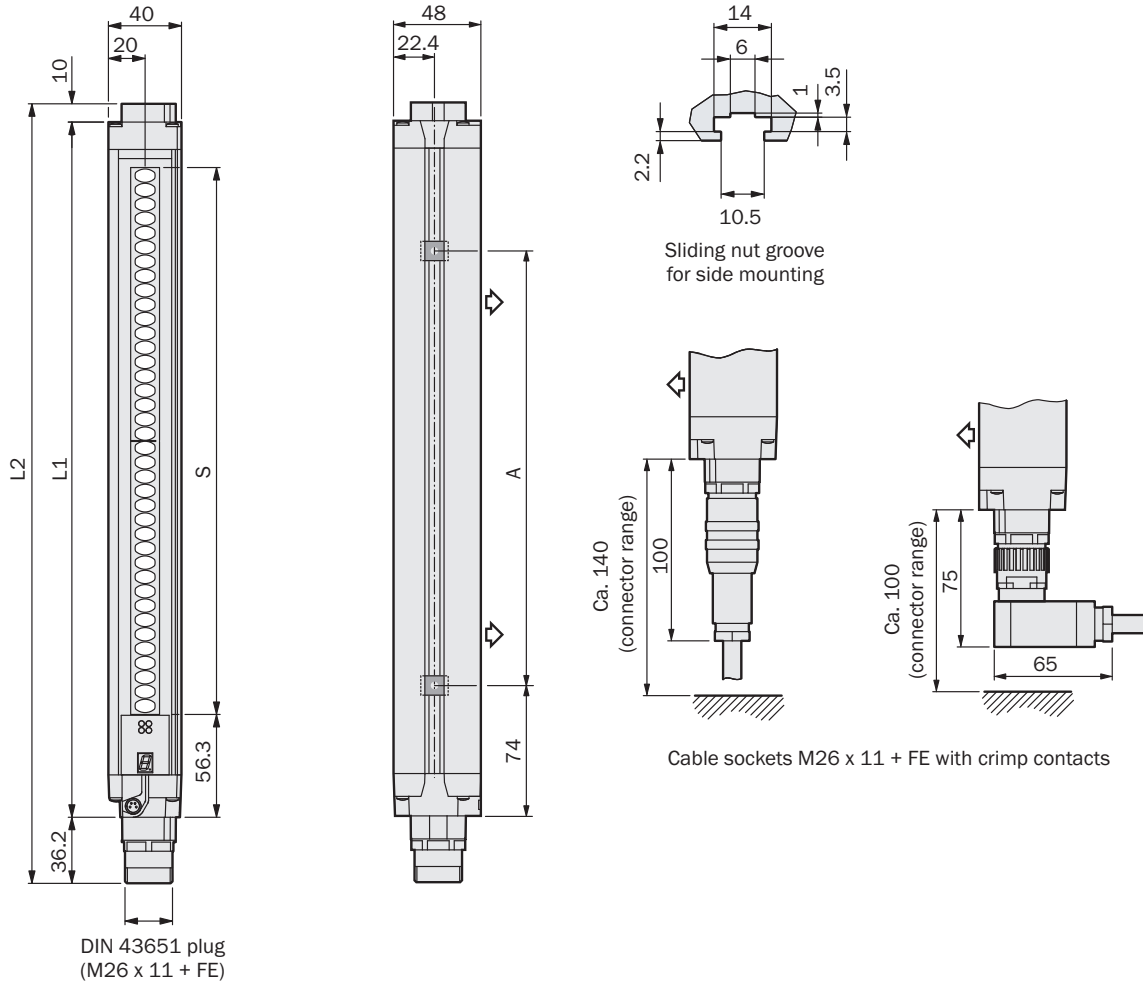


Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	381	427	224
450	532	578	374
600	682	728	524
750	833	879	674
900	984	1030	824
1050	1134	1180	974
1200	1283	1329	1124
1350	1435	1481	1274
1500	1586	1632	1424
1650	1736	1782	1574
1800	1887	1933	1724

Dimensions in mm

**C4000 Advanced with extension connection M26 x 11 + FE**

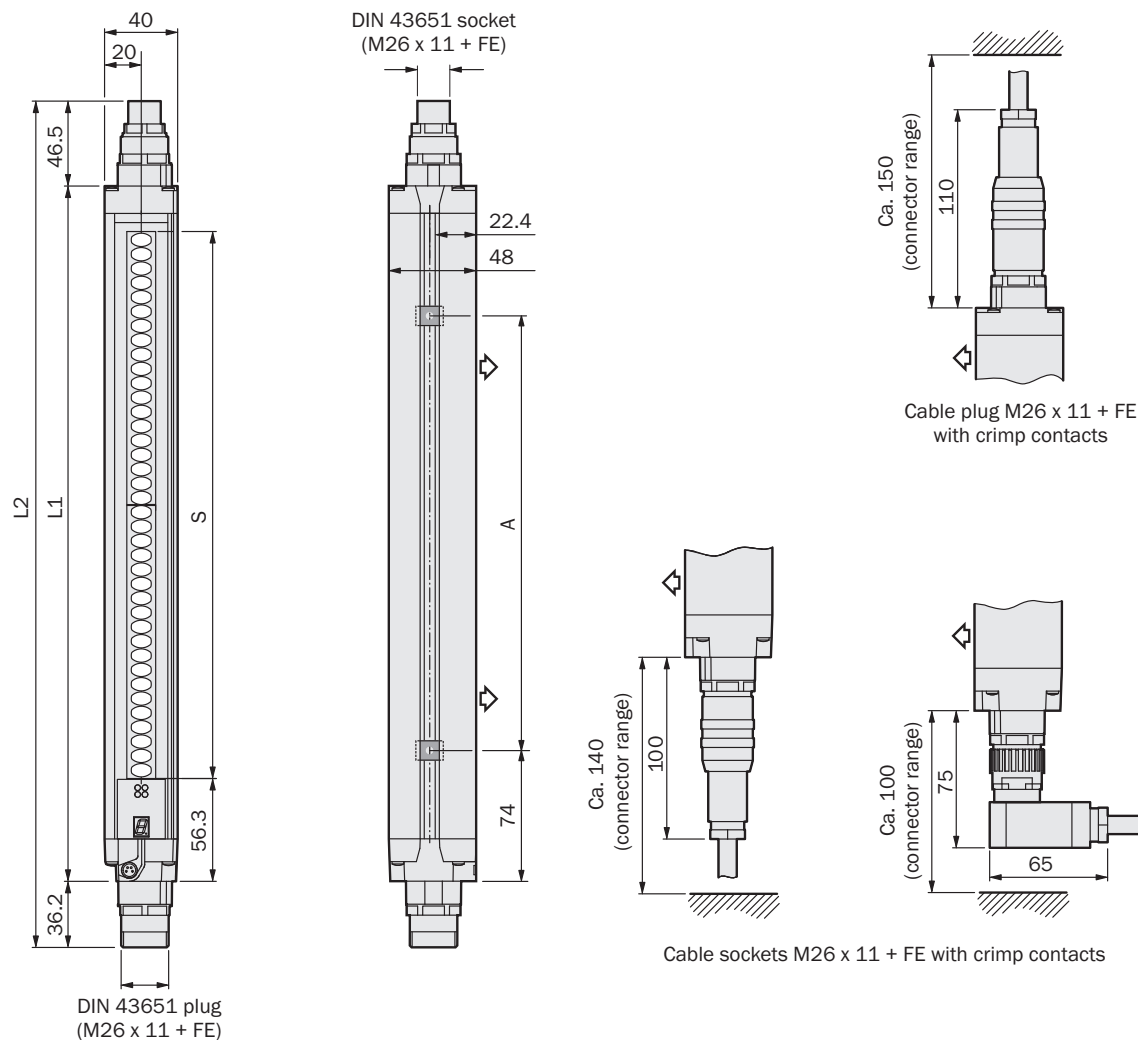


Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	381	464	224
450	532	614	374
600	682	765	524
750	833	915	674
900	984	1066	824
1050	1134	1216	974
1200	1283	1366	1124
1350	1435	1517	1274
1500	1586	1669	1424
1650	1736	1818	1574
1800	1887	1969	1724

Dimensions in mm

C4000 Advanced Host with extension connection M12 x 7 + FE

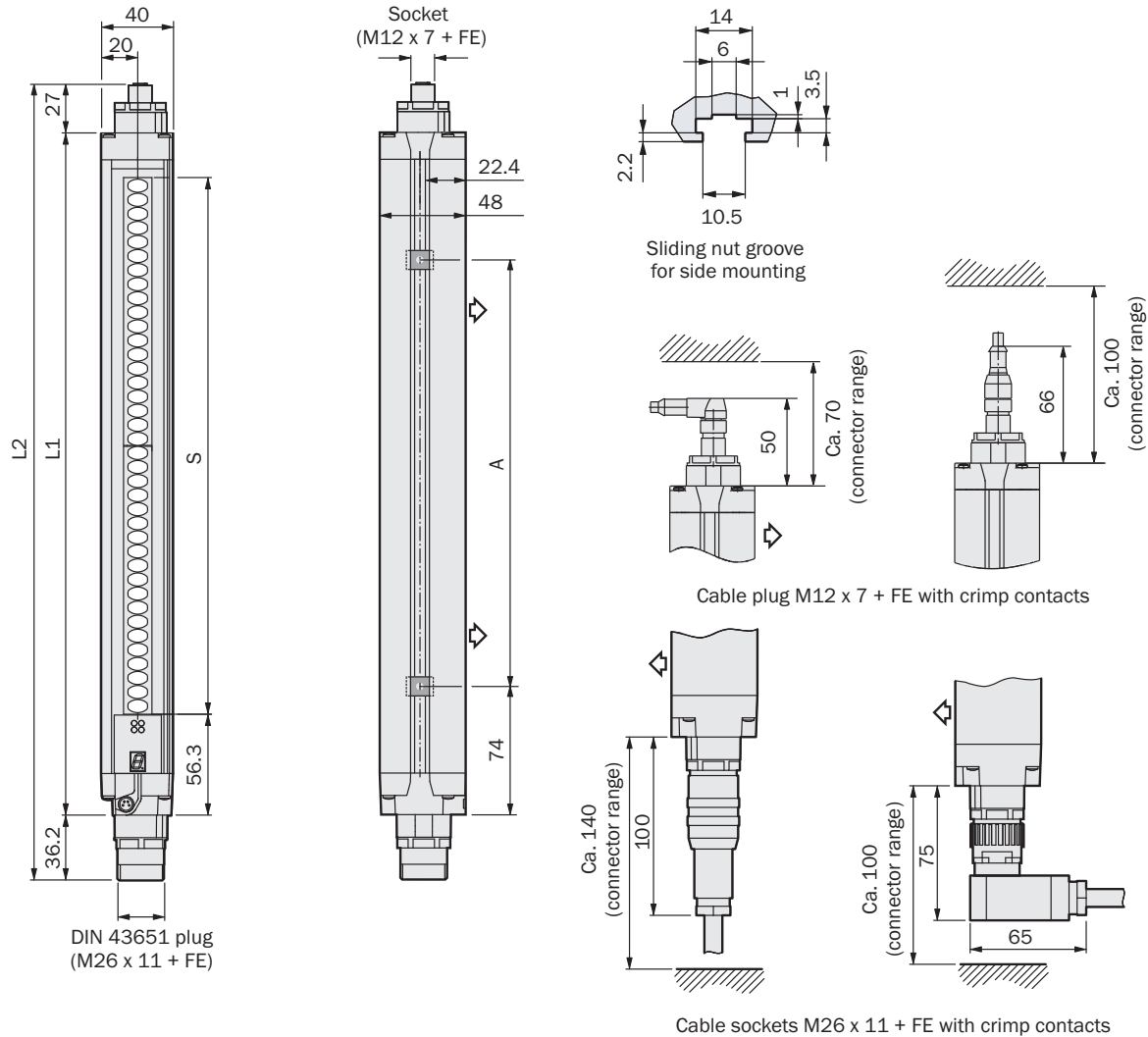


Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	381	444	224
450	532	594	374
600	682	744	524
750	833	895	674
900	984	1046	824
1050	1134	1196	974
1200	1283	1346	1124
1350	1435	1497	1274
1500	1586	1649	1424
1650	1736	1798	1574
1800	1887	1949	1724

Dimensions in mm



C4000 Advanced Guest

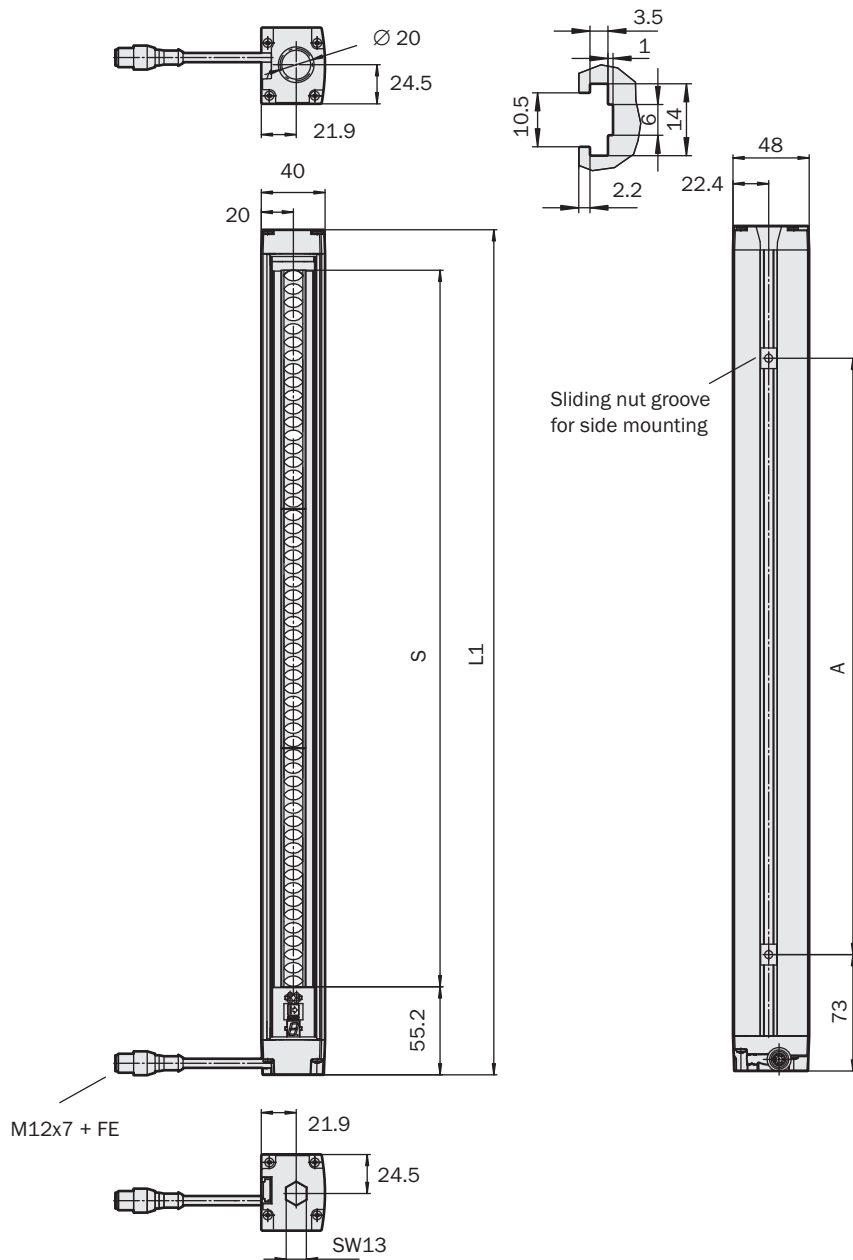


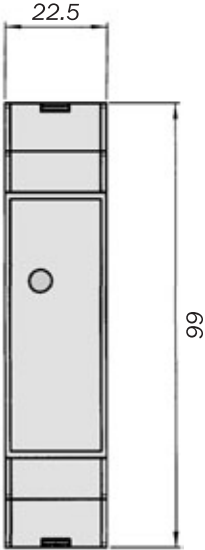
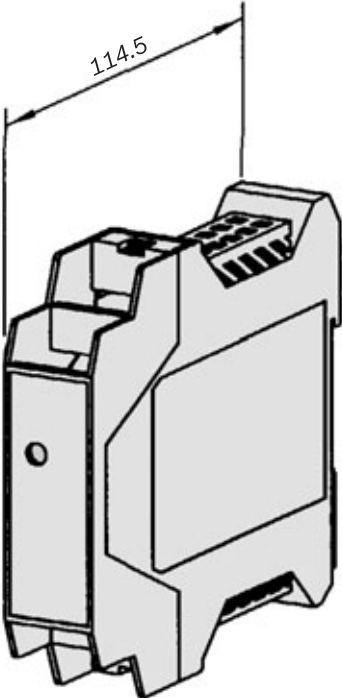
Illustration sender (receiver mirror image)

Protective field height S	L1	A
150	220	76
300	380	224
450	530	374
600	680	524
750	830	674
900	981	825
1050	1131	975
1200	1281	1125
1350	1432	1275
1500	1583	1427
1650	1733	1504
1800	1884	1728

Dimensions in mm

UE402 switching amplifier

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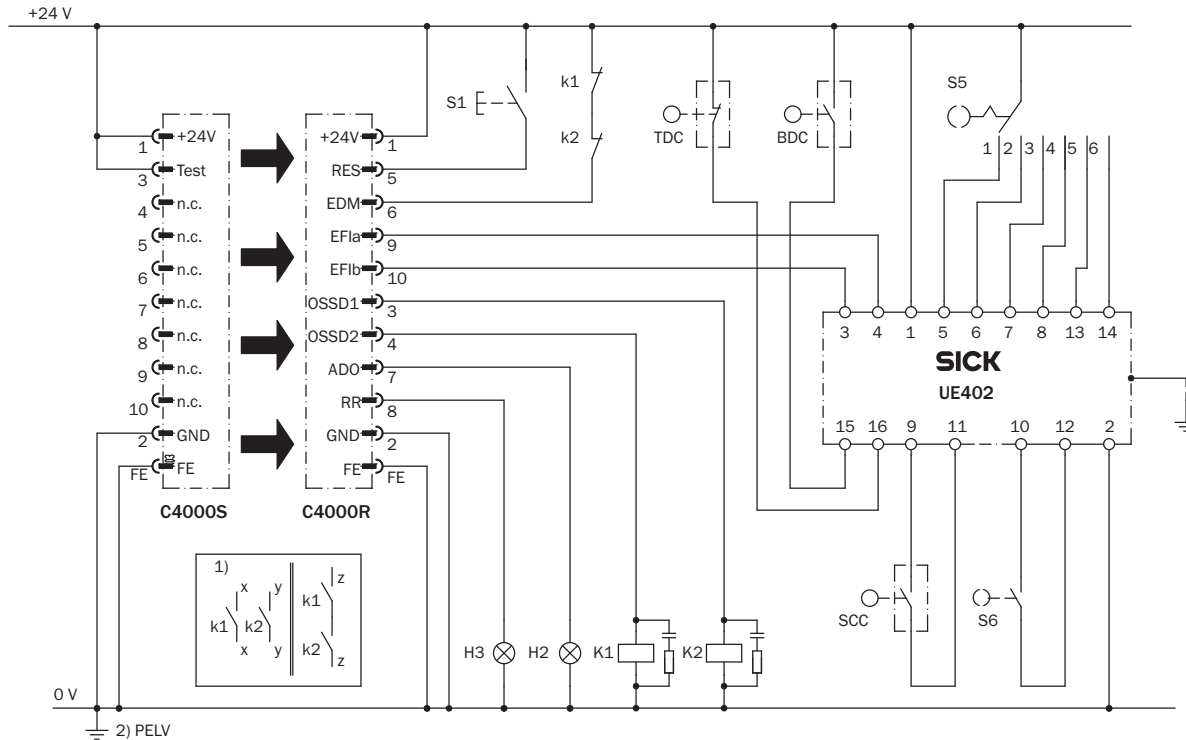
Dimensions in mm



# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## C4000 Advanced on UE402 switching amplifier



### Task

Integration of a C4000 Advanced safety light curtain with UE402 in a controller. Six configurable operating modes with restart interlock and external device monitoring. PSDI mode with TDC, BDC, SCC. Teachable blanking areas.

### Operating characteristics

If no object is detected in the active protective field and the K1 and K2 contactors are in the de-energized position, the H3 lamp flashes as a prompt to operate S1 control switch. The OSSDs are switched on when S1 is operated (button is pressed and released). These outputs activate K1 and K2 contactors. Upon the detection of an object in an active protective field, the OSSDs deactivate K1 and K2 contactors.

### Fault analysis

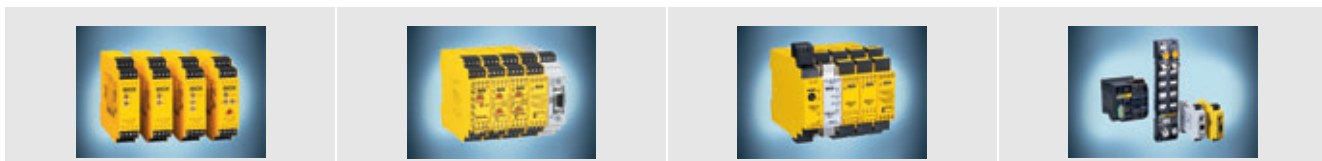
The incorrect functioning of one of the K1 or K2 contactors does not result in the loss of the shutdown function. OSSD cross-

circuits and short-circuits are detected and lead to the inhibited state (lock-out). On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits.

### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
  - 2) PELV in accordance with the requirements in EN 60204-1 / 6.4
- Please see the operating instructions for the related devices to obtain information on the effects of the functions with configurable parameters. This information is to be observed.

## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847
	Mounting kit C4000 Guest, swivel mount	4	BEF-2WNAEEST4	2034959
	Mounting kit 11, replacement bracket, suitable for replacement of FGS	4	BEF-3WNGBCST4	2021646


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600



### Connecting cables

Figure	Cable length	Remark	Type	Part no.
	By the meter	Fitting for EFI connections	Connection cable	6021437



## Connecting cables (cont'd)

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	DOL-0612G2M5075KM0	2022544
			5 m	DOL-0612G05M075KM0	2022545
			7.5 m	DOL-0612G7M5075KM0	2022546
			10 m	DOL-0612G10M075KM0	2022547
			15 m	DOL-0612G15M075KM0	2022548
			20 m	DOL-0612G20M075KM0	2022549
			30 m	DOL-0612G30M075KM0	2022550
			50 m	DOL-0612G50MD75KM0	2033548



## Connectors

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable plug M26 x 11 + FE	Straight	STE-0612G000GA3KM0	6021191
		Angled	STE-0612W000GA3KM0	6021192


## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758


## Cascade connection cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann M26 x 11 + FE	Plug straight/ socket straight	0.25 m	DSL-0612GM25075KM0	2022278
			0.5 m	DSL-0612G0M5075KM0	2021838
			1 m	DSL-0612G01M075KM0	2022279
			1.5 m	DSL-0612G1M5075KM0	2022280
			2 m	DSL-0612G02M075KM0	2022281
			2.5 m	DSL-0612G2M5075KM0	2022282
			3 m	DSL-0612G03M075KM0	2022283
	Hirschmann M26 x 11 + FE	Plug straight/ socket angled	0.25 m	DSL-0612BM25075KM0	2022284
			0.5 m	DSL-0612B0M5075KM0	2022285
			1 m	DSL-0612B01M075KM0	2022286
			1.5 m	DSL-0612B1M5075KM0	2022287
			2 m	DSL-0612B02M075KM0	2022288
			2.5 m	DSL-0612B2M5075KM0	2022289
			3 m	DSL-0612B03M075KM0	2022290
	M12 x 8	Plug straight/ socket straight	1 m	DSL-127SG01ME25KM0	6021002
		Plug angled/ socket straight	1 m	DSL-127SA01ME25KM0	6030974

## Control switch connection cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann M26 x 7 + FE	Plug straight	2.5 m	STL-0608G2M5075KM1	2026869
			10 m	STL-0608G10M075KM1	2026870


## Configuration connection cables

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649


## Terminators

Description	Remark	Type	Part no.
Terminal with 182 Ω resistance for pin 9 and 10 on the system connection	For improving the EMC behavior if EFI device communication is not used	Terminal with 182 Ω resistance	2027227

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves

Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

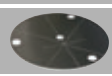



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## Mirror columns with protective field height mirror

Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0

## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Additional front screens

Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2022412
	450 mm	2022413
	600 mm	2022414
	750 mm	2022415
	900 mm	2022416
	1050 mm	2022417
	1200 mm	2022418
	1350 mm	2022419
	1500 mm	2022420
	1650 mm	2022421
	1800 mm	2022422

**Additional heavy-duty front screens**


Figure	Suitable for protective field height	Part no.
 <p>Example of use</p>	300 mm	2026853
	450 mm	2026854
	600 mm	2026855
	750 mm	2026856
	900 mm	2026857
	1050 mm	2026858
	1200 mm	2026859
	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863

**PNS75 deflector mirrors**



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Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
		1800 mm	PNS75-184	1019424

**PNS125 deflector mirrors**

Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435



## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731



## Configuration software

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

## Configuration tools

Figure	Description	Type	Part no.
	For saving and transferring configurations. For C4000 Standard, Advanced, Palletizer, Entry/Exit, Fusion and M4000 Advanced, Advanced Curtain, Area	Clone Plug for C4000 and M4000	1029665
	For resetting a system position saved in a C4000 (host, guest 1, guest 2). For C4000 Standard, Advanced, Palletizer, Entry/Exit	Host-Guest Plug for C4000	1029717
	-	Wall mount	5318443

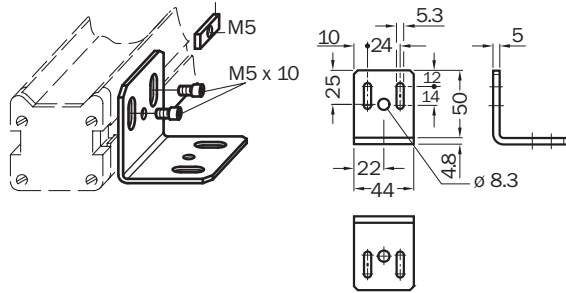
## Device protection

Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	20 mm diameter	Test rod	2022600
	30 mm diameter	Test rod	2022602
	40 mm diameter	Test rod	2022604
	Test rod holder	BEF-3WNAAAAL1	2052249

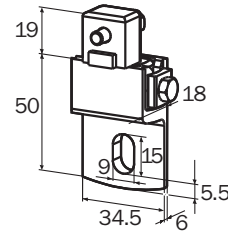
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Dimensional drawings mounting systems

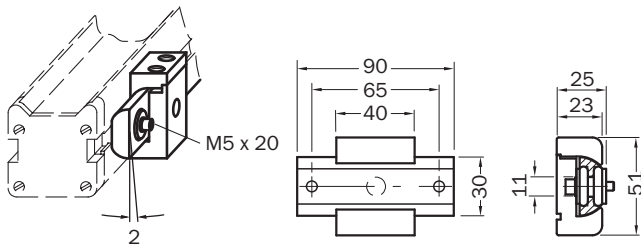
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



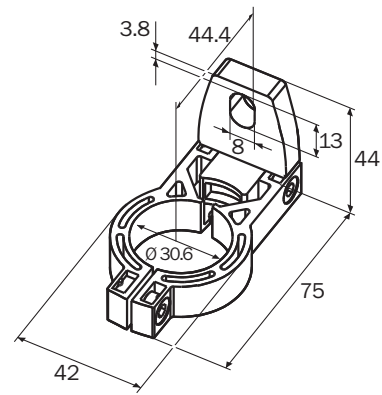
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



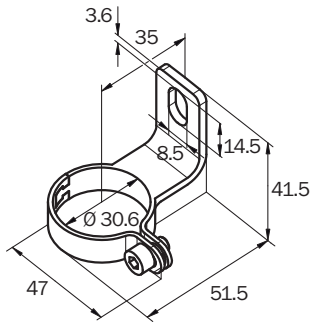
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



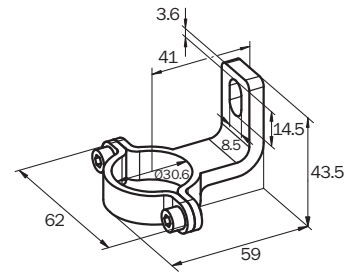
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



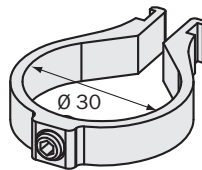
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



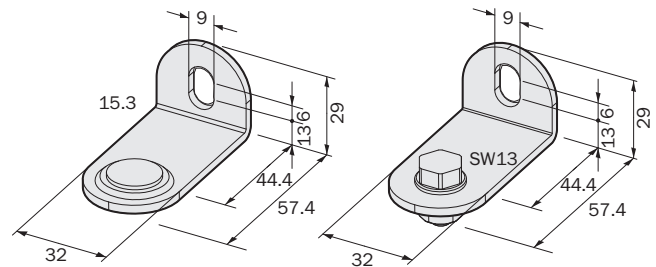
**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2SMMEAAL4, BEF-2SMMEAAL2**  
Omega bracket, flexible and quick installation with only one screw



**BEF-2WNAEEST4**  
Mounting kit C4000 Guest, swivel mount

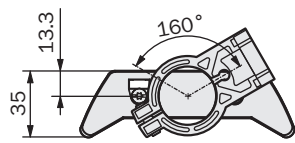


Dimensions in mm

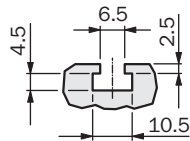
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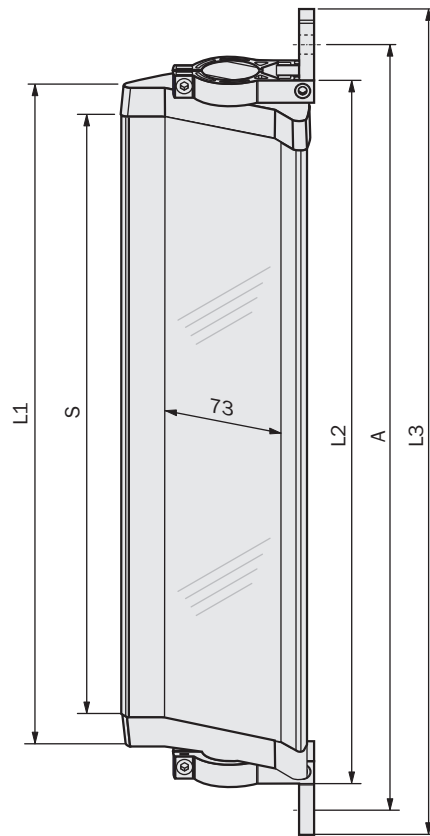
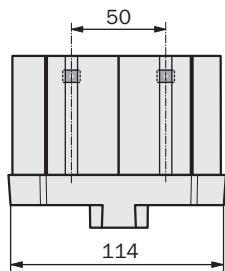
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

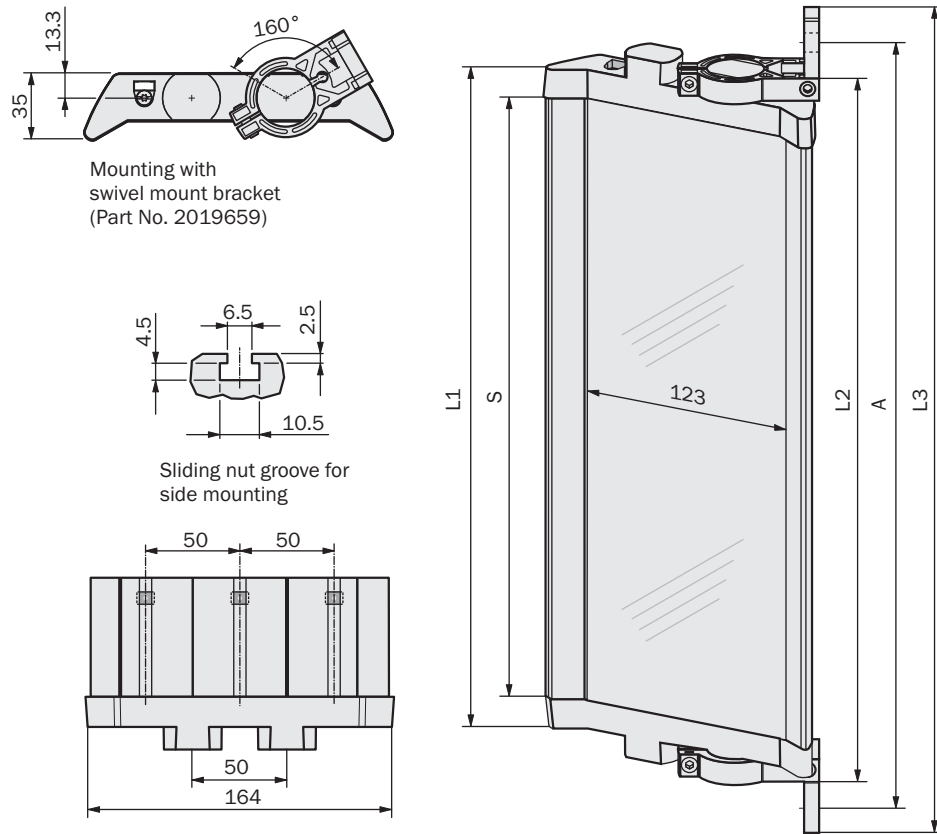


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

## Technical data overview

Protective field height (depending on type)	150 mm ... 1800 mm
Scanning range (depending on type)	0 m ... 8 m / 0 m ... 19 m
Resolution (depending on type)	14 mm ... 40 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Standard safety light curtain is used wherever hazardous points and hazardous areas require reliable and cost-effective protection:

- Alignment and diagnostics via 7-segment display
- Application diagnostic output for status information
- Configuration and diagnostics via RS-232 interface

- Emergency stop button or reset button directly at the extension connection
- Rapid commissioning due to preconfigured devices
- Configure quickly and easily using Clone Plug
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

Combined with SICK safe control solutions

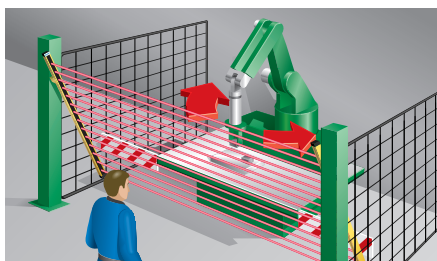
Combination with	Restart interlock	External device monitoring	Bypass	PSD/PSDI window	Teach-in	Operating mode selection	Further information
UE402	-	-	✓	✓	✓	✓	F-47
Flexi Classic	✓	✓	✓	-	-	-	O-2
Flexi Soft	✓	✓	✓	✓	✓	✓	O-25
UE48-20S	✓	✓	-	-	-	-	N-46
UE48-30S	✓	✓	-	-	-	-	N-52
UE10-30S	Contact expansion module						N-63

→ For more combinations, see annex

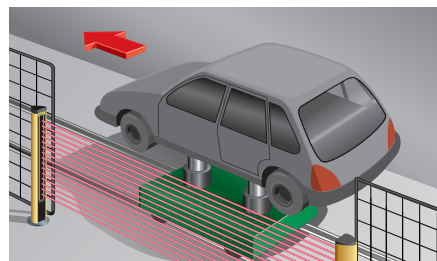
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

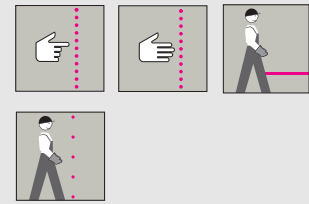
- Automotive industry
- Transforming machine tools
- Plastic
- Electronic
- Robotics
- Print and paper industry
- Wood industry
- Palletizer



Hazardous point protection on an industrial robot



Hazardous point protection on an assembly line



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- External device monitoring (EDM)
- Restart interlock (RES)
- Beam coding
- Up to 3 systems can be cascaded
- Alignment and diagnostics via 7-segment display
- Configuration and diagnostics via PC



Further information	Page
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→ Technical specifications	F-45
→ Dimensional drawings	F-49
→ Connection diagrams	F-55
→ Accessories	F-56
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C4000 Standard without extension connection

<b>Usage</b>	As a standalone system and as last system in a cascade
<b>Connection types</b>	System connection: Hirschmann plug M26 x 11 + FE, straight Configuration connection: M8 x 4

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301CA010	1018591	C40E-0301CA010	1018592
450 mm	C40S-0401CA010	1018347	C40E-0401CA010	1018348
600 mm	C40S-0601CA010	1018593	C40E-0601CA010	1018594
750 mm	C40S-0701CA010	1018595	C40E-0701CA010	1018596
900 mm	C40S-0901CA010	1018597	C40E-0901CA010	1018598
1050 mm	C40S-1001CA010	1018599	C40E-1001CA010	1018600
1200 mm	C40S-1201CA010	1018601	C40E-1201CA010	1018602
1350 mm	C40S-1301CA010	1018603	C40E-1301CA010	1018604
1500 mm	C40S-1501CA010	1018605	C40E-1501CA010	1018606
1650 mm	C40S-1601CA010	1018607	C40E-1601CA010	1018608
1800 mm	C40S-1801CA010	1018609	C40E-1801CA010	1018610

- Resolution: 20 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302CA010	1018613	C40E-0302CA010	1018614
450 mm	C40S-0402CA010	1018615	C40E-0402CA010	1018616
600 mm	C40S-0602CA010	1018617	C40E-0602CA010	1018618
750 mm	C40S-0702CA010	1018619	C40E-0702CA010	1018620
900 mm	C40S-0902CA010	1018621	C40E-0902CA010	1018622
1050 mm	C40S-1002CA010	1018623	C40E-1002CA010	1018624
1200 mm	C40S-1202CA010	1018625	C40E-1202CA010	1018626
1350 mm	C40S-1302CA010	1018627	C40E-1302CA010	1018628
1500 mm	C40S-1502CA010	1018629	C40E-1502CA010	1018630
1650 mm	C40S-1602CA010	1018631	C40E-1602CA010	1018632
1800 mm	C40S-1802CA010	1018633	C40E-1802CA010	1018634

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303CA010	1018635	C40E-0303CA010	1018636
450 mm	C40S-0403CA010	1018637	C40E-0403CA010	1018638
600 mm	C40S-0603CA010	1018639	C40E-0603CA010	1018640
750 mm	C40S-0703CA010	1018641	C40E-0703CA010	1018642
900 mm	C40S-0903CA010	1018643	C40E-0903CA010	1018644
1050 mm	C40S-1003CA010	1018645	C40E-1003CA010	1018646
1200 mm	C40S-1203CA010	1018647	C40E-1203CA010	1018648
1350 mm	C40S-1303CA010	1018649	C40E-1303CA010	1018650
1500 mm	C40S-1503CA010	1018651	C40E-1503CA010	1018652
1650 mm	C40S-1603CA010	1018653	C40E-1603CA010	1018654
1800 mm	C40S-1803CA010	1018655	C40E-1803CA010	1018656

- Resolution: 40 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0304CA010	1018657	C40E-0304CA010	1018658
450 mm	C40S-0404CA010	1018659	C40E-0404CA010	1018660
600 mm	C40S-0604CA010	1018661	C40E-0604CA010	1018662
750 mm	C40S-0704CA010	1018663	C40E-0704CA010	1018664
900 mm	C40S-0904CA010	1018665	C40E-0904CA010	1018666
1050 mm	C40S-1004CA010	1018667	C40E-1004CA010	1018668
1200 mm	C40S-1204CA010	1018669	C40E-1204CA010	1018670
1350 mm	C40S-1304CA010	1018671	C40E-1304CA010	1018672
1500 mm	C40S-1504CA010	1018673	C40E-1504CA010	1018674
1650 mm	C40S-1604CA010	1018675	C40E-1604CA010	1018676
1800 mm	C40S-1804CA010	1018677	C40E-1804CA010	1018678

### C4000 Standard with angled system connection, without extension connection

<b>Usage</b>	As a standalone system and as last system in a cascade
<b>Connection types</b>	System connection: Hirschmann plug M26 x 11 + FE, angled Configuration connection: M8 x 4

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301CA020	1022267	C40E-0301CA020	1022268
450 mm	C40S-0401CA020	1026737	C40E-0401CA020	1026738

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303CA020	1026733	C40E-0303CA020	1026734
450 mm	C40S-0403CA020	1026735	C40E-0403CA020	1026736

## C4000 Standard with extension connection M26 x 11 + FE

<b>Usage</b>	As first or middle system in a cascade
<b>Connection types</b>	System connection: Hirschmann plug M26 x 11 + FE, straight Extension connection: Hirschmann socket M26 x 11 + FE Configuration connection: M8 x 4

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301DA010	1018690	C40E-0301DA010	1018691
450 mm	C40S-0401DA010	1018349	C40E-0401DA010	1018350
600 mm	C40S-0601DA010	1018692	C40E-0601DA010	1018693
750 mm	C40S-0701DA010	1018694	C40E-0701DA010	1018695
900 mm	C40S-0901DA010	1018696	C40E-0901DA010	1018697
1050 mm	C40S-1001DA010	1018698	C40E-1001DA010	1018699
1200 mm	C40S-1201DA010	1018700	C40E-1201DA010	1018701
1350 mm	C40S-1301DA010	1018702	C40E-1301DA010	1018703
1500 mm	C40S-1501DA010	1018704	C40E-1501DA010	1018705
1650 mm	C40S-1601DA010	1018706	C40E-1601DA010	1018707
1800 mm	C40S-1801DA010	1018708	C40E-1801DA010	1018709

- Resolution: 20 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302DA010	1018710	C40E-0302DA010	1018711
450 mm	C40S-0402DA010	1018712	C40E-0402DA010	1018713
600 mm	C40S-0602DA010	1018714	C40E-0602DA010	1018715
750 mm	C40S-0702DA010	1018716	C40E-0702DA010	1018717
900 mm	C40S-0902DA010	1018718	C40E-0902DA010	1018719
1050 mm	C40S-1002DA010	1018720	C40E-1002DA010	1018721
1200 mm	C40S-1202DA010	1018722	C40E-1202DA010	1018723
1350 mm	C40S-1302DA010	1018724	C40E-1302DA010	1018725
1500 mm	C40S-1502DA010	1018726	C40E-1502DA010	1018727
1650 mm	C40S-1602DA010	1018728	C40E-1602DA010	1018729
1800 mm	C40S-1802DA010	1018730	C40E-1802DA010	1018731

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303DA010	1018733	C40E-0303DA010	1018734
450 mm	C40S-0403DA010	1018735	C40E-0403DA010	1018736
600 mm	C40S-0603DA010	1018737	C40E-0603DA010	1018738
750 mm	C40S-0703DA010	1018739	C40E-0703DA010	1018740
900 mm	C40S-0903DA010	1018741	C40E-0903DA010	1018742
1050 mm	C40S-1003DA010	1018743	C40E-1003DA010	1018744
1200 mm	C40S-1203DA010	1018745	C40E-1203DA010	1018746
1350 mm	C40S-1303DA010	1018747	C40E-1303DA010	1018748
1500 mm	C40S-1503DA010	1018749	C40E-1503DA010	1018750
1650 mm	C40S-1603DA010	1018751	C40E-1603DA010	1018752
1800 mm	C40S-1803DA010	1018753	C40E-1803DA010	1018754

- Resolution: 40 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0304DA010	1018755	C40E-0304DA010	1018756
450 mm	C40S-0404DA010	1018757	C40E-0404DA010	1018758
600 mm	C40S-0604DA010	1018759	C40E-0604DA010	1018760
750 mm	C40S-0704DA010	1018762	C40E-0704DA010	1018763
900 mm	C40S-0904DA010	1018765	C40E-0904DA010	1018766
1050 mm	C40S-1004DA010	1018767	C40E-1004DA010	1018768
1200 mm	C40S-1204DA010	1018769	C40E-1204DA010	1018770
1350 mm	C40S-1304DA010	1018771	C40E-1304DA010	1018772
1500 mm	C40S-1504DA010	1018773	C40E-1504DA010	1018774
1650 mm	C40S-1604DA010	1018775	C40E-1604DA010	1018776
1800 mm	C40S-1804DA010	1018777	C40E-1804DA010	1018778

## C4000 Standard Host with extension connection M12 x 7 + FE

<b>Usage</b>	As first or middle system in a cascade
<b>Connection types</b>	System connection: Hirschmann plug M26 x 11 + FE, straight Extension connection: M12 x 7 + FE Configuration connection: M8 x 4

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301DA040	1028969	C40E-0301DA040	1028970
450 mm	C40S-0401DA040	1028967	C40E-0401DA040	1028968
600 mm	C40S-0601DA040	1028971	C40E-0601DA040	1028972
750 mm	C40S-0701DA040	1028973	C40E-0701DA040	1028974
900 mm	C40S-0901DA040	1028975	C40E-0901DA040	1028976
1050 mm	C40S-1001DA040	1028977	C40E-1001DA040	1028978
1200 mm	C40S-1201DA040	1028979	C40E-1201DA040	1028980
1350 mm	C40S-1301DA040	1028981	C40E-1301DA040	1028982
1500 mm	C40S-1501DA040	1028983	C40E-1501DA040	1028984
1650 mm	C40S-1601DA040	1028985	C40E-1601DA040	1028986
1800 mm	C40S-1801DA040	1028987	C40E-1801DA040	1028988

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303DA040	1029001	C40E-0303DA040	1029002
450 mm	C40S-0403DA040	1029003	C40E-0403DA040	1029004
600 mm	C40S-0603DA040	1029005	C40E-0603DA040	1029006
750 mm	C40S-0703DA040	1029007	C40E-0703DA040	1029008
900 mm	C40S-0903DA040	1029009	C40E-0903DA040	1029010
1050 mm	C40S-1003DA040	1029011	C40E-1003DA040	1029012
1200 mm	C40S-1203DA040	1029013	C40E-1203DA040	1029014
1350 mm	C40S-1303DA040	1029015	C40E-1303DA040	1029016
1500 mm	C40S-1503DA040	1029017	C40E-1503DA040	1029018
1650 mm	C40S-1603DA040	1029019	C40E-1603DA040	1029020
1800 mm	C40S-1803DA040	1029021	C40E-1803DA040	1029022



## C4000 Standard Guest with straight system connection

<b>Usage</b>	As last system in a cascade, configurable via host
<b>Connection types</b>	System connection: fixed connection cable 320 mm with plug M12 x 7 + FE, straight

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C46S-0101CT400	1028796	C46E-0101CT400	1028797
300 mm	C46S-0301CT400	1028802	C46E-0301CT400	1028803
450 mm	C46S-0401CT400	1028804	C46E-0401CT400	1028805
600 mm	C46S-0601CT400	1028806	C46E-0601CT400	1028807
750 mm	C46S-0701CT400	1028808	C46E-0701CT400	1028809
900 mm	C46S-0901CT400	1040173	C46E-0901CT400	1040174
1050 mm	C46S-1001CT400	1040175	C46E-1001CT400	1040176
1200 mm	C46S-1201CT400	1040177	C46E-1201CT400	1040178
1350 mm	C46S-1301CT400	1040179	C46E-1301CT400	1040180
1500 mm	C46S-1501CT400	1040181	C46E-1501CT400	1040214
1650 mm	C46S-1601CT400	1040182	C46E-1601CT400	1040183
1800 mm	C46S-1801CT400	1040184	C46E-1801CT400	1040185

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C46S-0103CT400	1028879	C46E-0103CT400	1028880
300 mm	C46S-0303CT400	1028881	C46E-0303CT400	1028882
450 mm	C46S-0403CT400	1028883	C46E-0403CT400	1028884
600 mm	C46S-0603CT400	1028885	C46E-0603CT400	1028886
750 mm	C46S-0703CT400	1028887	C46E-0703CT400	1028888
900 mm	C46S-0903CT400	1040193	C46E-0903CT400	1040194
1050 mm	C46S-1003CT400	1040195	C46E-1003CT400	1040196
1200 mm	C46S-1203CT400	1040197	C46E-1203CT400	1040198
1350 mm	C46S-1303CT400	1040199	C46E-1303CT400	1040200
1500 mm	C46S-1503CT400	1040201	C46E-1503CT400	1040202
1650 mm	C46S-1603CT400	1040203	C46E-1603CT400	1040204
1800 mm	C46S-1803CT400	1040205	C46E-1803CT400	1040206

## C4000 Standard Guest with angled system connection

<b>Usage</b>	As last system in a cascade, configurable via host
<b>Connection types</b>	System connection: fixed connection cable 320 mm with plug M12 x 7 + FE, angled

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C46S-0101CT500	1028810	C46E-0101CT500	1028811
300 mm	C46S-0301CT500	1028812	C46E-0301CT500	1028813
450 mm	C46S-0401CT500	1028814	C46E-0401CT500	1028815
600 mm	C46S-0601CT500	1028816	C46E-0601CT500	1028817
750 mm	C46S-0701CT500	1028818	C46E-0701CT500	1028819

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C46S-0103CT500	1028901	C46E-0103CT500	1028902
300 mm	C46S-0303CT500	1028903	C46E-0303CT500	1028904
450 mm	C46S-0403CT500	1028905	C46E-0403CT500	1028906
600 mm	C46S-0603CT500	1028907	C46E-0603CT500	1028908
750 mm	C46S-0703CT500	1028909	C46E-0703CT500	1028910

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## C4000 Standard without extension connection, with pre-configuration C

Based on C4000 Standard	With the following pre-configuration			
	C	D	E	F
Restart interlock	External	External	Internal	Internal
External device monitoring	Selected	Selected	Selected	Selected
Beam coding	Non-coded	Non-coded	Non-coded	Non-coded
Scanning range	Short	Long	Short	Long

- Resolution: 14 mm
- Scanning range: 0 m ... 2.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301CA010	1018591	C40E-0301CC010	1022358
450 mm	C40S-0401CA010	1018347	C40E-0401CC010	1022359
600 mm	C40S-0601CA010	1018593	C40E-0601CC010	1022360
750 mm	C40S-0701CA010	1018595	C40E-0701CC010	1022361
900 mm	C40S-0901CA010	1018597	C40E-0901CC010	1022362
1050 mm	C40S-1001CA010	1018599	C40E-1001CC010	1022363
1200 mm	C40S-1201CA010	1018601	C40E-1201CC010	1022364
1350 mm	C40S-1301CA010	1018603	C40E-1301CC010	1022365
1500 mm	C40S-1501CA010	1018605	C40E-1501CC010	1022366
1650 mm	C40S-1601CA010	1018607	C40E-1601CC010	1022367
1800 mm	C40S-1801CA010	1018609	C40E-1801CC010	1022368

- Resolution: 20 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302CA010	1018613	C40E-0302CC010	1022369
450 mm	C40S-0402CA010	1018615	C40E-0402CC010	1022370
600 mm	C40S-0602CA010	1018617	C40E-0602CC010	1022371
750 mm	C40S-0702CA010	1018619	C40E-0702CC010	1022372
900 mm	C40S-0902CA010	1018621	C40E-0902CC010	1022373
1050 mm	C40S-1002CA010	1018623	C40E-1002CC010	1022374
1200 mm	C40S-1202CA010	1018625	C40E-1202CC010	1022375
1350 mm	C40S-1302CA010	1018627	C40E-1302CC010	1022376
1500 mm	C40S-1502CA010	1018629	C40E-1502CC010	1022377
1650 mm	C40S-1602CA010	1018631	C40E-1602CC010	1022378
1800 mm	C40S-1802CA010	1018633	C40E-1802CC010	1022379

- Resolution: 30 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303CA010	1018635	C40E-0303CC010	1022380
450 mm	C40S-0403CA010	1018637	C40E-0403CC010	1022381
600 mm	C40S-0603CA010	1018639	C40E-0603CC010	1022382
750 mm	C40S-0703CA010	1018641	C40E-0703CC010	1022383
900 mm	C40S-0903CA010	1018643	C40E-0903CC010	1022384
1050 mm	C40S-1003CA010	1018645	C40E-1003CC010	1022385
1200 mm	C40S-1203CA010	1018647	C40E-1203CC010	1022386
1350 mm	C40S-1303CA010	1018649	C40E-1303CC010	1022387
1500 mm	C40S-1503CA010	1018651	C40E-1503CC010	1022388
1650 mm	C40S-1603CA010	1018653	C40E-1603CC010	1022389
1800 mm	C40S-1803CA010	1018655	C40E-1803CC010	1022390

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- Resolution: 40 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0304CA010	1018657	C40E-0304CC010	1022391
450 mm	C40S-0404CA010	1018659	C40E-0404CC010	1022392
600 mm	C40S-0604CA010	1018661	C40E-0604CC010	1022393
750 mm	C40S-0704CA010	1018663	C40E-0704CC010	1022394
900 mm	C40S-0904CA010	1018665	C40E-0904CC010	1022395
1050 mm	C40S-1004CA010	1018667	C40E-1004CC010	1022396
1200 mm	C40S-1204CA010	1018669	C40E-1204CC010	1022397
1350 mm	C40S-1304CA010	1018671	C40E-1304CC010	1022398
1500 mm	C40S-1504CA010	1018673	C40E-1504CC010	1022399
1650 mm	C40S-1604CA010	1018675	C40E-1604CC010	1022400
1800 mm	C40S-1804CA010	1018677	C40E-1804CC010	1022401

## C4000 Standard without extension connection, with pre-configuration D

Based on C4000 Standard	With the following pre-configuration			
	C	D	E	F
Restart interlock	External	External	Internal	Internal
External device monitoring	Selected	Selected	Selected	Selected
Beam coding	Non-coded	Non-coded	Non-coded	Non-coded
Scanning range	Short	Long	Short	Long

- Resolution: 14 mm
- Scanning range: 2 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301CA010	1018591	C40E-0301CD010	1022402
450 mm	C40S-0401CA010	1018347	C40E-0401CD010	1022403
600 mm	C40S-0601CA010	1018593	C40E-0601CD010	1022404
750 mm	C40S-0701CA010	1018595	C40E-0701CD010	1022405
900 mm	C40S-0901CA010	1018597	C40E-0901CD010	1022406
1050 mm	C40S-1001CA010	1018599	C40E-1001CD010	1022407
1200 mm	C40S-1201CA010	1018601	C40E-1201CD010	1022408
1350 mm	C40S-1301CA010	1018603	C40E-1301CD010	1022409
1500 mm	C40S-1501CA010	1018605	C40E-1501CD010	1022410
1650 mm	C40S-1601CA010	1018607	C40E-1601CD010	1022411
1800 mm	C40S-1801CA010	1018609	C40E-1801CD010	1022412

- Resolution: 20 mm
- Scanning range: 5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302CA010	1018613	C40E-0302CD010	1022413
450 mm	C40S-0402CA010	1018615	C40E-0402CD010	1022414
600 mm	C40S-0602CA010	1018617	C40E-0602CD010	1022415
750 mm	C40S-0702CA010	1018619	C40E-0702CD010	1022416
900 mm	C40S-0902CA010	1018621	C40E-0902CD010	1022417
1050 mm	C40S-1002CA010	1018623	C40E-1002CD010	1022418
1200 mm	C40S-1202CA010	1018625	C40E-1202CD010	1022419
1350 mm	C40S-1302CA010	1018627	C40E-1302CD010	1022420
1500 mm	C40S-1502CA010	1018629	C40E-1502CD010	1022421
1650 mm	C40S-1602CA010	1018631	C40E-1602CD010	1022422
1800 mm	C40S-1802CA010	1018633	C40E-1802CD010	1022423

- Resolution: 30 mm
- Scanning range: 5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303CA010	1018635	C40E-0303CD010	1022424
450 mm	C40S-0403CA010	1018637	C40E-0403CD010	1022425
600 mm	C40S-0603CA010	1018639	C40E-0603CD010	1022426
750 mm	C40S-0703CA010	1018641	C40E-0703CD010	1022427
900 mm	C40S-0903CA010	1018643	C40E-0903CD010	1022428
1050 mm	C40S-1003CA010	1018645	C40E-1003CD010	1022429
1200 mm	C40S-1203CA010	1018647	C40E-1203CD010	1022430
1350 mm	C40S-1303CA010	1018649	C40E-1303CD010	1022431
1500 mm	C40S-1503CA010	1018651	C40E-1503CD010	1022432
1650 mm	C40S-1603CA010	1018653	C40E-1603CD010	1022433
1800 mm	C40S-1803CA010	1018655	C40E-1803CD010	1022434

F

- Resolution: 40 mm
- Scanning range: 5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0304CA010	1018657	C40E-0304CD010	1022435
450 mm	C40S-0404CA010	1018659	C40E-0404CD010	1022436
600 mm	C40S-0604CA010	1018661	C40E-0604CD010	1022437
750 mm	C40S-0704CA010	1018663	C40E-0704CD010	1022438
900 mm	C40S-0904CA010	1018665	C40E-0904CD010	1022439
1050 mm	C40S-1004CA010	1018667	C40E-1004CD010	1022440
1200 mm	C40S-1204CA010	1018669	C40E-1204CD010	1022441
1350 mm	C40S-1304CA010	1018671	C40E-1304CD010	1022442
1500 mm	C40S-1504CA010	1018673	C40E-1504CD010	1022443
1650 mm	C40S-1604CA010	1018675	C40E-1604CD010	1022444
1800 mm	C40S-1804CA010	1018677	C40E-1804CD010	1022445

## C4000 Standard without extension connection, with pre-configuration E

Based on C4000 Standard	With the following pre-configuration			
	C	D	E	F
Restart interlock	External	External	Internal	Internal
External device monitoring	Selected	Selected	Selected	Selected
Beam coding	Non-coded	Non-coded	Non-coded	Non-coded
Scanning range	Short	Long	Short	Long

- Resolution: 14 mm
- Scanning range: 0 m ... 2.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301CA010	1018591	C40E-0301CE010	1022446
450 mm	C40S-0401CA010	1018347	C40E-0401CE010	1022447
600 mm	C40S-0601CA010	1018593	C40E-0601CE010	1022448
750 mm	C40S-0701CA010	1018595	C40E-0701CE010	1022449
900 mm	C40S-0901CA010	1018597	C40E-0901CE010	1022450
1050 mm	C40S-1001CA010	1018599	C40E-1001CE010	1022451
1200 mm	C40S-1201CA010	1018601	C40E-1201CE010	1022452
1350 mm	C40S-1301CA010	1018603	C40E-1301CE010	1022453
1500 mm	C40S-1501CA010	1018605	C40E-1501CE010	1022454
1650 mm	C40S-1601CA010	1018607	C40E-1601CE010	1022455
1800 mm	C40S-1801CA010	1018609	C40E-1801CE010	1022456

- Resolution: 20 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302CA010	1018613	C40E-0302CE010	1022457
450 mm	C40S-0402CA010	1018615	C40E-0402CE010	1022458
600 mm	C40S-0602CA010	1018617	C40E-0602CE010	1022459
750 mm	C40S-0702CA010	1018619	C40E-0702CE010	1022460
900 mm	C40S-0902CA010	1018621	C40E-0902CE010	1022461
1050 mm	C40S-1002CA010	1018623	C40E-1002CE010	1022462
1200 mm	C40S-1202CA010	1018625	C40E-1202CE010	1022463
1350 mm	C40S-1302CA010	1018627	C40E-1302CE010	1022464
1500 mm	C40S-1502CA010	1018629	C40E-1502CE010	1022465
1650 mm	C40S-1602CA010	1018631	C40E-1602CE010	1022466
1800 mm	C40S-1802CA010	1018633	C40E-1802CE010	1022467

- Resolution: 30 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303CA010	1018635	C40E-0303CE010	1022468
450 mm	C40S-0403CA010	1018637	C40E-0403CE010	1022469
600 mm	C40S-0603CA010	1018639	C40E-0603CE010	1022470
750 mm	C40S-0703CA010	1018641	C40E-0703CE010	1022471
900 mm	C40S-0903CA010	1018643	C40E-0903CE010	1022472
1050 mm	C40S-1003CA010	1018645	C40E-1003CE010	1022473
1200 mm	C40S-1203CA010	1018647	C40E-1203CE010	1022474
1350 mm	C40S-1303CA010	1018649	C40E-1303CE010	1022475
1500 mm	C40S-1503CA010	1018651	C40E-1503CE010	1022476
1650 mm	C40S-1603CA010	1018653	C40E-1603CE010	1022477
1800 mm	C40S-1803CA010	1018655	C40E-1803CE010	1022478

F

- Resolution: 40 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0304CA010	1018657	C40E-0304CE010	1022479
450 mm	C40S-0404CA010	1018659	C40E-0404CE010	1022480
600 mm	C40S-0604CA010	1018661	C40E-0604CE010	1022481
750 mm	C40S-0704CA010	1018663	C40E-0704CE010	1022482
900 mm	C40S-0904CA010	1018665	C40E-0904CE010	1022483
1050 mm	C40S-1004CA010	1018667	C40E-1004CE010	1022484
1200 mm	C40S-1204CA010	1018669	C40E-1204CE010	1022485
1350 mm	C40S-1304CA010	1018671	C40E-1304CE010	1022486
1500 mm	C40S-1504CA010	1018673	C40E-1504CE010	1022487
1650 mm	C40S-1604CA010	1018675	C40E-1604CE010	1022488
1800 mm	C40S-1804CA010	1018677	C40E-1804CE010	1022489



## C4000 Standard without extension connection, with pre-configuration F

Based on C4000 Standard	With the following pre-configuration			
	C	D	E	F
Restart interlock	External	External	Internal	Internal
External device monitoring	Selected	Selected	Selected	Selected
Beam coding	Non-coded	Non-coded	Non-coded	Non-coded
Scanning range	Short	Long	Short	Long

- Resolution: 14 mm
- Scanning range: 2 m ... 8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301CA010	1018591	C40E-0301CF010	1022490
450 mm	C40S-0401CA010	1018347	C40E-0401CF010	1022491
600 mm	C40S-0601CA010	1018593	C40E-0601CF010	1022492
750 mm	C40S-0701CA010	1018595	C40E-0701CF010	1022493
900 mm	C40S-0901CA010	1018597	C40E-0901CF010	1022494
1050 mm	C40S-1001CA010	1018599	C40E-1001CF010	1022495
1200 mm	C40S-1201CA010	1018601	C40E-1201CF010	1022496
1350 mm	C40S-1301CA010	1018603	C40E-1301CF010	1022497
1500 mm	C40S-1501CA010	1018605	C40E-1501CF010	1022498
1650 mm	C40S-1601CA010	1018607	C40E-1601CF010	1022499
1800 mm	C40S-1801CA010	1018609	C40E-1801CF010	1022500

- Resolution: 20 mm
- Scanning range: 5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302CA010	1018613	C40E-0302CF010	1022501
450 mm	C40S-0402CA010	1018615	C40E-0402CF010	1022502
600 mm	C40S-0602CA010	1018617	C40E-0602CF010	1022503
750 mm	C40S-0702CA010	1018619	C40E-0702CF010	1022504
900 mm	C40S-0902CA010	1018621	C40E-0902CF010	1022505
1050 mm	C40S-1002CA010	1018623	C40E-1002CF010	1022506
1200 mm	C40S-1202CA010	1018625	C40E-1202CF010	1022507
1350 mm	C40S-1302CA010	1018627	C40E-1302CF010	1022508
1500 mm	C40S-1502CA010	1018629	C40E-1502CF010	1022509
1650 mm	C40S-1602CA010	1018631	C40E-1602CF010	1022510
1800 mm	C40S-1802CA010	1018633	C40E-1802CF010	1022511

- Resolution: 30 mm
- Scanning range: 5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303CA010	1018635	C40E-0303CF010	1022512
450 mm	C40S-0403CA010	1018637	C40E-0403CF010	1022513
600 mm	C40S-0603CA010	1018639	C40E-0603CF010	1022514
750 mm	C40S-0703CA010	1018641	C40E-0703CF010	1022515
900 mm	C40S-0903CA010	1018643	C40E-0903CF010	1022516
1050 mm	C40S-1003CA010	1018645	C40E-1003CF010	1022517
1200 mm	C40S-1203CA010	1018647	C40E-1203CF010	1022518
1350 mm	C40S-1303CA010	1018649	C40E-1303CF010	1022519
1500 mm	C40S-1503CA010	1018651	C40E-1503CF010	1022520
1650 mm	C40S-1603CA010	1018653	C40E-1603CF010	1022521
1800 mm	C40S-1803CA010	1018655	C40E-1803CF010	1022522

## F

- Resolution: 40 mm
- Scanning range: 5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0304CA010	1018657	C40E-0304CF010	1022523
450 mm	C40S-0404CA010	1018659	C40E-0404CF010	1022524
600 mm	C40S-0604CA010	1018661	C40E-0604CF010	1022525
750 mm	C40S-0704CA010	1018663	C40E-0704CF010	1022526
900 mm	C40S-0904CA010	1018665	C40E-0904CF010	1022527
1050 mm	C40S-1004CA010	1018667	C40E-1004CF010	1022528
1200 mm	C40S-1204CA010	1018669	C40E-1204CF010	1022529
1350 mm	C40S-1304CA010	1018671	C40E-1304CF010	1022530
1500 mm	C40S-1504CA010	1018673	C40E-1504CF010	1022531
1650 mm	C40S-1604CA010	1018675	C40E-1604CF010	1022532
1800 mm	C40S-1804CA010	1018677	C40E-1804CF010	1022533

## UE402 switching amplifier

Description	Type	Part no.
Expands C4000 Standard, Advanced, Palletizer, Entry/Exit and Fusion with the functions described in the technical data, e.g., bypass, operating mode switching or in addition PSDI mode on C4000 Standard, Advanced.	UE402	1023577

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### C4000 Standard

#### General data

	Sender	Receiver
Resolution (depending on type)	14 mm ... 40 mm	
Scanning range (depending on type)	-	0 m ... 8 m / 0 m ... 19 m
Protective field height (depending on type)	300 mm ... 1800 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 26 ms <sup>1)</sup>
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

<sup>1)</sup> Without beam coding, without blanking, no cascaded systems. Other response times, see operating instructions.

#### Functional data

System part	Sender	Receiver
Restart interlock	-	✓
Restart interlock (delivery status)	-	External
External device monitoring	-	✓
External device monitoring (delivery status)	-	Deactivated
Beam coding	✓	
Beam coding (delivery status)	Non-coded	
Reduced resolution (depending on type)	- / ✓	-
Extension connection (depending on type)	- / ✓	
Emergency stop / bypass at extension connection (depending on type)	-	- / ✓
Bypass (with UE402)	-	✓
Operating mode switching (with UE402)	-	✓
PSDI mode (with UE402)	✓	
Safe device communication via EFI/SDL	✓	
Configuration method	PC with CDS (configuration and diagnostic software)	

## Electrical data

System part	Sender	Receiver
System connection	Hirschmann plug M26 x 11 + FE	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Extension connection (depending on type)	Hirschmann socket M26 x 11 + FE / socket M12 x 7 + FE	
Connection cable wire cross-section	M26 x 11 + FE	0.75 mm <sup>2</sup>
	M12 x 7 + FE	0.25 mm <sup>2</sup>
Configuration connection	M8 x 4	
Supply voltage V <sub>S</sub>	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 10 % <sup>3)</sup>	
Power consumption	Max. 2 A	Max. 3 A
Safety outputs (OSSD)	Type of output	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
	Switching voltage HIGH	24 V DC (V <sub>S</sub> - 2.25 V DC ... V <sub>S</sub> )
	Switching voltage LOW	2 V DC
	Switching current	Max. 500 mA
Display elements	7-segment	

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of V<sub>S</sub>.

## C4000 Standard Guest

## General data

	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Scanning range (depending on type)	-	0 m ... 8 m / 0 m ... 19 m
Protective field height (depending on type)	150 mm ... 1800 mm	
Safety related parameters	Type	Type 4 (IEC 61496)
	Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)
	Category	Category 4 (EN ISO 13849)
	Performance level	PL e (EN ISO 13849)
	PFHd (mean probability of a dangerous failure per hour)	1.5 x 10 <sup>-8</sup> (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 26 ms <sup>1)</sup>
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

<sup>1)</sup> Without beam coding, without blanking. Other response times, see operating instructions.

## Functional data

System part	Sender	Receiver
Beam coding		✓
Beam coding (delivery status)	Non-coded	
PSDI mode (with UE402)		✓
Configuration method	PC with CDS (configuration and diagnostic software)	

## Electrical data

System part	Sender	Receiver
System connection (depending on type)	Fixed connection cable 320 mm with plug M12 x 7 + FE, straight Fixed connection cable 320 mm with plug M12 x 7 + FE, angled	
Connecting cable length	Max. 3 m <sup>1)</sup>	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	$\leq 10\%$ <sup>3)</sup>	
Power consumption	Max. 2 A	Max. 3 A
Safety outputs (OSSD)		2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Type of output	-	24 V DC ( $V_S - 2.25$ V DC ... $V_S$ )
Switching voltage HIGH	-	2 V DC
Switching voltage LOW	-	Max. 500 mA
Switching current	-	
Display elements	7-segment	

<sup>1)</sup> Between host and guest

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of  $V_S$ .

## UE402 switching amplifier

## General data

Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$15 \times 10^{-9}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Protection class	III (IEC 536:1976)	
Enclosure rating	IP 20 (IEC 60529)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Storage temperature from ... to	-25 °C ... +70 °C	
Weight	120 g	
Housing material	Plastic	

## Functional data

PSDI mode	✓
Bypass	✓
Operating mode switching	✓

**Electrical data**

Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC)
Residual ripple	$\leq 10 \%$
Power consumption	Max. 110 mA
Switch-on time	Max. 4 s
IN A1 ... A6, MCC-BDC, MCC-TDC	
Switching voltage HIGH	24 V DC (11 V DC ... 30 V DC)
Switching voltage LOW	-30 V DC ... 5 V DC
Switching current HIGH	6 mA ... 20 mA
Switching current LOW	-3 mA ... 0.5 mA
Change over time operating mode selection	Max. 2 s
IN B1, IN B2, OUT B1, OUT B2	
Change over time bypass	Max. 2 s
Synchronous time monitoring	200 ms

**Safety outputs**

Connection type	Screw-terminal connector
Conductor cross-section	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

**F**

# Dimensional drawings

## C4000 Standard without extension connection

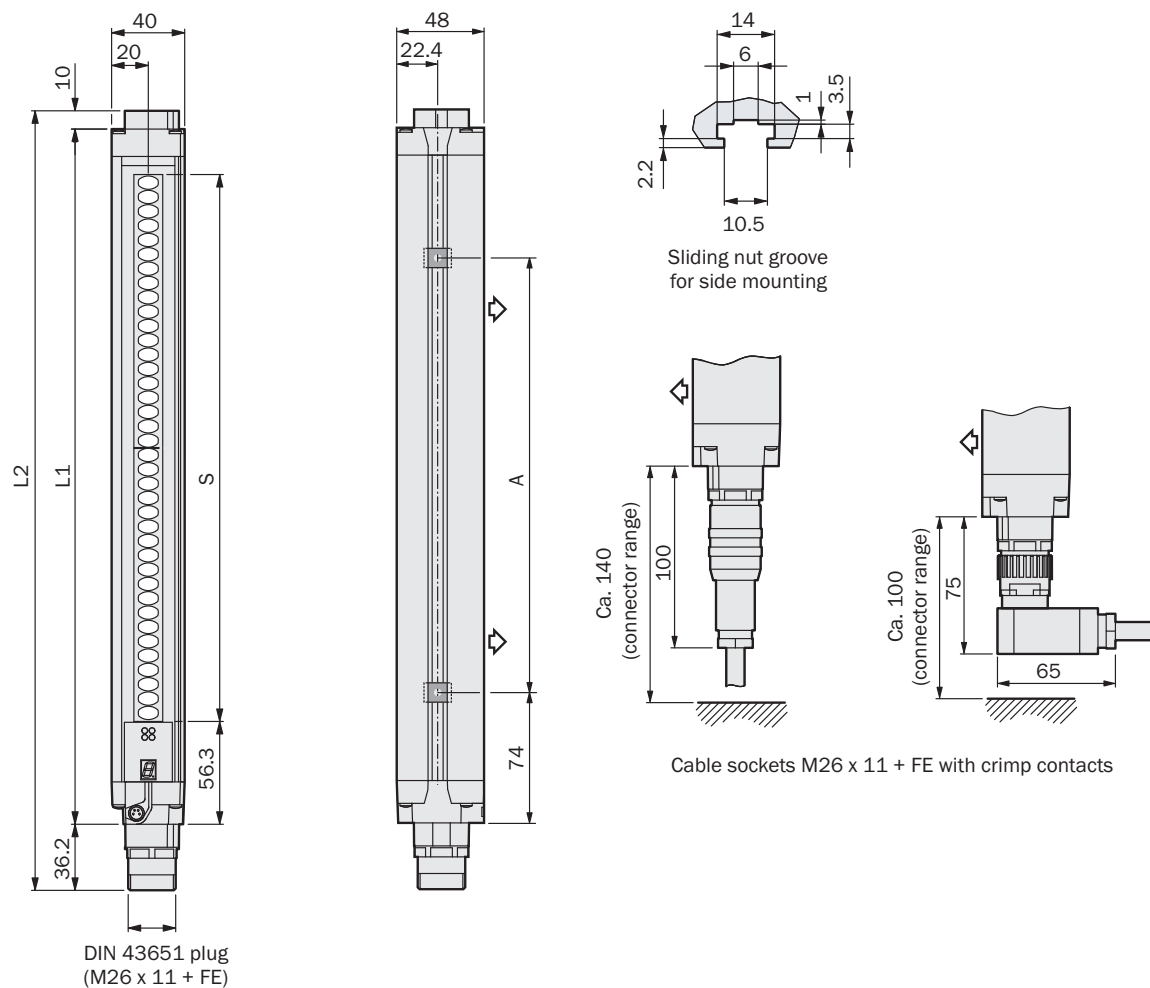


Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	381	427	224
450	532	578	374
600	682	728	524
750	833	879	674
900	984	1030	824
1050	1134	1180	974
1200	1283	1329	1124
1350	1435	1481	1274
1500	1586	1632	1424
1650	1736	1782	1574
1800	1887	1933	1724

Dimensions in mm

**C4000 Standard with angled system connection, without extension connection**

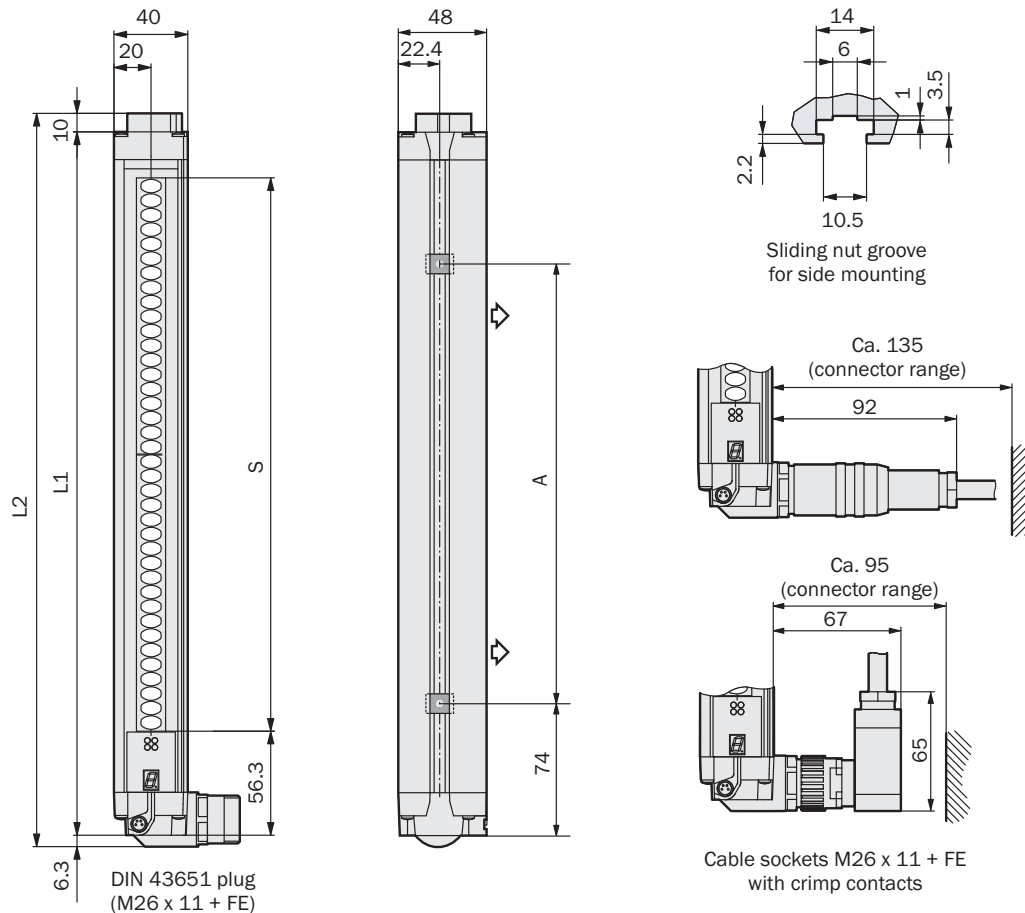


Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	381	427	224
450	532	578	374
600	682	728	524
750	833	879	674
900	984	1030	824
1050	1134	1180	974
1200	1283	1329	1124
1350	1435	1481	1274
1500	1586	1632	1424
1650	1736	1782	1574
1800	1887	1933	1724

Dimensions in mm





**C4000 Standard with extension connection M26 x 11 + FE**

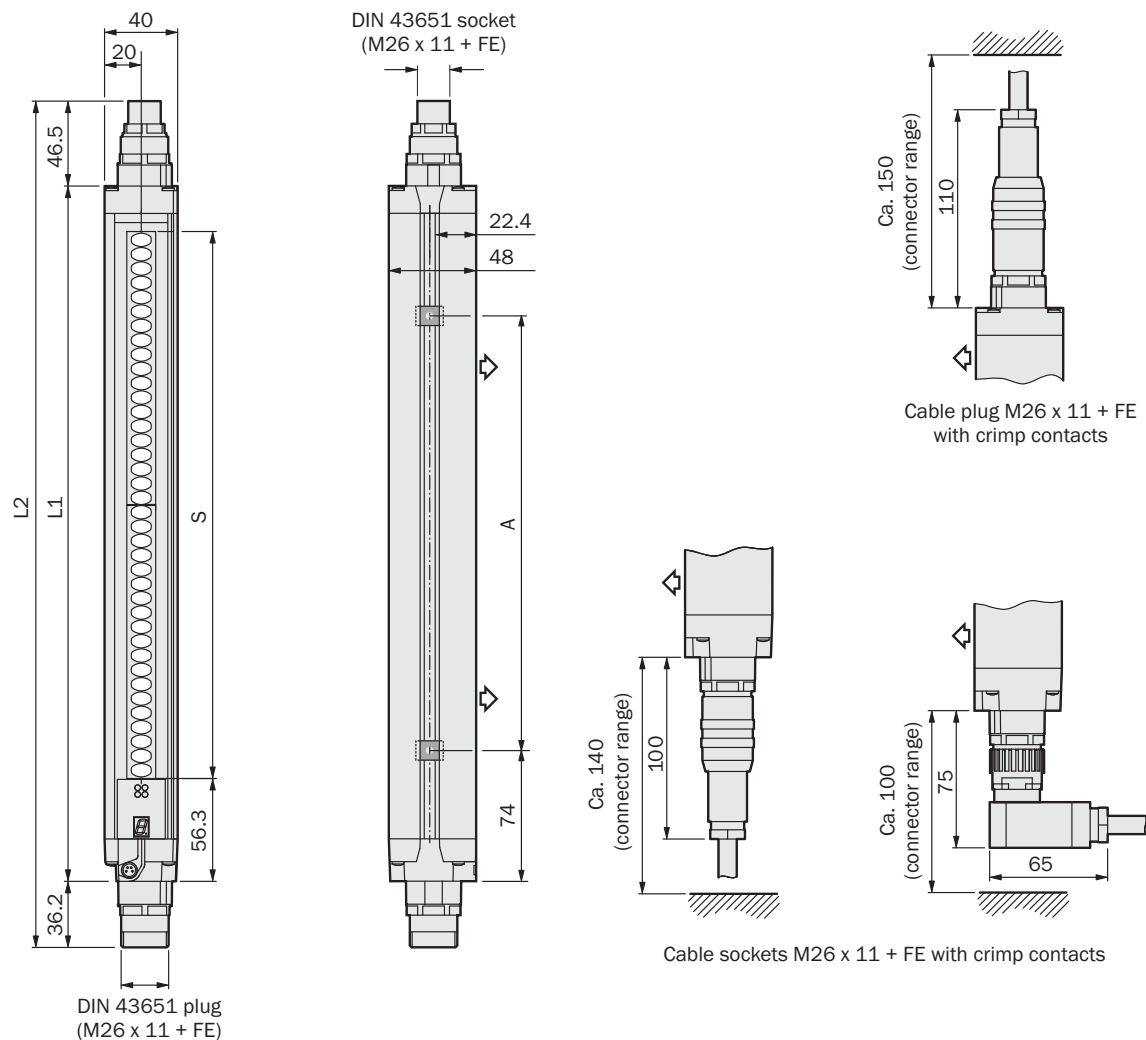


Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	381	464	224
450	532	614	374
600	682	765	524
750	833	915	674
900	984	1066	824
1050	1134	1216	974
1200	1283	1366	1124
1350	1435	1517	1274
1500	1586	1669	1424
1650	1736	1818	1574
1800	1887	1969	1724

Dimensions in mm

C4000 Standard with extension connection M12 x 7 + FE

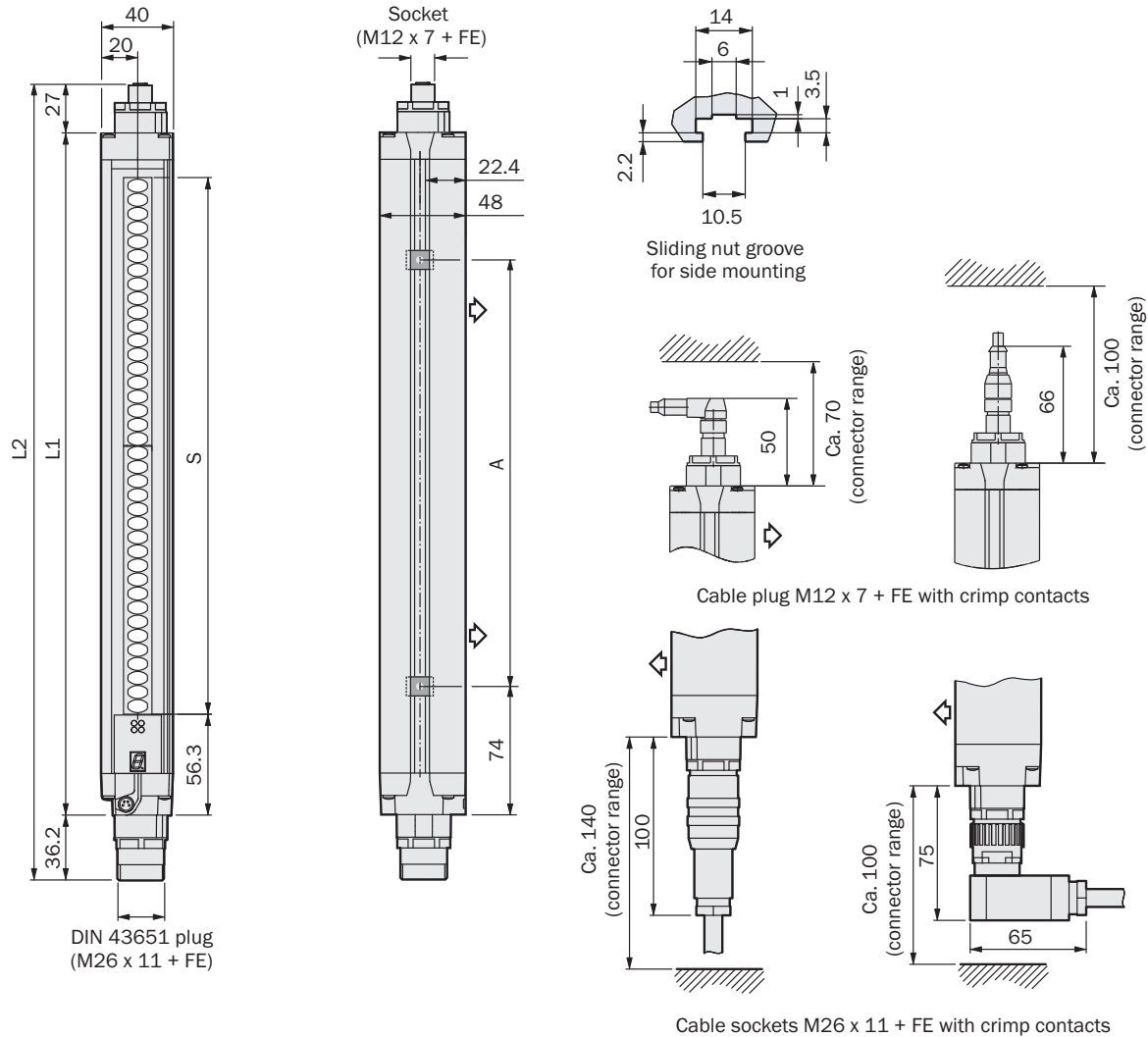


Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	381	444	224
450	532	594	374
600	682	744	524
750	833	895	674
900	984	1046	824
1050	1134	1196	974
1200	1283	1346	1124
1350	1435	1497	1274
1500	1586	1649	1424
1650	1736	1798	1574
1800	1887	1949	1724

Dimensions in mm



**C4000 Standard Guest with straight system connection**

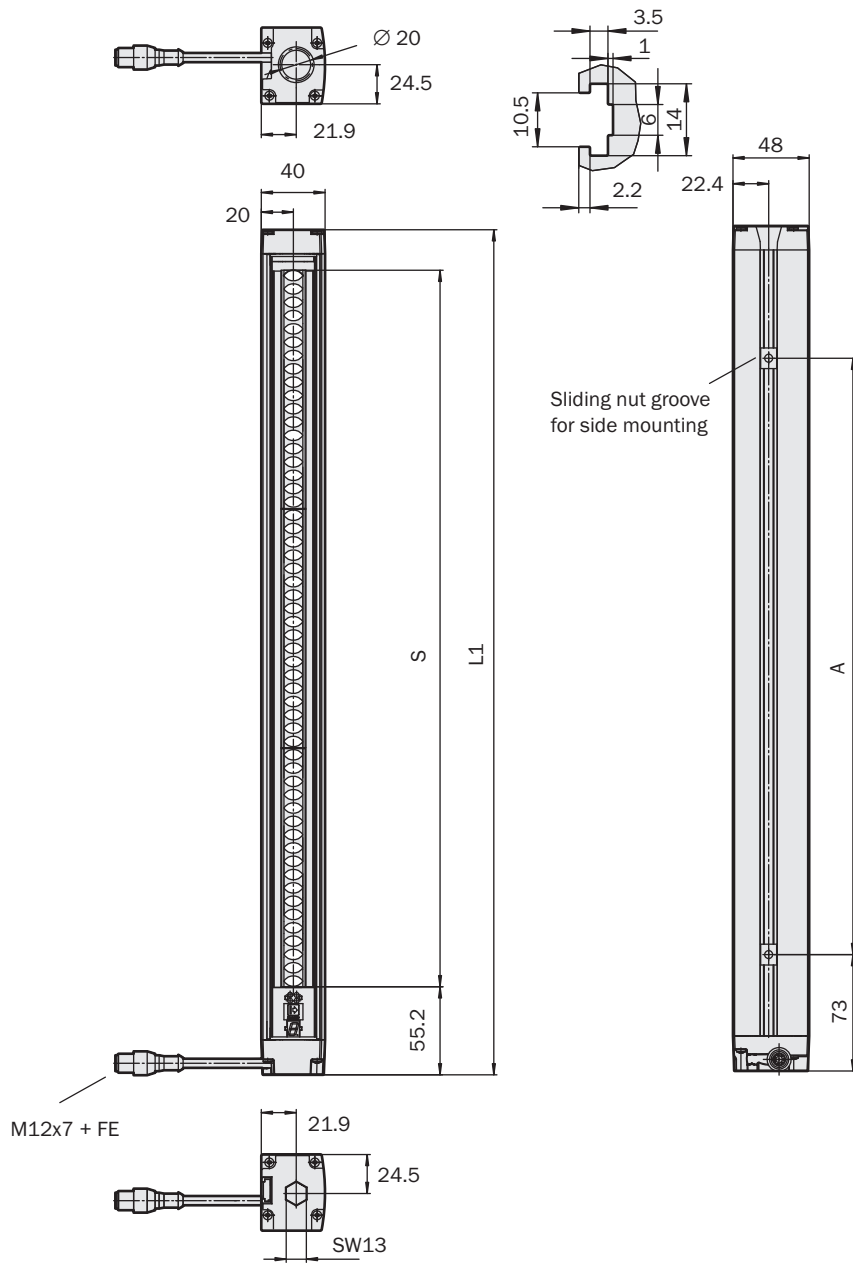


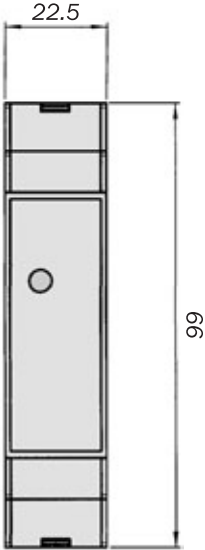
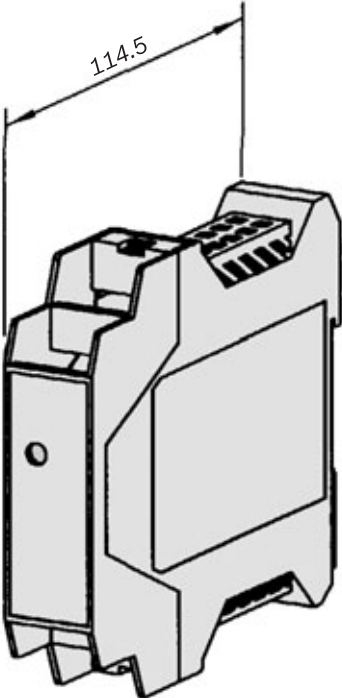
Illustration sender (receiver mirror image)

Protective field height S	L1	A
150	220	76
300	380	224
450	530	374
600	680	524
750	830	674
900	981	825
1050	1131	975
1200	1281	1125
1350	1432	1275
1500	1583	1427
1650	1733	1504
1800	1884	1728

Dimensions in mm

UE402 switching amplifier

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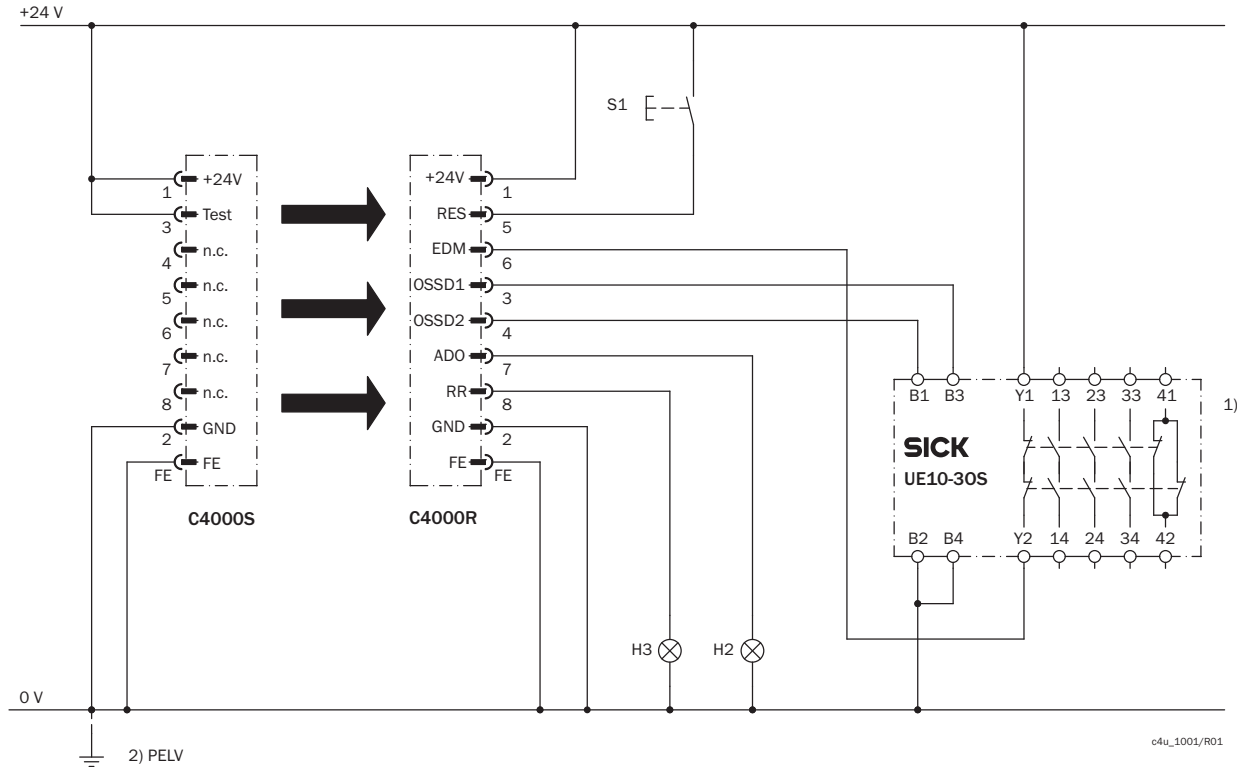


Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### C4000 Standard on UE10-30S safety relay



#### Task

Connection of a C4000 Standard/Advanced/Palletizer/Fusion safety light curtain to UE10-30S. Operating mode: with restart interlock and external device monitoring.

#### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the yellow LED on the receiver and the H3 lamp flash. The system is ready to be switched on. The system is enabled by pressing S1 (button is pressed and released). The OSSD1 and OSSD2 outputs are live and the UE10-30S is switched on. Upon the interruption of one of the light beams, the UE10-30S is deactivated by the OSSD1 and OSSD2 outputs.

#### Fault analysis

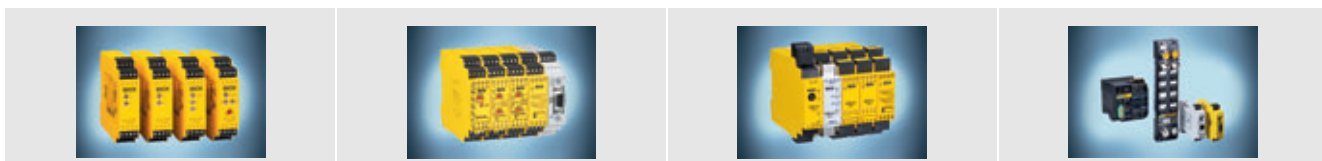
OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The incorrect functioning of the

UE10-30S will be detected but will not result in the loss of the shutdown function. Jamming of the S1 button prevents the output circuit from enabling H2 lamp is illuminated if there is contamination (adjustable parameter).

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
- 2) PELV in accordance with the requirements in EN 60204-1 / 6.4 Take note of the operating instructions of the integrated devices.

## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847
	Mounting kit C4000 Guest, swivel mount	4	BEF-2WNAEEST4	2034959
	Mounting kit 11, replacement bracket, suitable for replacement of FGS	4	BEF-3WNGBCST4	2021646


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600



### Connecting cables

Figure	Cable length	Remark	Type	Part no.
	By the meter	Fitting for EFI connections	Connection cable	6021437

**Connecting cables (cont'd)**



Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	DOL-0612G2M5075KM0	2022544
			5 m	DOL-0612G05M075KM0	2022545
			7.5 m	DOL-0612G7M5075KM0	2022546
			10 m	DOL-0612G10M075KM0	2022547
			15 m	DOL-0612G15M075KM0	2022548
			20 m	DOL-0612G20M075KM0	2022549
			30 m	DOL-0612G30M075KM0	2022550
			50 m	DOL-0612G50MD75KM0	2033548

**Connectors**



Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable plug M26 x 11 + FE	Straight	STE-0612G000GA3KM0	6021191
		Angled	STE-0612W000GA3KM0	6021192

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**Cable receptacles**

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758


**Cascade connection cables**

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann M26 x 11 + FE	Plug straight/ socket straight	0.25 m	DSL-0612GM25075KM0	2022278
			0.5 m	DSL-0612G0M5075KM0	2021838
			1 m	DSL-0612G01M075KM0	2022279
			1.5 m	DSL-0612G1M5075KM0	2022280
			2 m	DSL-0612G02M075KM0	2022281
			2.5 m	DSL-0612G2M5075KM0	2022282
			3 m	DSL-0612G03M075KM0	2022283
		Plug straight/ socket angled	0.25 m	DSL-0612BM25075KM0	2022284
			0.5 m	DSL-0612B0M5075KM0	2022285
			1 m	DSL-0612B01M075KM0	2022286
			1.5 m	DSL-0612B1M5075KM0	2022287
			2 m	DSL-0612B02M075KM0	2022288
			2.5 m	DSL-0612B2M5075KM0	2022289
			3 m	DSL-0612B03M075KM0	2022290
	M12 x 8	Plug straight/ socket straight	1 m	DSL-127SG01ME25KM0	6021002
		Plug angled/ socket straight	1 m	DSL-127SA01ME25KM0	6030974

**Control switch connection cables**

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann M26 x 7 + FE	Plug straight	2.5 m	STL-0608G2M5075KM1	2026869
			10 m	STL-0608G10M075KM1	2026870


**Configuration connection cables**

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649


**Terminators**

Description	Remark	Type	Part no.
Terminal with 182 Ω resistance for pin 9 and 10 on the system connection	For improving the EMC behavior if EFI device communication is not used	Terminal with 182 Ω resistance	2027227

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

**Device columns with external grooves**

Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

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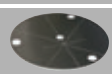





## Mirror columns with protective field height mirror

Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0

## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Additional front screens

Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2022412
	450 mm	2022413
	600 mm	2022414
	750 mm	2022415
	900 mm	2022416
	1050 mm	2022417
	1200 mm	2022418
	1350 mm	2022419
	1500 mm	2022420
	1650 mm	2022421
	1800 mm	2022422

**Additional heavy-duty front screens**


Figure	Suitable for protective field height	Part no.
 <p>Example of use</p>	300 mm	2026853
	450 mm	2026854
	600 mm	2026855
	750 mm	2026856
	900 mm	2026857
	1050 mm	2026858
	1200 mm	2026859
	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863

**Deflector mirrors PNS75**




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Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
		1800 mm	PNS75-184	1019424

**Deflector mirrors PNS125**

Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435



**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731


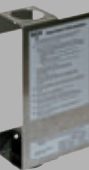
**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Configuration tools**

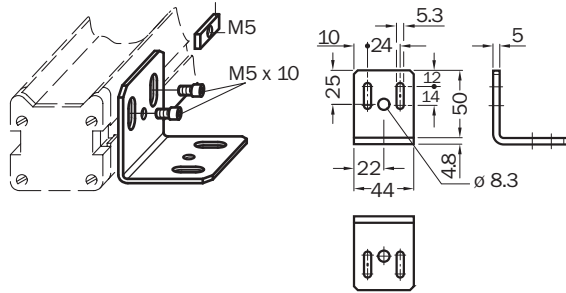
Figure	Description	Type	Part no.
	For saving and transferring configurations. For C4000 Standard, Advanced, Palletizer, Entry/Exit, Fusion and M4000 Advanced, Advanced Curtain, Area	Clone Plug for C4000 and M4000	1029665
	For resetting a system position saved in a C4000 (host, guest 1, guest 2). For C4000 Standard, Advanced, Palletizer, Entry/Exit	Host-Guest Plug for C4000	1029717
	-	Wall mount	5318443

**Device protection**

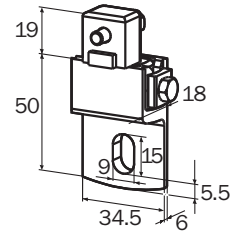
Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	20 mm diameter	Test rod	2022600
	30 mm diameter	Test rod	2022602
	40 mm diameter	Test rod	2022604
	Test rod holder	BEF-3WNAAAAL1	2052249

Dimensional drawings mounting systems

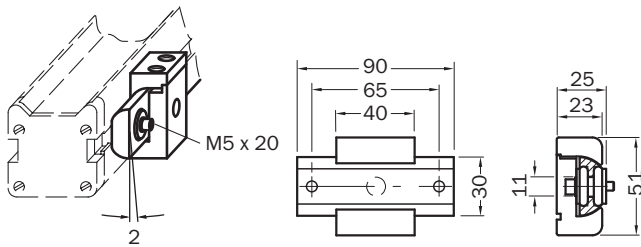
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



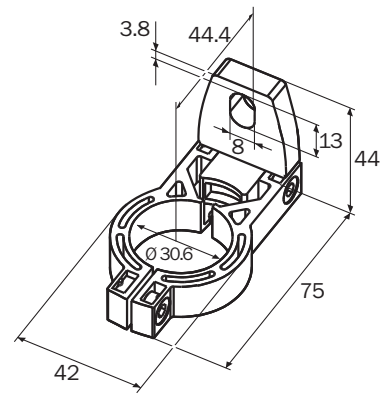
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



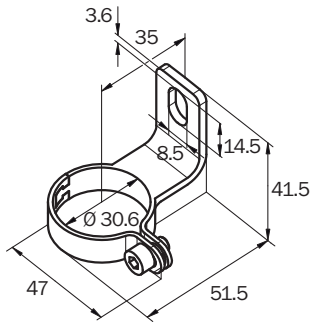
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



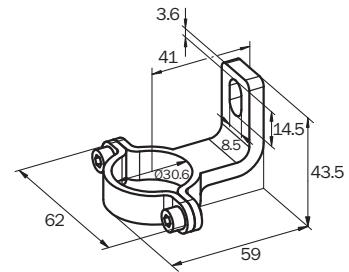
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



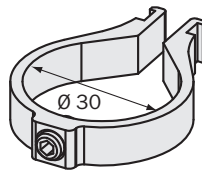
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



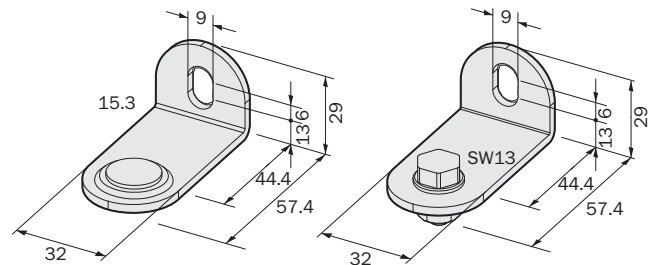
**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2SMMEAL4, BEF-2SMMEAL2**  
Omega bracket, flexible and quick installation with only one screw



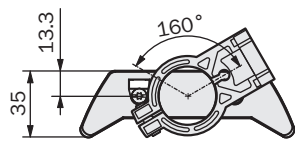
**BEF-2WNAEEST4**  
Mounting kit C4000 Guest, swivel mount



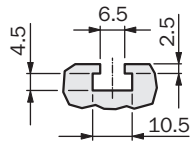
Dimensions in mm

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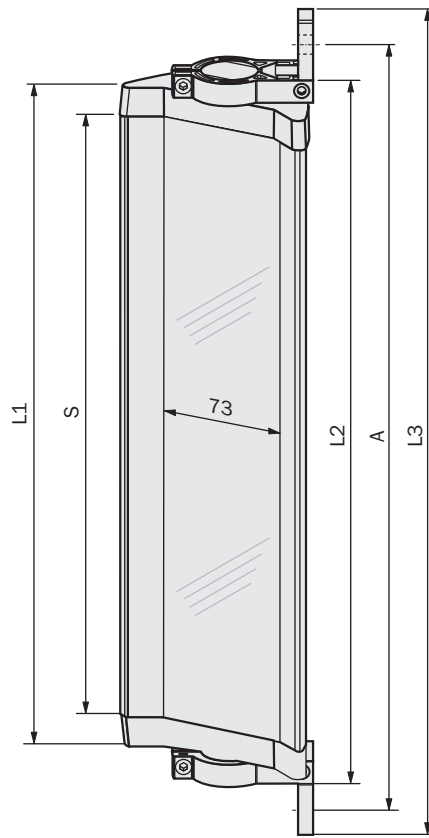
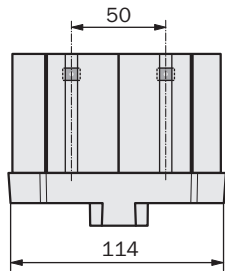
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

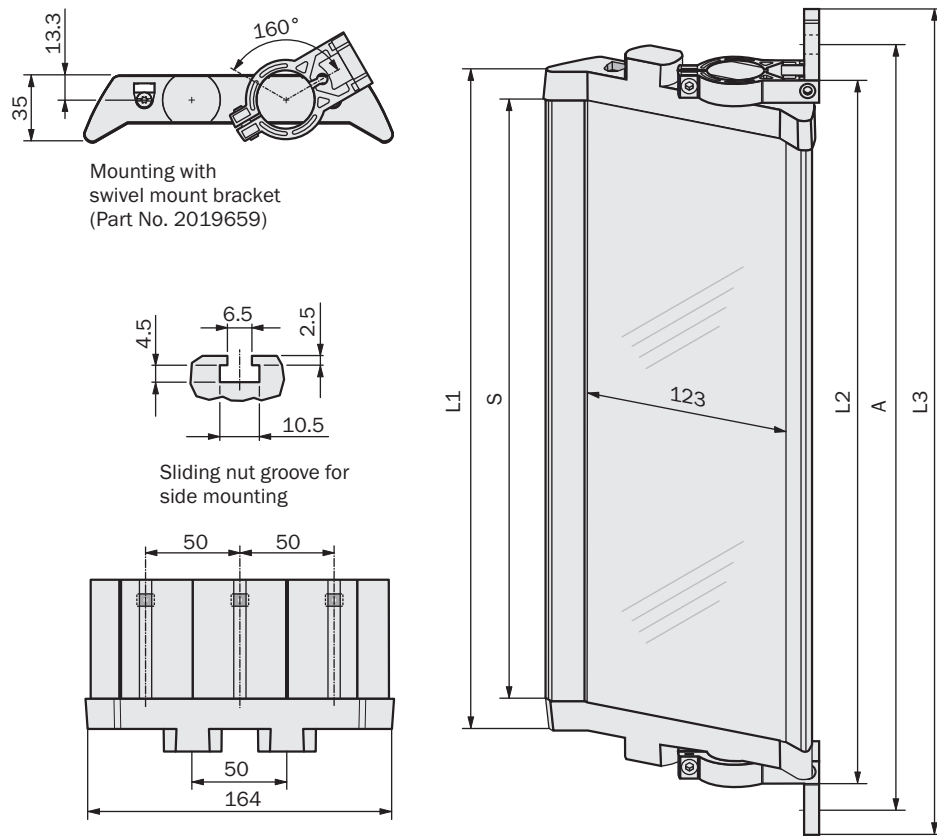


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

## Technical data overview

**Note:** The products of the C4000 ATEX II 3G/3D family are based on products of the C4000 Standard, Advanced, Entry/Exit, Palletizer and Fusion family.  
For explosion-proof applications outside the European Union, other local regulations may apply.

Protective field height (depending on type)	300 mm ... 1800 mm
Scanning range (depending on type)	0 m ... 19 m
Resolution (depending on type)	20 mm / 30 mm / 40 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)
ATEX category	3G (EN 60079-0, EN 60079-15, EN 60079-28) 3D (EN 61241-0, EN 61241-1)
Enclosure rating	IP 65

## Product description

The C4000 ATEX II 3G/3D safety light curtain can be used in explosive areas, zone 2 and 22.

In addition to the features of the basic C4000 family, the C4000 ATEX II 3G/3D provides the following advantages:

- No mechanical adjustments required
- Customer-friendly pre-configuration:
  - Protective cap mounted on terminal compartment
  - ATEX label on the device
  - Modified type label

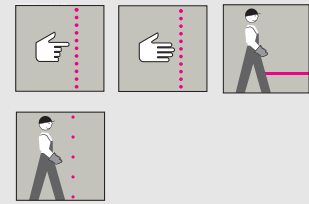
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Automotive industry
- Paint shops
- Wood industry
- Packaging industry / pallets



Paint line in the automotive industry



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- ATEX category 3G (gas) and 3D (dust)
- Beam coding
- External device monitoring (EDM)
- Restart interlock (RES)



Further information	Page
→ Ordering information	F-66
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

**Note:** Other resolutions and protective field heights available upon request.  
C4000 ATEX II 3G/3D based on C4000 Entry/Exit, Palletizer or Fusion are also available upon request.  
For explosion-proof applications outside the European Union, other local regulations may apply.

### C4000 ATEX II 3G/3D based on C4000 Standard

→ For more data on C4000 Standard, see page F-29

<b>Usage</b>	As a standalone system
<b>Connection types</b>	System connection: Hirschmann plug M26 x 11 + FE, straight Configuration connection: M8 x 4

- Resolution: 20 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
900 mm	C40S-S126	1051570	C40E-S126	1051571
1200 mm	C40S-S117	1050714	C40E-S117	1050715

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
750 mm	C40S-S111	1025786	C40E-S111	1025787
900 mm	C40S-S114	1050298	C40E-S114	1050299
1050 mm	C40S-S118	1050716	C40E-S118	1050717
1350 mm	C40S-S115	1050300	C40E-S115	1050301
1500 mm	C40S-S005	1024072	C40E-S005	1024073
1650 mm	C40S-S123	1050747	C40E-S123	1050748
1800 mm	C40S-S124	1051138	C40E-S124	1051139

- Resolution: 40 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-S127	1052310	C40E-S127	1052311
600 mm	C40S-S119	1050718	C40E-S119	1050719
750 mm	C40S-S120	1050720	C40E-S120	1050721
900 mm	C40S-S121	1050722	C40E-S121	1050723
1050 mm	C40S-S122	1050724	C40E-S122	1050725
1350 mm	C40S-S125	1051372	C40E-S125	1051371
1500 mm	C40S-S113	1042292	C40E-S113	1042293
1800 mm	C40S-S110	1024052	C40E-S110	1024053



## C4000 ATEX II 3G/3D based on C4000 Advanced

→ For more data on C4000 Advanced, see page F-2

Usage	As a standalone system
Connection types	System connection: Hirschmann plug M26 x 11 + FE, straight Configuration connection: M8 x 4

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
900 mm	C40S-S114	1050298	C40E-S116	1050537

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- 14/30 mm resolution
- 300 to 1800 mm protective field height
- Restart interlock (RES)
- External device monitoring (EDM)
- Beam coding
- LED/7-segment display
- Application diagnostic output (ADO)
- Configuration and diagnostics via PC
- SDL interface
- Muting configurable in conjunction with UE403
- End cap with integrated LED (optional)



## Technical data overview

Scanning range (depending on type)	0 m ... 8 m / 0 m ... 19 m
Protective field height (depending on type)	300 mm ... 1800 mm
Resolution (depending on type)	14 mm / 30 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The M4000 Advanced Curtain and the UE403 switching amplifier form the efficient solution for decentralized conventional muting applications involving automatic material transport that require high resolution (14/30 mm) due to a short safety distance. Access protection with muting can be achieved with maximum availability, thanks to their integrated functions, easily configured by PC via the RS-232 interface, and the simple in-situ connection of muting signals and control switches to the UE403.

The integrated functions and status and diagnostic information permit rapid commissioning and prevent unnecessary machine downtime.

The modular concept provides a high level of machine safety that takes economic efficiency into account since device properties can be adapted to meet specific requirements.

The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

- Combined with safe control solutions by SICK
- Safe integration in network solutions
- M4000 Advanced Curtain with UE403 for the connection of:
  - 2 to 4 muting sensors
  - External muting lamp
  - Reset and override control switch
  - Conveyor belt stop signal
- Additional functions:
  - Concurrence monitoring
  - Total muting time monitoring
  - Sensor gap monitoring
  - Sensor test
  - Partial blanking
  - End of muting by ESPE
  - Integrated override
- Alternative to UE403: use of e.g., UE4155

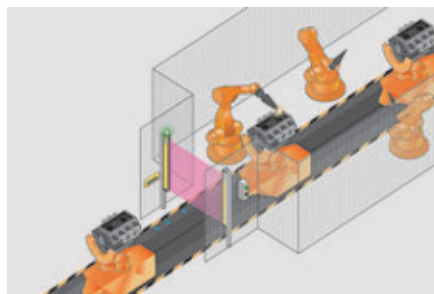
→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

Provides access protection with or without muting on robot systems, machining centers in mechanical engineering applica-

tions, automated conveying storage and transport systems.



Access protection with muting on a motor machining station

Further information	Page
→ Technical specifications	F-71
→ Dimensional drawings	F-75
→ Connection diagrams	F-77
→ Accessories	F-78
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### Resolution 14 mm

Protective field height	End cap with integrated LED	Sender		Receiver	
		Type	Part no.	Type	Part no.
300 mm	-	M40S-60A503AA0	1203262	M40E-60A503RB0	1203263
	✓	M40S-60A503AA0	1203262	M40E-60A523RB0	1205622
450 mm	-	M40S-61A503AA0	1203264	M40E-61A503RB0	1203265
	✓	M40S-61A503AA0	1203264	M40E-61A523RB0	1205623
600 mm	-	M40S-62A503AA0	1203266	M40E-62A503RB0	1203267
	✓	M40S-62A503AA0	1203266	M40E-62A523RB0	1205625
750 mm	-	M40S-63A503AA0	1203240	M40E-63A503RB0	1203241
	✓	M40S-63A503AA0	1203240	M40E-63A523RB0	1205303
900 mm	-	M40S-64A503AA0	1203268	M40E-64A503RB0	1203269
	✓	M40S-64A503AA0	1203268	M40E-64A523RB0	1205626
1050 mm	-	M40S-65A503AA0	1203270	M40E-65A503RB0	1203271
	✓	M40S-65A503AA0	1203270	M40E-65A523RB0	1205627
1200 mm	-	M40S-66A503AA0	1203272	M40E-66A503RB0	1203273
	✓	M40S-66A503AA0	1203272	M40E-66A523RB0	1204827
1350 mm	-	M40S-67A503AA0	1203274	M40E-67A503RB0	1203275
	✓	M40S-67A503AA0	1203274	M40E-67A523RB0	1205628
1500 mm	-	M40S-68A503AA0	1203276	M40E-68A503RB0	1203277
	✓	M40S-68A503AA0	1203276	M40E-68A523RB0	1203511
1650 mm	-	M40S-69A503AA0	1203278	M40E-69A503RB0	1203279
	✓	M40S-69A503AA0	1203278	M40E-69A523RB0	1205629
1800 mm	-	M40S-70A503AA0	1203250	M40E-70A503RB0	1203280
	✓	M40S-70A503AA0	1203250	M40E-70A523RB0	1204828

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## Resolution 30 mm

Protective field height	End cap with integrated LED	Sender		Receiver	
		Type	Part no.	Type	Part no.
300 mm	-	M40S-60A303AA0	1201570	M40E-60A303RBO	1201572
	✓	M40S-60A303AA0	1201570	M40E-60A323RBO	1205630
450 mm	-	M40S-61A303AA0	1201127	M40E-61A303RBO	1201214
	✓	M40S-61A303AA0	1201127	M40E-61A323RBO	1205631
600 mm	-	M40S-62A303AA0	1201463	M40E-62A303RBO	1201464
	✓	M40S-62A303AA0	1201463	M40E-62A323RBO	1204362
750 mm	-	M40S-63A303AA0	1201571	M40E-63A303RBO	1201573
	✓	M40S-63A303AA0	1201571	M40E-63A323RBO	1205392
900 mm	-	M40S-64A303AA0	1201441	M40E-64A303RBO	1201442
	✓	M40S-64A303AA0	1201441	M40E-64A323RBO	1204680
1050 mm	-	M40S-65A303AA0	1201482	M40E-65A303RBO	1201483
	✓	M40S-65A303AA0	1201482	M40E-65A323RBO	1205632
1200 mm	-	M40S-66A303AA0	1201036	M40E-66A303RBO	1201035
	✓	M40S-66A303AA0	1201036	M40E-66A323RBO	1204764
1350 mm	-	M40S-67A303AA0	1203236	M40E-67A303RBO	1203242
	✓	M40S-67A303AA0	1203236	M40E-67A323RBO	1205633
1500 mm	-	M40S-68A303AA0	1203237	M40E-68A303RBO	1203243
	✓	M40S-68A303AA0	1203237	M40E-68A323RBO	1204598
1650 mm	-	M40S-69A303AA0	1203238	M40E-69A303RBO	1203244
	✓	M40S-69A303AA0	1203238	M40E-69A323RBO	1205634
1800 mm	-	M40S-70A303AA0	1203239	M40E-70A303RBO	1203245
	✓	M40S-70A303AA0	1203239	M40E-70A323RBO	1204829

## UE403 switching amplifier

Type	Part no.
UE403-A0930	1026287

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### M4000 Advanced Curtain

#### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Protective field height (depending on type)	300 mm ... 1800 mm	
Scanning range		
Configurable	-	✓
Resolution 14 mm	-	0 m ... 2.5 m / 2 m ... 8 m
Resolution 30 mm	-	0 m ... 6 m / 5 m ... 19 m
Response time with beam coding (depending on type)	-	Max. 56 ms <sup>1)</sup>
Response time without beam coding (depending on type)	-	Max. 26 ms <sup>1)</sup>
Protection class	III (EN 50178:1998)	
Enclosure rating	IP 65 (EN 60529)	
Synchronization	Optical, without separate synchronization	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	2.8 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature from ... to	-10 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	52 mm x 55.5 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Housing material	Aluminum alloy ALMGSI 0.5, powder coated	
Front screen material	Polycarbonate, scratch-resistant coating	

<sup>1)</sup> Other response times, see operating instructions.

## Functional data

System part	Sender	Receiver
Restart interlock	-	✓
Restart interlock (delivery status)	-	Activated
External device monitoring	-	✓
External device monitoring (delivery status)	-	Activated
Beam coding		✓
Beam coding (delivery status)		Non-coded
Configurable application diagnostic output	-	✓
Application diagnostic output (delivery status)	-	Contamination (OWS)
Sender test	✓	-
Sender test (delivery status)	Deactivated	-
Configurable scanning range	-	✓
Scanning range (delivery status) (depending on type)	-	8 m / 2.5 m
End cap with integrated LED (optional) (depending on type)	-	✓
SDL interface		✓
Safe device communication via EFI/SDL		✓
Configuration method	PC with CDS (configuration and diagnostic software)	
Concurrence monitoring (with UE403)	-	✓
Monitoring total muting time (with UE403)	-	✓
Sensor gap monitoring (with UE403)	-	✓
Sensor test (with UE403)	-	✓
Partial blanking (with UE403)	-	✓
End of muting by ESPE (with UE403)	-	✓
Belt stop (with UE403)	-	✓
Muting with override (with UE403)	-	✓

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## Electrical data

System part	Sender	Receiver
System connection	M26 x 11 + FE Hirschmann plug	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Extension connection	-	Plug M12 x 5
Supply voltage V <sub>s</sub>	24 V (19.2 V ... 28.8 V) <sup>2)</sup>	
Residual ripple	± 10 %	
Power consumption	Max. 0.2 A	Max. 0.6 A
Display elements	LED/7-segment	
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored <sup>3)</sup>
Switching voltage HIGH	-	24 V DC (V <sub>S</sub> - 2.25 V ... V <sub>S</sub> )
Switching voltage LOW	-	2 V DC
Switching current	-	0 mA ... 500 mA
Application diagnostic output		
Switching voltage HIGH	-	24 V DC (V <sub>S</sub> - 4.2 V ... V <sub>S</sub> )
Switching voltage LOW	-	High resistance
Switching current	-	0 mA ... 100 mA

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> The external voltage supply of the devices must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Applies to a voltage range between -30 V and +30 V.

## UE403 switching amplifier

## General data

Type of muting sensors	Optical sensors, inductive sensors, mechanical switches, controller signals
Protection class	III (EN 50178:1998)
Enclosure rating	IP 65 (IEC 60529)
Safety related parameters	
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	1.0 x 10 <sup>-8</sup> (EN ISO 13849) <sup>1)</sup>
T <sub>M</sub> (Mission Time)	18 years (EN ISO 13849) <sup>1)</sup>
Ambient operating temperature from ... to	-10 °C ... +55 °C
Air humidity from ... to	15 % ... 95 %, non-condensing
Storage temperature from ... to	-25 °C ... +70 °C
Vibration resistance	5 g, 10 Hz ... 55 Hz (IEC 60068-2-6)
Shock resistance	10 g, 16 ms (IEC 60068-2-29)
Housing material	Die-cast aluminum powder coated
Material, connector strip	Polyamide
Assembly	Flexible mounting to the M4000 Advanced or directly in the system

<sup>1)</sup> Only in conjunction with M4000 Advanced Curtain, M4000 Advanced or M4000 Advanced A/P

## Electrical data

Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC), via connected ESPE
Power consumption	Max. 2 A
Inputs override, reset, C1, belt stop, muting sensors	
Switching voltage HIGH	24 V DC (11 V DC ... 30 V DC)
Input current HIGH	10 mA (6 mA ... 15 mA)
Switching voltage LOW	0 V DC (-30 V DC ... 5 V DC)
Input current LOW	0 mA (-0.5 mA ... 1.5 mA)
Outputs voltage supply for reset, override, C1, muting sensors	
Supply voltage	24 V DC (15 V DC ... 28.8 V DC)
Output current for muting sensors	Max. 500 mA <sup>1)</sup>
Output current for reset, override, C1	400 mA <sup>1)</sup>
Muting lamp	
Output current	Monitored 20 mA ... 400 mA, at max. 5 W power consumption Not monitored 0 mA ... 400 mA, at max. 5 W power consumption
Connection type	Socket M12 x 5
Cable length	Max. 10 m <sup>2)</sup>
Wire cross-section	0.34 mm <sup>2</sup>
Cable resistance	< 0.5 Ohm (per cable)

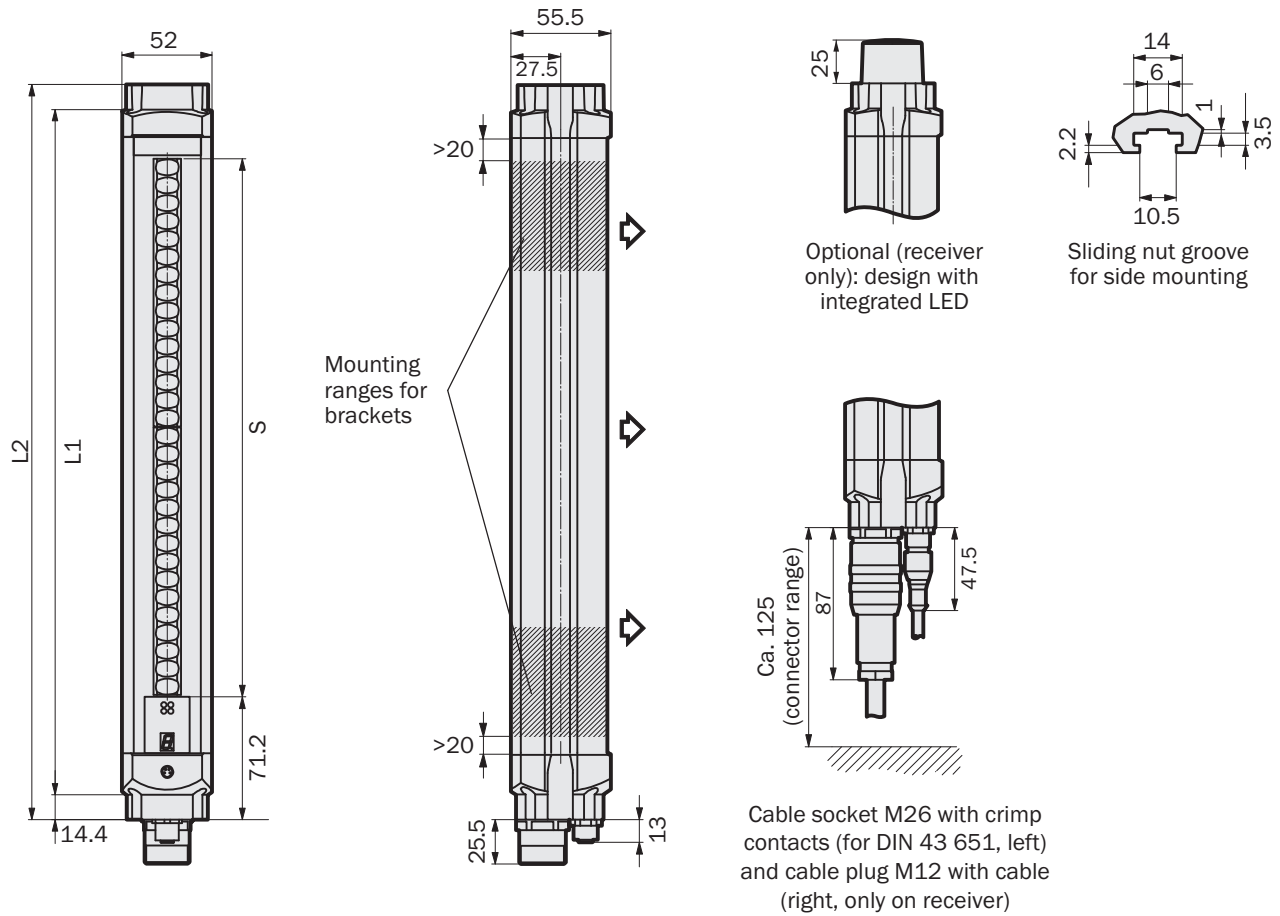
<sup>1)</sup> Total of all supply currents from the connections RES/OVR, A1, A2, B1 and B2 (pin 1 in each case): max. 1000 mA

<sup>2)</sup> Between UE403 and M4000 Advanced / Advanced Curtain as well as between the muting sensors/control switches/muting lamp and UE403



# Dimensional drawings

## M4000 Advanced Curtain

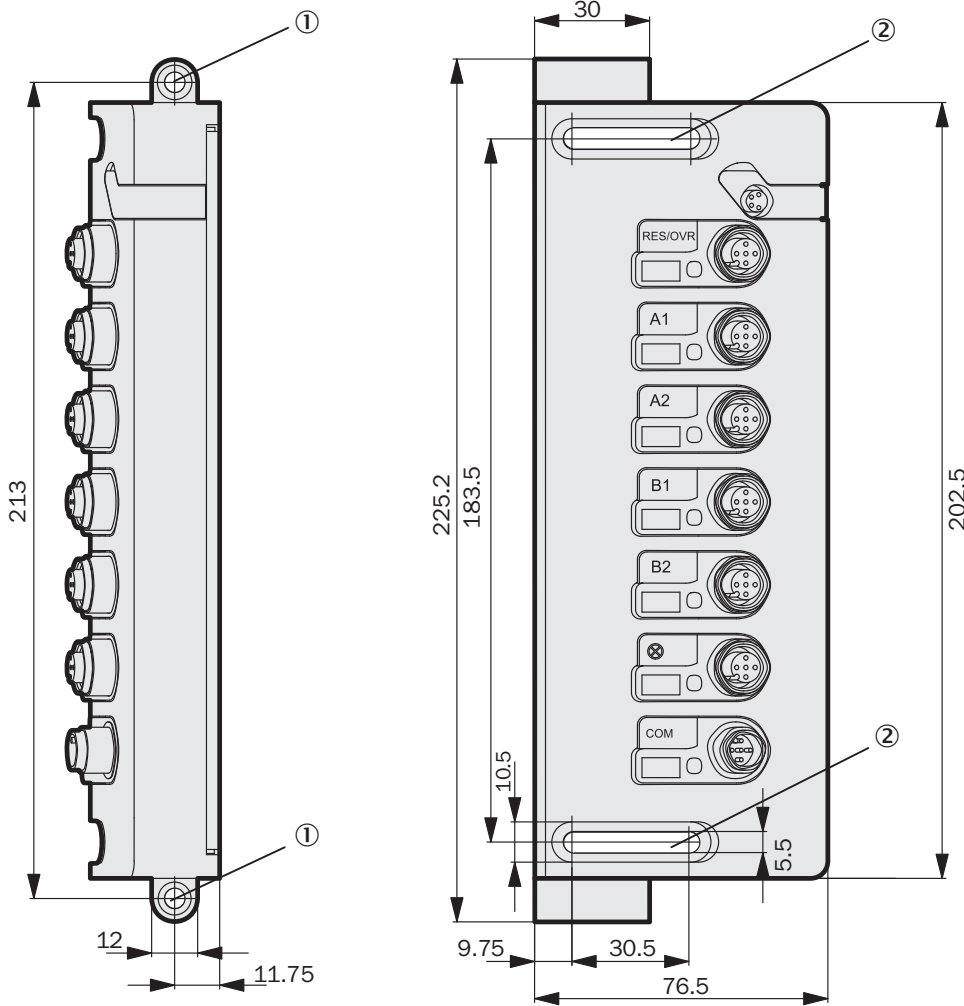


Protective field height S	L1	L2
300	387	416
450	537	566
600	687	716
750	837	866
900	987	1016
1050	1137	1166
1200	1287	1316
1350	1437	1466
1500	1587	1616
1650	1737	1766
1800	1887	1916

Dimensions in mm

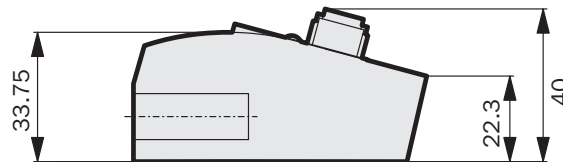
UE403 switching amplifier

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**Note:**

The fixing holes ① and slots ② are suitable for cheese head screws M5 x 30 as per DIN EN ISO 4762.

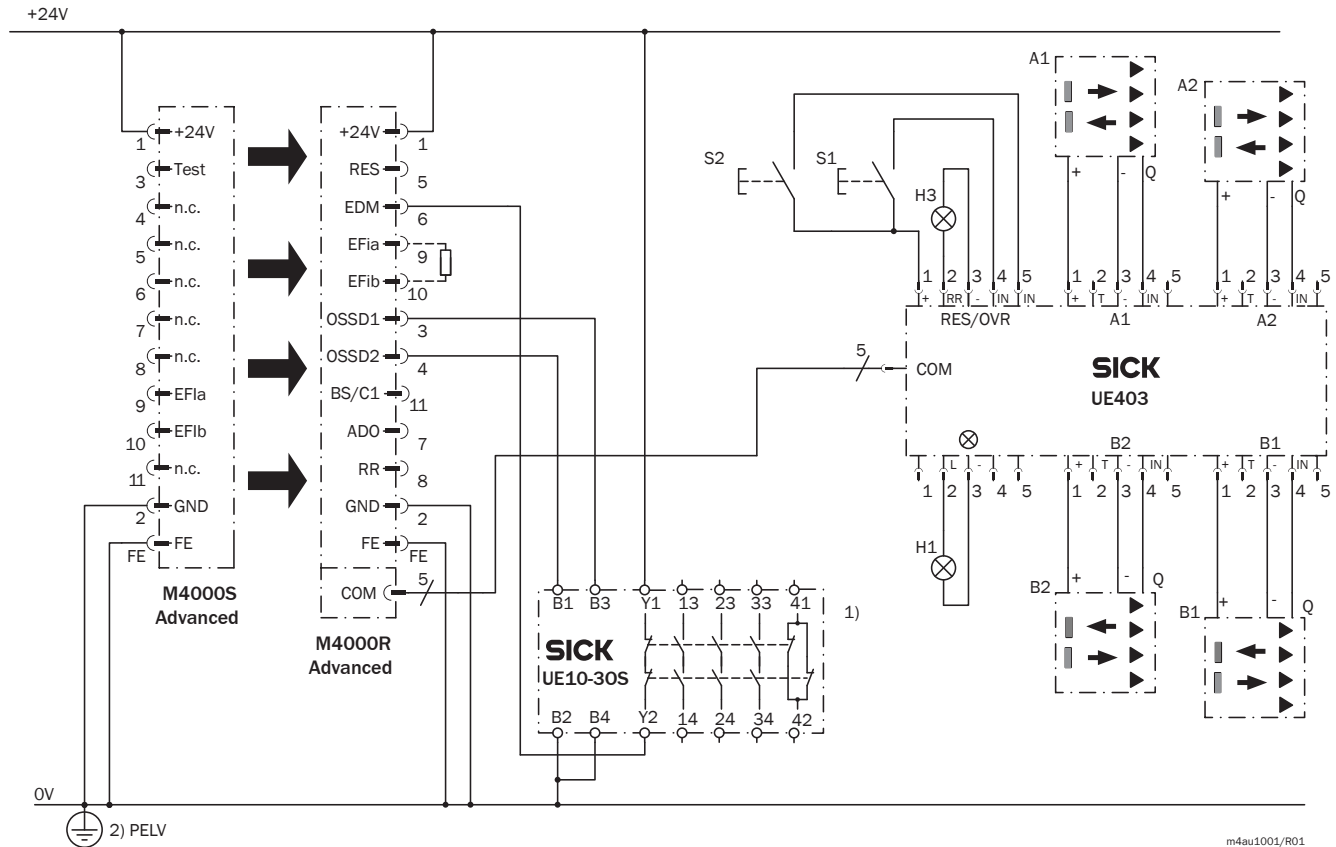


Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### M4000 Advanced Curtain with UE403 switching amplifier connected to UE10-30S safety relay



#### Task

Connection of an M4000 Advanced Curtain safety light curtain with UE403 switching amplifier to a UE10-30S safety relay. Muting with 4 photoelectric reflex switches (dark-switching, PNP). Operating mode: with restart interlock and external device monitoring.

#### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the yellow LED on the receiver and the H3 lamp flash. The system is ready for switch-on and waits for an input signal/switch-on signal. The system is enabled by pressing and releasing the S1 button. The OSSD1 and OSSD2 outputs are live and the UE10-30S is switched on. Upon interruption of one or several of the light beams, the UE10-30S is de-energized by the OSSD1 and OSSD2 outputs.

#### Muting and override

When the light path is clear and the muting input conditions are valid, muting starts. The H1 muting lamp illuminates. Different time and monitoring functions can be configured.

When the light path is interrupted and muting sensors are active, e.g., because of muting errors or a new power on, override is enabled by pressing and releasing the S2 button.

#### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of the UE10-30S will be detected. The shutdown function is retained. On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits.

The failure of one muting sensor will be detected by the muting sequence, and prohibit a new muting cycle. On manipulation (e.g., jamming) of the S2 button, the system does not enable override. A permanent use of the override function will be inhibited through the device.

#### Comments

1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) PELV in accordance with the requirements in EN 60204-1 / 6.4

Take note of the operating instructions of the integrated devices. This applies particularly to the use of configurable functions.

## sens:Control – safe control solutions








Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

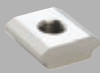
## Accessories

## M4000 Advanced Curtain


## Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 12, swivel mount	4	BEF-2SMGEAKU4	2030510
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMGEAAL4	2044846



## Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	DOL-0612G2M5075KM0	2022544
			5 m	DOL-0612G05M075KM0	2022545
			7.5 m	DOL-0612G7M5075KM0	2022546
			10 m	DOL-0612G10M075KM0	2022547
			15 m	DOL-0612G15M075KM0	2022548
			20 m	DOL-0612G20M075KM0	2022549
			30 m	DOL-0612G30M075KM0	2022550


## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758

## Extension connection cables

Figure	Connection type	Direction of cable outlet	Cable length	Remark	Type	Part no.
	Plug M12 x 5, socket M12 x 5	Plug straight/ socket straight	0.6 m	Connection cable for M4000 Advanced with M12, 5-pin connector and UE403	DSL-1205-G0M6C	6025930
			1 m		DSL-1205-G01MC	6029280
			1.5 m		DSL-1205-G1M5C	6029281
			2 m		DSL-1205-G02MC	6025931
			5 m		DSL-1205-G05MC	6029282


## Configuration connection cables

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649


## Terminators

Description	Remark	Type	Part no.
Terminal with 182 Ω resistance for pin 9 and 10 on the system connection	For improving the EMC behavior if EFI device communication is not used	Terminal with 182 Ω resistance	2027227

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves

Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

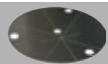



**Mirror columns with protective field height mirror**

Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456


→ For more detailed data on mirror columns and device columns, see page I-0

**Column parts and accessories**

F

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMGEAAL2	2045736
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938


**Additional front screens**

Figure	Suitable for	Remark	Packing unit	Part no.
 Example of use	M40x-60xxxxxx	Including sliding nuts and fixing screws	2	2033235
	M40x-61xxxxxx			2033236
	M40x-62xxxxxx			2033237
	M40x-63xxxxxx			2033238
	M40x-64xxxxxx			2033239
	M40x-65xxxxxx			2033240
	M40x-66xxxxxx			2033241
	M40x-67xxxxxx			2033242
	M40x-68xxxxxx			2033243
	M40x-69xxxxxx			2033244
	M40x-70xxxxxx			2033245



**PNS75 deflector mirrors**

Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
			1800 mm	PNS75-184

**PNS125 deflector mirrors**

Figure	Mirror material	Suitable for protective field height	Type	Part no.		
	Glass	300 mm	PNS125-034	1019425		
		450 mm	PNS125-049	1019426		
		600 mm	PNS125-064	1019427		
		750 mm	PNS125-079	1019428		
		900 mm	PNS125-094	1019429		
		1050 mm	PNS125-109	1019430		
		1200 mm	PNS125-124	1019431		
		1350 mm	PNS125-139	1019432		
		1500 mm	PNS125-154	1019433		
		1650 mm	PNS125-169	1019434		
				1800 mm	PNS125-184	1019435


**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter AR60 for M4000	-	-	-	4040006



**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

## Configuration tools

Figure	Description	Type	Part no.
	For saving and transferring configurations. For C4000 Standard, Advanced, Palletizer, Entry/Exit, Fusion and M4000 Advanced, Advanced Curtain, Area	Clone Plug for C4000 and M4000	1029665
	-	Wall mount	5318443

## Device protection


Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

## UE403 switching amplifier



## Mounting systems

Property	Remark	Packing unit	Type	Part no.
Fixing screws with sliding nuts	Included in the delivery	2	Fixing screws	2033250


## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Part no.
	Plug M12 x 5	Straight	2 m	6026133
			5 m	6026134
			10 m	6026135

## Connectors


Figure	Connection type	Direction of cable outlet	Type	Part no.
	Plug M12 x 4	Straight	STE-1204-G	6009932
	Socket M12 x 4	Angled	DOS-1204-W	6007303

## Extension connection cables

Figure	Connection type	Direction of cable outlet	Cable length	Remark	Type	Part no.
	Plug M12 x 5, socket M12 x 5	Plug straight/ socket straight	0.6 m	Connection cable for M4000 Advanced with M12, 5-pin connector and UE403	DSL-1205-G0M6C	6025930
			1 m		DSL-1205-G01MC	6029280
			1.5 m		DSL-1205-G1M5C	6029281
			2 m		DSL-1205-G02MC	6025931
			5 m		DSL-1205-G05MC	6029282



## Configuration connection cables

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

## Muting sensor connection cables



Connection type	Direction of cable outlet	Cable length	Description	Type	Part no.
Plug M12 x 3	Plug straight/ socket angled	1 m	Suitable for WT27, WL260, WT260 muting sensors, pin 2 (plug) not connected	DSL-1203B01MC34KM1	6026106
		2 m		DSL-1203B02MC34KM1	6026107
		5 m		DSL-1203B05MC34KM2	6025118
Plug M12 x 4	Plug straight/ socket angled	1 m	Suitable for WL24 and WT24 muting sensors	DSL-1204B01MC34KM0	6025974
				Suitable for WL12, WL14, WL18, WL23, WL27 muting sensors, pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	DSL-1204B01MC34KM2
		2 m	Suitable for WL24 and WT24 muting sensors	DSL-1204B02MC34KM0	6025975
				Suitable for WL12, WL14, WL18, WL23, WL27 muting sensors, pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	DSL-1204B02MC34KM2
		5 m	Suitable for WL24 and WT24 muting sensors	DSL-1204B05MC34KM1	6025087
				Suitable for WL12, WL14, WL18, WL23, WL27 muting sensors, pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	DSL-1204B05MC34KM2

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## Configuration software

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

## Muting indicator lamps

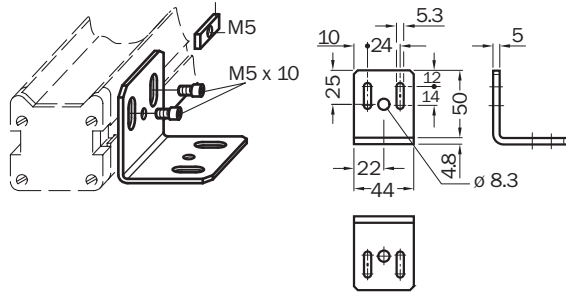
Figure	Type of muting indicator	Connection type	Cable length	Remark	Part no.
 Product may differ from illustration	LED	Connector	2 m	Incl. mounting bracket and mounting kit	2033118
			10 m	Incl. mounting bracket	2033119
 Product may differ from illustration	Incandescent lamp	Connector	2 m	Incl. mounting bracket and mounting kit	2033116
			10 m	Incl. mounting bracket	2033117

## Muting accessories, other

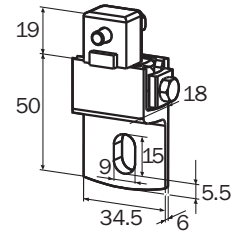
Figure	Type	Part no.
	Protective cap for device socket	6011170

Dimensional drawings mounting systems

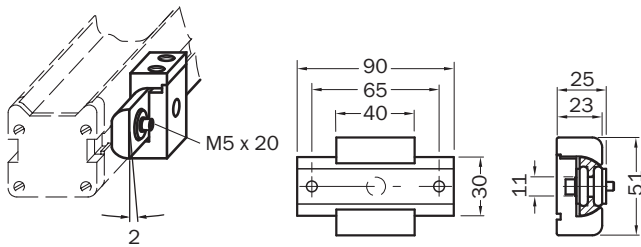
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



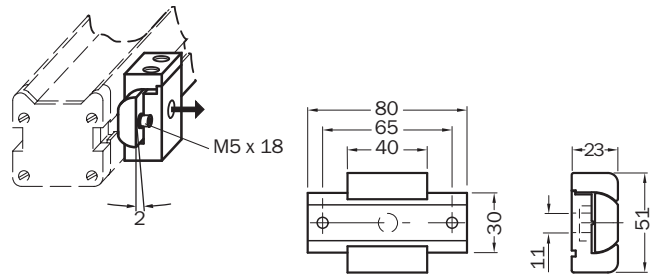
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



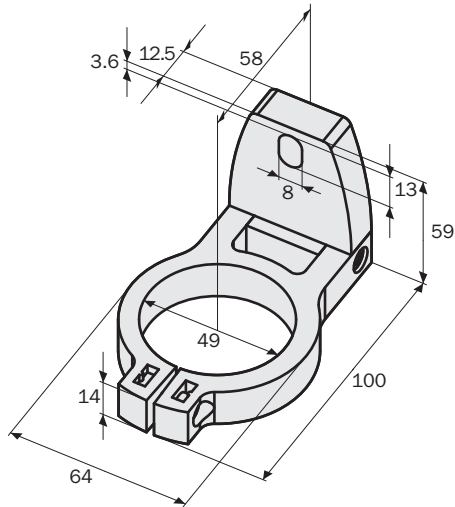
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



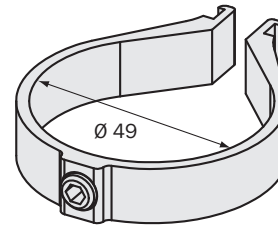
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



**BEF-2SMGEAKU4**  
Mounting kit 12, swivel mount



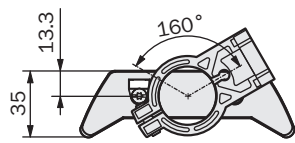
**BEF-2SMGEAAL4**  
Omega bracket, flexible and quick installation with only one screw



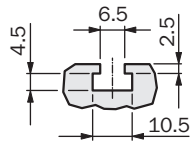
Dimensions in mm

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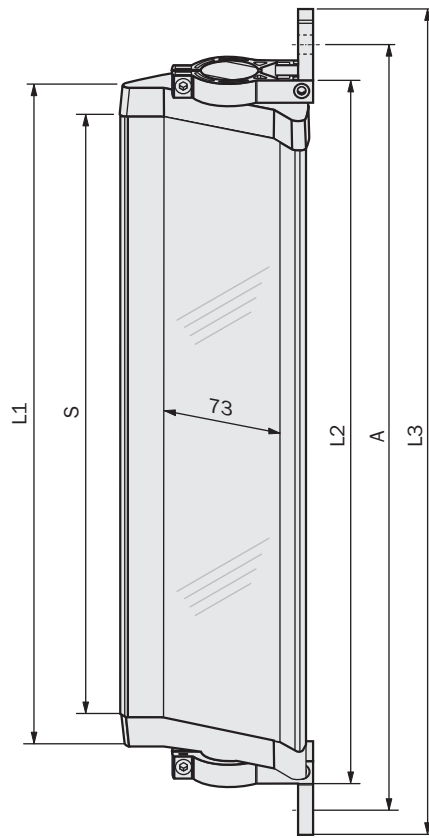
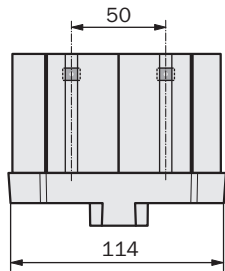
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

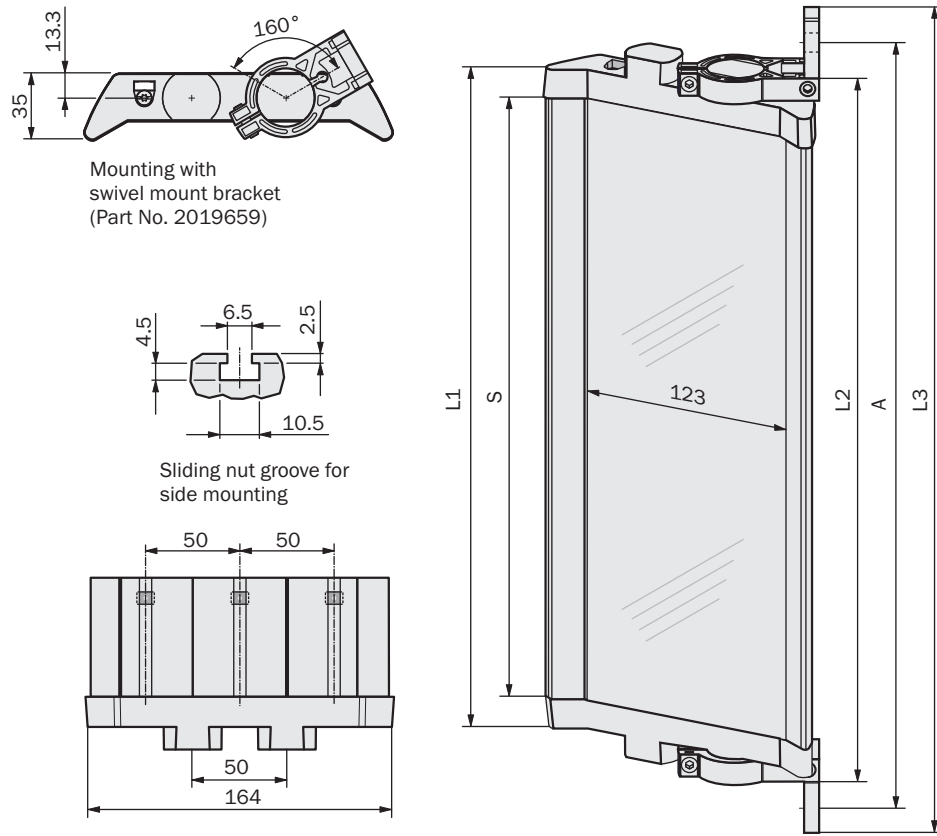


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

## Technical data overview

**Note:** C4000 Select is only available in North America!

Scanning range (depending on type)	0 m ... 8 m / 0 m ... 19 m
Protective field height (depending on type)	300 mm ... 1800 mm
Resolution (depending on type)	14 mm / 30 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (EN 62061)
Enclosure rating	IP 65

## Product description

The C4000 Select safety light curtain is used for hazardous point-of-operation safeguarding applications. It is designed to provide the highest level of safety while simplifying installation and operation.

- Devices are easily configured using DIP switch technology
- Installation times are reduced using the integrated laser alignment aid
- One- and two-beam floating blanking feature allows an object to be present in the protective field, e.g., cables, work piece supports, etc.

- Cascade of additional C4000 Select safety light curtains or an S300/S3000 safety scanner simplifies integration of safety components
- Standard M12 x 5-pin connectors for both system and extendable I/O connections minimize installation costs
- Multiple systems may coexist without interference while in close proximity to one another using SICK's beam coding technology
- Simple, easy-to-understand diagnostics make troubleshooting quick and easy

## In-system added value

Combined with SICK safe control solutions

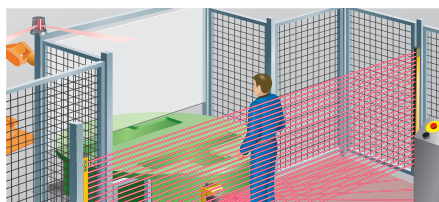
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	O-2
Flexi Soft	✓	✓	✓	O-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

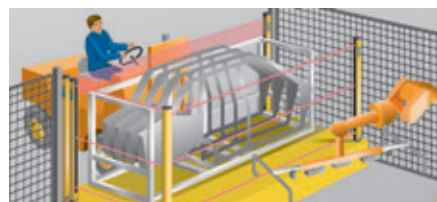
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Car and vehicle industry
- Robotics
- Print and paper industry
- Plastic and rubber industry
- Machine tools
- Wood industry
- Storage and conveyor
- Operator load stations



Combined protection of hazardous point/area in front of a turntable with C4000 Select and S3000



Mutually active access-protection in front of and behind a rack station of a robot cell with C4000 Select and M4000



- DIP switch configuration
- Integrated laser alignment
- Floating blanking
- Beam coding
- Up to 3 systems can be cascaded
- Easy-to-understand diagnostics
- Optional LED on top for 360° viewing



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Further information	Page
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→ Connection diagrams	F-98
→ Accessories	F-99
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

**Note:** C4000 Select is only available in North America!

### C4000 Select without extension connection

Usage	As a standalone system and as last system in a cascade
Connection types	System connection: Plug M12 x 5

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0301A0A00AA0	1208918	XC40E-0301A0A0AAA0	1208951	XC40P-0301A0A0AAA0	1052742
450 mm	XC40S-0401A0A00AA0	1208825	XC40E-0401A0A0AAA0	1208824	XC40P-0401A0A0AAA0	1052743
600 mm	XC40S-0601A0A00AA0	1208919	XC40E-0601A0A0AAA0	1208952	XC40P-0601A0A0AAA0	1052744
750 mm	XC40S-0701A0A00AA0	1208920	XC40E-0701A0A0AAA0	1208953	XC40P-0701A0A0AAA0	1052745
900 mm	XC40S-0901A0A00AA0	1208921	XC40E-0901A0A0AAA0	1208954	XC40P-0901A0A0AAA0	1052746
1050 mm	XC40S-1001A0A00AA0	1208922	XC40E-1001A0A0AAA0	1208955	XC40P-1001A0A0AAA0	1052747
1200 mm	XC40S-1201A0A00AA0	1208923	XC40E-1201A0A0AAA0	1208956	XC40P-1201A0A0AAA0	1052748
1350 mm	XC40S-1301A0A00AA0	1208924	XC40E-1301A0A0AAA0	1208957	XC40P-1301A0A0AAA0	1052749
1500 mm	XC40S-1501A0A00AA0	1208925	XC40E-1501A0A0AAA0	1208958	XC40P-1501A0A0AAA0	1052750
1650 mm	XC40S-1601A0A00AA0	1208926	XC40E-1601A0A0AAA0	1208959	XC40P-1601A0A0AAA0	1052751
1800 mm	XC40S-1801A0A00AA0	1208927	XC40E-1801A0A0AAA0	1208960	XC40P-1801A0A0AAA0	1052752

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0303A0A00AA0	1204061	XC40E-0303A0A0AAA0	1204063	XC40P-0303A0A0AAA0	1043111
450 mm	XC40S-0403A0A00AA0	1208853	XC40E-0403A0A0AAA0	1208852	XC40P-0403A0A0AAA0	1052707
600 mm	XC40S-0603A0A00AA0	1204068	XC40E-0603A0A0AAA0	1204116	XC40P-0603A0A0AAA0	1043112
750 mm	XC40S-0703A0A00AA0	1208855	XC40E-0703A0A0AAA0	1208854	XC40P-0703A0A0AAA0	1052708
900 mm	XC40S-0903A0A00AA0	1204071	XC40E-0903A0A0AAA0	1204191	XC40P-0903A0A0AAA0	1043113
1050 mm	XC40S-1003A0A00AA0	1208856	XC40E-1003A0A0AAA0	1208857	XC40P-1003A0A0AAA0	1052709
1200 mm	XC40S-1203A0A00AA0	1204118	XC40E-1203A0A0AAA0	1204102	XC40P-1203A0A0AAA0	1043114
1350 mm	XC40S-1303A0A00AA0	1208858	XC40E-1303A0A0AAA0	1208859	XC40P-1303A0A0AAA0	1052710
1500 mm	XC40S-1503A0A00AA0	1204119	XC40E-1503A0A0AAA0	1204137	XC40P-1503A0A0AAA0	1043115
1650 mm	XC40S-1603A0A00AA0	1208860	XC40E-1603A0A0AAA0	1208861	XC40P-1603A0A0AAA0	1052711
1800 mm	XC40S-1803A0A00AA0	1204112	XC40E-1803A0A0AAA0	1204138	XC40P-1803A0A0AAA0	1043116

## C4000 Select with integrated LED status indicator (receiver)

Usage	As a standalone system and as last system in a cascade
Connection types	System connection: Plug M12 x 5

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0301A0A00AA0	1208918	XC40E-0301A0A0AAC0	1208961	XC40P-0301A0A0AAC0	1052753
450 mm	XC40S-0401A0A00AA0	1208825	XC40E-0401A0A0AAC0	1208962	XC40P-0401A0A0AAC0	1052754
600 mm	XC40S-0601A0A00AA0	1208919	XC40E-0601A0A0AAC0	1208963	XC40P-0601A0A0AAC0	1052755
750 mm	XC40S-0701A0A00AA0	1208920	XC40E-0701A0A0AAC0	1208964	XC40P-0701A0A0AAC0	1052756
900 mm	XC40S-0901A0A00AA0	1208921	XC40E-0901A0A0AAC0	1208965	XC40P-0901A0A0AAC0	1052757
1050 mm	XC40S-1001A0A00AA0	1208922	XC40E-1001A0A0AAC0	1208966	XC40P-1001A0A0AAC0	1052758
1200 mm	XC40S-1201A0A00AA0	1208923	XC40E-1201A0A0AAC0	1208967	XC40P-1201A0A0AAC0	1052759
1350 mm	XC40S-1301A0A00AA0	1208924	XC40E-1301A0A0AAC0	1208968	XC40P-1301A0A0AAC0	1052760
1500 mm	XC40S-1501A0A00AA0	1208925	XC40E-1501A0A0AAC0	1208969	XC40P-1501A0A0AAC0	1052761
1650 mm	XC40S-1601A0A00AA0	1208926	XC40E-1601A0A0AAC0	1208970	XC40P-1601A0A0AAC0	1052762
1800 mm	XC40S-1801A0A00AA0	1208927	XC40E-1801A0A0AAC0	1208971	XC40P-1801A0A0AAC0	1052763

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0303A0A00AA0	1204061	XC40E-0303A0A0AAC0	1204139	XC40P-0303A0A0AAC0	1043117
450 mm	XC40S-0403A0A00AA0	1208853	XC40E-0403A0A0AAC0	1208862	XC40P-0403A0A0AAC0	1052712
600 mm	XC40S-0603A0A00AA0	1204068	XC40E-0603A0A0AAC0	1204140	XC40P-0603A0A0AAC0	1043118
750 mm	XC40S-0703A0A00AA0	1208855	XC40E-0703A0A0AAC0	1208863	XC40P-0703A0A0AAC0	1052713
900 mm	XC40S-0903A0A00AA0	1204071	XC40E-0903A0A0AAC0	1204141	XC40P-0903A0A0AAC0	1043119
1050 mm	XC40S-1003A0A00AA0	1208856	XC40E-1003A0A0AAC0	1208864	XC40P-1003A0A0AAC0	1052714
1200 mm	XC40S-1203A0A00AA0	1204118	XC40E-1203A0A0AAC0	1204142	XC40P-1203A0A0AAC0	1043120
1350 mm	XC40S-1303A0A00AA0	1208858	XC40E-1303A0A0AAC0	1208865	XC40P-1303A0A0AAC0	1052715
1500 mm	XC40S-1503A0A00AA0	1204119	XC40E-1503A0A0AAC0	1204143	XC40P-1503A0A0AAC0	1043121
1650 mm	XC40S-1603A0A00AA0	1208860	XC40E-1603A0A0AAC0	1208866	XC40P-1603A0A0AAC0	1052716
1800 mm	XC40S-1803A0A00AA0	1204112	XC40E-1803A0A0AAC0	1204144	XC40P-1803A0A0AAC0	1043122

## C4000 Select with top end cap extension connection

<b>Usage</b>	As a standalone system and as first, middle or last system in a cascade
<b>Connection types</b>	System connection: Plug M12 x 5 Extension connection: Socket M12 x 5

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0301A0A00AB0	1208928	XC40E-0301A0A0CAB0	1208972	XC40P-0301A0A0CAB0	1052764
450 mm	XC40S-0401A0A00AB0	1208929	XC40E-0401A0A0CAB0	1208973	XC40P-0401A0A0CAB0	1052765
600 mm	XC40S-0601A0A00AB0	1208930	XC40E-0601A0A0CAB0	1208974	XC40P-0601A0A0CAB0	1052766
750 mm	XC40S-0701A0A00AB0	1208931	XC40E-0701A0A0CAB0	1208975	XC40P-0701A0A0CAB0	1052767
900 mm	XC40S-0901A0A00AB0	1208932	XC40E-0901A0A0CAB0	1208976	XC40P-0901A0A0CAB0	1052768
1050 mm	XC40S-1001A0A00AB0	1208933	XC40E-1001A0A0CAB0	1208977	XC40P-1001A0A0CAB0	1052769
1200 mm	XC40S-1201A0A00AB0	1208934	XC40E-1201A0A0CAB0	1208978	XC40P-1201A0A0CAB0	1052770
1350 mm	XC40S-1301A0A00AB0	1208935	XC40E-1301A0A0CAB0	1208979	XC40P-1301A0A0CAB0	1052771
1500 mm	XC40S-1501A0A00AB0	1208936	XC40E-1501A0A0CAB0	1208980	XC40P-1501A0A0CAB0	1052772
1650 mm	XC40S-1601A0A00AB0	1208937	XC40E-1601A0A0CAB0	1208981	XC40P-1601A0A0CAB0	1052773
1800 mm	XC40S-1801A0A00AB0	1208938	XC40E-1801A0A0CAB0	1208982	XC40P-1801A0A0CAB0	1052774

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0303A0A00AB0	1204069	XC40E-0303A0A0CAB0	1204134	XC40P-0303A0A0CAB0	1043123
450 mm	XC40S-0403A0A00AB0	1208867	XC40E-0403A0A0CAB0	1208868	XC40P-0403A0A0CAB0	1052717
600 mm	XC40S-0603A0A00AB0	1204132	XC40E-0603A0A0CAB0	1204146	XC40P-0603A0A0CAB0	1043124
750 mm	XC40S-0703A0A00AB0	1208869	XC40E-0703A0A0CAB0	1208870	XC40P-0703A0A0CAB0	1052718
900 mm	XC40S-0903A0A00AB0	1204145	XC40E-0903A0A0CAB0	1204147	XC40P-0903A0A0CAB0	1043125
1050 mm	XC40S-1003A0A00AB0	1208871	XC40E-1003A0A0CAB0	1208872	XC40P-1003A0A0CAB0	1052719
1200 mm	XC40S-1203A0A00AB0	1204148	XC40E-1203A0A0CAB0	1204149	XC40P-1203A0A0CAB0	1043126
1350 mm	XC40S-1303A0A00AB0	1208873	XC40E-1303A0A0CAB0	1208874	XC40P-1303A0A0CAB0	1052720
1500 mm	XC40S-1503A0A00AB0	1204150	XC40E-1503A0A0CAB0	1204151	XC40P-1503A0A0CAB0	1043127
1650 mm	XC40S-1603A0A00AB0	1208875	XC40E-1603A0A0CAB0	1208876	XC40P-1603A0A0CAB0	1052721
1800 mm	XC40S-1803A0A00AB0	1204152	XC40E-1803A0A0CAB0	1204153	XC40P-1803A0A0CAB0	1043128



## C4000 Select with bottom end cap extension connection (sender and receiver)

<b>Usage</b>	As a standalone system and as first, middle or last system in a cascade
<b>Connection types</b>	System connection: Plug M12 x 5 Extension connection: Socket M12 x 5

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0301A0A00BA0	1208939	XC40E-0301A0A0CBA0	1208983	XC40P-0301A0A0CBA0	1052775
450 mm	XC40S-0401A0A00BA0	1208940	XC40E-0401A0A0CBA0	1208984	XC40P-0401A0A0CBA0	1052776
600 mm	XC40S-0601A0A00BA0	1208941	XC40E-0601A0A0CBA0	1208985	XC40P-0601A0A0CBA0	1052777
750 mm	XC40S-0701A0A00BA0	1208942	XC40E-0701A0A0CBA0	1208986	XC40P-0701A0A0CBA0	1052778
900 mm	XC40S-0901A0A00BA0	1208944	XC40E-0901A0A0CBA0	1208987	XC40P-0901A0A0CBA0	1052779
1050 mm	XC40S-1001A0A00BA0	1208943	XC40E-1001A0A0CBA0	1208988	XC40P-1001A0A0CBA0	1052780
1200 mm	XC40S-1201A0A00BA0	1208945	XC40E-1201A0A0CBA0	1208989	XC40P-1201A0A0CBA0	1052781
1350 mm	XC40S-1301A0A00BA0	1208946	XC40E-1301A0A0CBA0	1208990	XC40P-1301A0A0CBA0	1052782
1500 mm	XC40S-1501A0A00BA0	1208947	XC40E-1501A0A0CBA0	1208991	XC40P-1501A0A0CBA0	1052783
1650 mm	XC40S-1601A0A00BA0	1208948	XC40E-1601A0A0CBA0	1208992	XC40P-1601A0A0CBA0	1052784
1800 mm	XC40S-1801A0A00BA0	1208949	XC40E-1801A0A0CBA0	1208993	XC40P-1801A0A0CBA0	1052785

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0303A0A00BA0	1204154	XC40E-0303A0A0CBA0	1204155	XC40P-0303A0A0CBA0	1043129
450 mm	XC40S-0403A0A00BA0	1208877	XC40E-0403A0A0CBA0	1208878	XC40P-0403A0A0CBA0	1052722
600 mm	XC40S-0603A0A00BA0	1204156	XC40E-0603A0A0CBA0	1204157	XC40P-0603A0A0CBA0	1043130
750 mm	XC40S-0703A0A00BA0	1208879	XC40E-0703A0A0CBA0	1208894	XC40P-0703A0A0CBA0	1052723
900 mm	XC40S-0903A0A00BA0	1204158	XC40E-0903A0A0CBA0	1204159	XC40P-0903A0A0CBA0	1043131
1050 mm	XC40S-1003A0A00BA0	1208880	XC40E-1003A0A0CBA0	1208881	XC40P-1003A0A0CBA0	1052724
1200 mm	XC40S-1203A0A00BA0	1204160	XC40E-1203A0A0CBA0	1204161	XC40P-1203A0A0CBA0	1043132
1350 mm	XC40S-1303A0A00BA0	1208882	XC40E-1303A0A0CBA0	1208883	XC40P-1303A0A0CBA0	1052725
1500 mm	XC40S-1503A0A00BA0	1204162	XC40E-1503A0A0CBA0	1204163	XC40P-1503A0A0CBA0	1043133
1650 mm	XC40S-1603A0A00BA0	1208884	XC40E-1603A0A0CBA0	1208885	XC40P-1603A0A0CBA0	1052726
1800 mm	XC40S-1803A0A00BA0	1204164	XC40E-1803A0A0CBA0	1204165	XC40P-1803A0A0CBA0	1043134

## C4000 Select with bottom end cap extension connection (sender and receiver) and integrated LED status indicator (receiver)

<b>Usage</b>	As a standalone system and as first, middle or last system in a cascade
<b>Connection types</b>	System connection: Plug M12 x 5 Extension connection: Socket M12 x 5

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0301A0A00BA0	1208939	XC40E-0301A0A0CBC0	1208994	XC40P-0301A0A0CBC0	1052786
450 mm	XC40S-0401A0A00BA0	1208940	XC40E-0401A0A0CBC0	1208995	XC40P-0401A0A0CBC0	1052787
600 mm	XC40S-0601A0A00BA0	1208941	XC40E-0601A0A0CBC0	1208996	XC40P-0601A0A0CBC0	1052788
750 mm	XC40S-0701A0A00BA0	1208942	XC40E-0701A0A0CBC0	1208997	XC40P-0701A0A0CBC0	1052789
900 mm	XC40S-0901A0A00BA0	1208944	XC40E-0901A0A0CBC0	1208998	XC40P-0901A0A0CBC0	1052790
1050 mm	XC40S-1001A0A00BA0	1208943	XC40E-1001A0A0CBC0	1208999	XC40P-1001A0A0CBC0	1052791
1200 mm	XC40S-1201A0A00BA0	1208945	XC40E-1201A0A0CBC0	1209000	XC40P-1201A0A0CBC0	1052792
1350 mm	XC40S-1301A0A00BA0	1208946	XC40E-1301A0A0CBC0	1209001	XC40P-1301A0A0CBC0	1052793
1500 mm	XC40S-1501A0A00BA0	1208947	XC40E-1501A0A0CBC0	1209002	XC40P-1501A0A0CBC0	1052794
1650 mm	XC40S-1601A0A00BA0	1208948	XC40E-1601A0A0CBC0	1209003	XC40P-1601A0A0CBC0	1052795
1800 mm	XC40S-1801A0A00BA0	1208949	XC40E-1801A0A0CBC0	1209004	XC40P-1801A0A0CBC0	1052796

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0303A0A00BA0	1204154	XC40E-0303A0A0CBC0	1204166	XC40P-0303A0A0CBC0	1043135
450 mm	XC40S-0403A0A00BA0	1208877	XC40E-0403A0A0CBC0	1208950	XC40P-0403A0A0CBC0	1052727
600 mm	XC40S-0603A0A00BA0	1204156	XC40E-0603A0A0CBC0	1204167	XC40P-0603A0A0CBC0	1043136
750 mm	XC40S-0703A0A00BA0	1208879	XC40E-0703A0A0CBC0	1208886	XC40P-0703A0A0CBC0	1052728
900 mm	XC40S-0903A0A00BA0	1204158	XC40E-0903A0A0CBC0	1204168	XC40P-0903A0A0CBC0	1043137
1050 mm	XC40S-1003A0A00BA0	1208880	XC40E-1003A0A0CBC0	1208887	XC40P-1003A0A0CBC0	1052729
1200 mm	XC40S-1203A0A00BA0	1204160	XC40E-1203A0A0CBC0	1204169	XC40P-1203A0A0CBC0	1043138
1350 mm	XC40S-1303A0A00BA0	1208882	XC40E-1303A0A0CBC0	1208888	XC40P-1303A0A0CBC0	1052730
1500 mm	XC40S-1503A0A00BA0	1204162	XC40E-1503A0A0CBC0	1204170	XC40P-1503A0A0CBC0	1043139
1650 mm	XC40S-1603A0A00BA0	1208884	XC40E-1603A0A0CBC0	1208889	XC40P-1603A0A0CBC0	1052731
1800 mm	XC40S-1803A0A00BA0	1204164	XC40E-1803A0A0CBC0	1204171	XC40P-1803A0A0CBC0	1043140

## C4000 Select with bottom end cap extension connection (receiver)

Usage	As a standalone system and as first system in a cascade with S300 or S3000 safety laser scanner
Connection types	System connection: Plug M12 x 5 Extension connection: Socket M12 x 5

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0301A0A00AA0	1208918	XC40E-0301A0A0CBA0	1208983	XC40P-0301A0A0CCA0	1052797
450 mm	XC40S-0401A0A00AA0	1208825	XC40E-0401A0A0CBA0	1208984	XC40P-0401A0A0CCA0	1052798
600 mm	XC40S-0601A0A00AA0	1208919	XC40E-0601A0A0CBA0	1208985	XC40P-0601A0A0CCA0	1052799
750 mm	XC40S-0701A0A00AA0	1208920	XC40E-0701A0A0CBA0	1208986	XC40P-0701A0A0CCA0	1052800
900 mm	XC40S-0901A0A00AA0	1208921	XC40E-0901A0A0CBA0	1208987	XC40P-0901A0A0CCA0	1052801
1050 mm	XC40S-1001A0A00AA0	1208922	XC40E-1001A0A0CBA0	1208988	XC40P-1001A0A0CCA0	1052802
1200 mm	XC40S-1201A0A00AA0	1208923	XC40E-1201A0A0CBA0	1208989	XC40P-1201A0A0CCA0	1052803
1350 mm	XC40S-1301A0A00AA0	1208924	XC40E-1301A0A0CBA0	1208990	XC40P-1301A0A0CCA0	1052804
1500 mm	XC40S-1501A0A00AA0	1208925	XC40E-1501A0A0CBA0	1208991	XC40P-1501A0A0CCA0	1052805
1650 mm	XC40S-1601A0A00AA0	1208926	XC40E-1601A0A0CBA0	1208992	XC40P-1601A0A0CCA0	1052806
1800 mm	XC40S-1801A0A00AA0	1208927	XC40E-1801A0A0CBA0	1208993	XC40P-1801A0A0CCA0	1052807

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0303A0A00AA0	1204061	XC40E-0303A0A0CBA0	1204155	XC40P-0303A0A0CCA0	1043141
450 mm	XC40S-0403A0A00AA0	1208853	XC40E-0403A0A0CBA0	1208878	XC40P-0403A0A0CCA0	1052732
600 mm	XC40S-0603A0A00AA0	1204068	XC40E-0603A0A0CBA0	1204157	XC40P-0603A0A0CCA0	1043142
750 mm	XC40S-0703A0A00AA0	1208855	XC40E-0703A0A0CBA0	1208894	XC40P-0703A0A0CCA0	1052733
900 mm	XC40S-0903A0A00AA0	1204071	XC40E-0903A0A0CBA0	1204159	XC40P-0903A0A0CCA0	1043143
1050 mm	XC40S-1003A0A00AA0	1208856	XC40E-1003A0A0CBA0	1208881	XC40P-1003A0A0CCA0	1052734
1200 mm	XC40S-1203A0A00AA0	1204118	XC40E-1203A0A0CBA0	1204161	XC40P-1203A0A0CCA0	1043144
1350 mm	XC40S-1303A0A00AA0	1208858	XC40E-1303A0A0CBA0	1208883	XC40P-1303A0A0CCA0	1052735
1500 mm	XC40S-1503A0A00AA0	1204119	XC40E-1503A0A0CBA0	1204163	XC40P-1503A0A0CCA0	1043145
1650 mm	XC40S-1603A0A00AA0	1208860	XC40E-1603A0A0CBA0	1208885	XC40P-1603A0A0CCA0	1052736
1800 mm	XC40S-1803A0A00AA0	1204112	XC40E-1803A0A0CBA0	1204165	XC40P-1803A0A0CCA0	1043146

## C4000 Select with bottom end cap extension connection and integrated LED status indicator (receiver)

Usage	As a standalone system and as first system in a cascade with S300 or S3000 safety laser scanner
Connection types	System connection: Plug M12 x 5 Extension connection: Socket M12 x 5

- Resolution: 14 mm
- Scanning range: 0 m ... 8 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0301A0A00AA0	1208918	XC40E-0301A0A0CBC0	1208994	XC40P-0301A0A0CCCO	1052808
450 mm	XC40S-0401A0A00AA0	1208825	XC40E-0401A0A0CBC0	1208995	XC40P-0401A0A0CCCO	1052809
600 mm	XC40S-0601A0A00AA0	1208919	XC40E-0601A0A0CBC0	1208996	XC40P-0601A0A0CCCO	1052810
750 mm	XC40S-0701A0A00AA0	1208920	XC40E-0701A0A0CBC0	1208997	XC40P-0701A0A0CCCO	1052811
900 mm	XC40S-0901A0A00AA0	1208921	XC40E-0901A0A0CBC0	1208998	XC40P-0901A0A0CCCO	1052812
1050 mm	XC40S-1001A0A00AA0	1208922	XC40E-1001A0A0CBC0	1208999	XC40P-1001A0A0CCCO	1052813
1200 mm	XC40S-1201A0A00AA0	1208923	XC40E-1201A0A0CBC0	1209000	XC40P-1201A0A0CCCO	1052814
1350 mm	XC40S-1301A0A00AA0	1208924	XC40E-1301A0A0CBC0	1209001	XC40P-1301A0A0CCCO	1052815
1500 mm	XC40S-1501A0A00AA0	1208925	XC40E-1501A0A0CBC0	1209002	XC40P-1501A0A0CCCO	1052816
1650 mm	XC40S-1601A0A00AA0	1208926	XC40E-1601A0A0CBC0	1209003	XC40P-1601A0A0CCCO	1052817
1800 mm	XC40S-1801A0A00AA0	1208927	XC40E-1801A0A0CBC0	1209004	XC40P-1801A0A0CCCO	1052818

- Resolution: 30 mm
- Scanning range: 0 m ... 19 m

Protective field height	Sender		Receiver		Sender/receiver	
	Type	Part no.	Type	Part no.	Type	Part no.
300 mm	XC40S-0303A0A00AA0	1204061	XC40E-0303A0A0CBC0	1204166	XC40P-0303A0A0CCCO	1043147
450 mm	XC40S-0403A0A00AA0	1208853	XC40E-0403A0A0CBC0	1208950	XC40P-0403A0A0CCCO	1052737
600 mm	XC40S-0603A0A00AA0	1204068	XC40E-0603A0A0CBC0	1204167	XC40P-0603A0A0CCCO	1043148
750 mm	XC40S-0703A0A00AA0	1208855	XC40E-0703A0A0CBC0	1208886	XC40P-0703A0A0CCCO	1052738
900 mm	XC40S-0903A0A00AA0	1204071	XC40E-0903A0A0CBC0	1204168	XC40P-0903A0A0CCCO	1043149
1050 mm	XC40S-1003A0A00AA0	1208856	XC40E-1003A0A0CBC0	1208887	XC40P-1003A0A0CCCO	1052739
1200 mm	XC40S-1203A0A00AA0	1204118	XC40E-1203A0A0CBC0	1204169	XC40P-1203A0A0CCCO	1043150
1350 mm	XC40S-1303A0A00AA0	1208858	XC40E-1303A0A0CBC0	1208888	XC40P-1303A0A0CCCO	1052740
1500 mm	XC40S-1503A0A00AA0	1204119	XC40E-1503A0A0CBC0	1204170	XC40P-1503A0A0CCCO	1043151
1650 mm	XC40S-1603A0A00AA0	1208860	XC40E-1603A0A0CBC0	1208889	XC40P-1603A0A0CCCO	1052741
1800 mm	XC40S-1803A0A00AA0	1204112	XC40E-1803A0A0CBC0	1204171	XC40P-1803A0A0CCCO	1043152

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Protective field height (depending on type)	300 mm ... 1800 mm	
Scanning range (depending on type)		
Configurable	-	✓
Resolution 14 mm	-	0 m ... 2.5 m / 0 m ... 8 m
Resolution 30 mm	-	0 m ... 8 m / 5 m ... 19 m
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (EN 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	3.2 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 26 ms <sup>1)</sup>
Synchronization	Optical, without separate synchronization	
Protection class	III (EN 50178:1998)	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	52 mm x 55.5 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Housing material	Aluminum alloy ALMGSI 0.5	

<sup>1)</sup> Without beam coding, without blanking, no cascaded systems. Other response times, see operating instructions.

### Functional data

System part	Sender	Receiver
Beam coding	✓	
Beam coding (delivery status)	Non-coded	
Blanking	1 beam floating blanking, 2 beam floating blanking	
Delivery status	Deactivated	
Configuration method	DIP switch	
Integrated laser alignment aid	✓	
End cap with integrated LED (depending on type)	-	- / ✓

## Electrical data

System part	Sender	Receiver
System connection	Plug M12 x 5	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	$\pm 10\%$ <sup>3)</sup>	
Power consumption (depending on type)	4.9 W ... 9.3 W	7.6 W ... 11.2 W
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	24 V DC ( $V_S - 2.25$ V DC ... $V_S$ )
Switching voltage LOW	-	2 V DC
Switching current	-	Max. 500 mA
Switch off time	-	Min. 100 ms

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

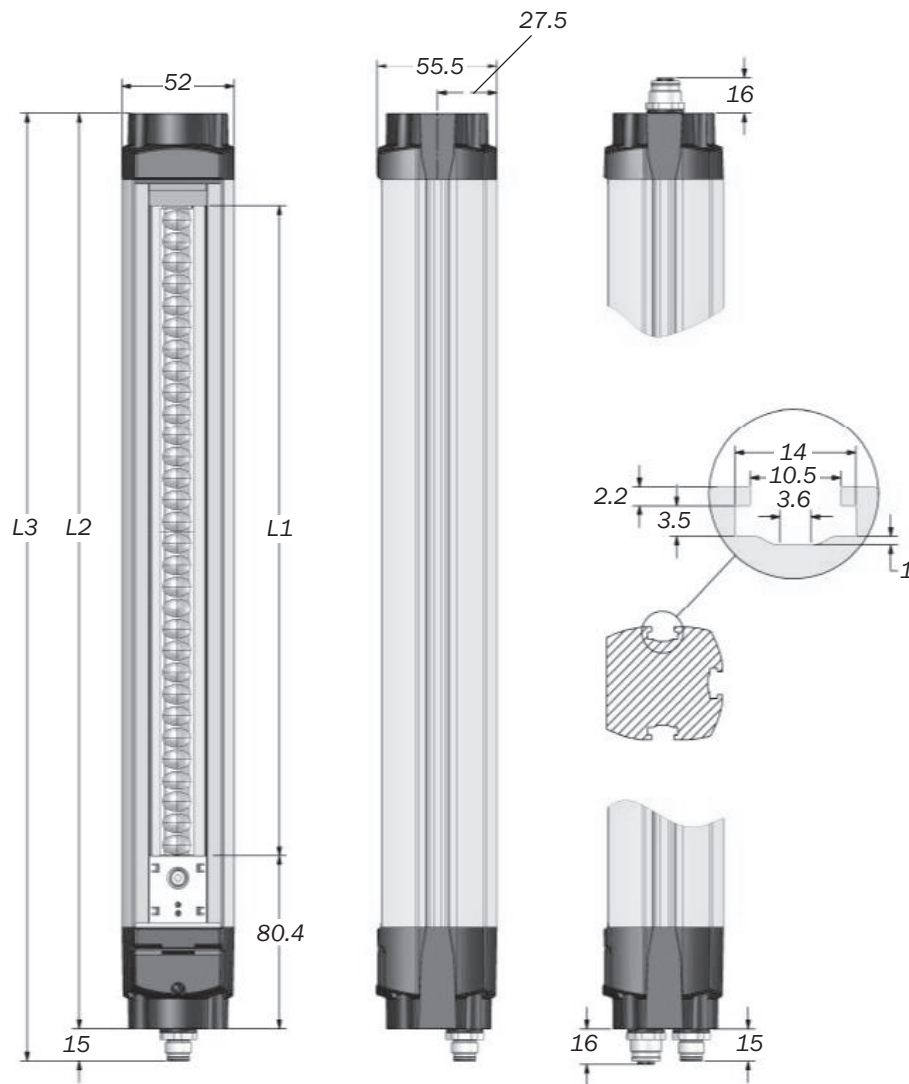
<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of  $V_S$ .

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## Dimensional drawings

### Sender

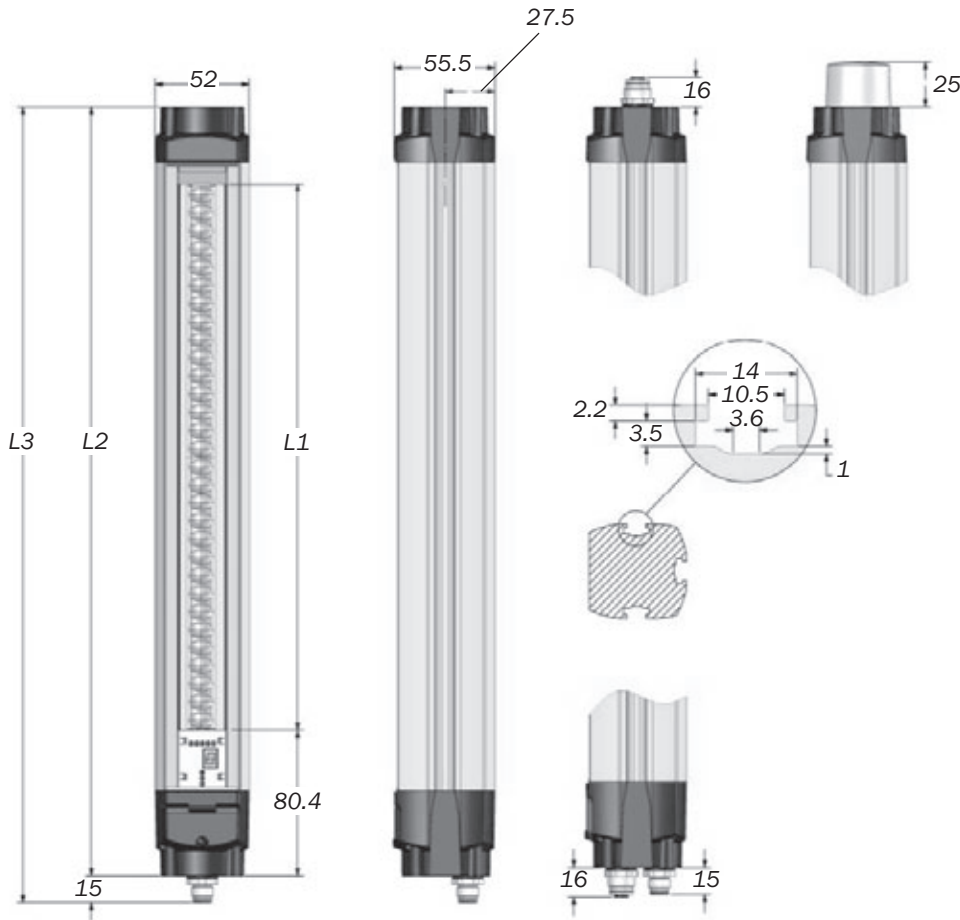


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Protective field height S	L1	L2	L3
300	302	425	440
450	452	575	590
600	602	725	740
750	752	875	890
900	902	1025	1040
1050	1052	1175	1190
1200	1202	1325	1340
1350	1352	1475	1490
1500	1502	1625	1640
1650	1652	1775	1790
1800	1802	1925	1940

Dimensions in mm

Receiver



F

Protective field height S	L1	L2	L3
300	302	425	440
450	452	575	590
600	602	725	740
750	752	875	890
900	902	1025	1040
1050	1052	1175	1190
1200	1202	1325	1340
1350	1352	1475	1490
1500	1502	1625	1640
1650	1652	1775	1790
1800	1802	1925	1940

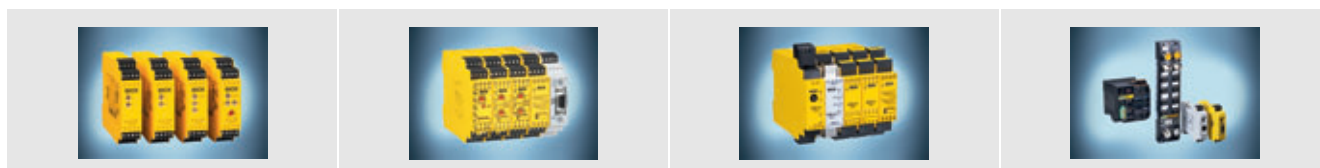
Dimensions in mm

## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)



## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories

### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 12, swivel mount	4	BEF-2SMGEAKU4	2030510
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMGEAAL4	2044846

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### Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Plug M12 x 5	Straight	10 m	Plug	6026135
	Socket M12 x 5	Straight	2 m	DOL-1205-G02M	6008899
			5 m	DOL-1205-G05M	6009868
			10 m	DOL-1205-G10M	6010544
			15 m	DOL-1205-G15M	6029215
			30 m	Connection cable	6032956


### Connection cables

Connection type	Direction of cable outlet	Remark	Cable length	Part no.
Plug M12 x 5, socket M12 x 5	Plug straight/ socket straight	For use with DeviceNet Safety remote I/Os and controller	2 m	2044610
			5 m	2044611
			10 m	2044612
			15 m	2044613
			30 m	2044614


**T-junction**

Connection type	Remark	Type	Part no.
Plug M12 x 5	T-connector plugs directly into receiver, splits the single home run from control cabinet between sender and receiver	DSC-1205T000025KM0	6030664




**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789


**Device columns with external grooves**

Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646


**Column parts and accessories**

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMGEAAL2	2045736

**Additional front screens**

Figure	Suitable for	Remark	Packing unit	Part no.
 Example of use	M40x-60xxxxxx, XC40x-03xxxxxxxxxx	Including sliding nuts and fixing screws	2	2033235
	M40x-61xxxxxx, XC40x-04xxxxxxxxxx			2033236
	M40x-62xxxxxx, XC40x-06xxxxxxxxxx			2033237
	M40x-63xxxxxx, XC40x-07xxxxxxxxxx			2033238
	M40x-64xxxxxx, XC40x-09xxxxxxxxxx			2033239
	M40x-65xxxxxx, XC40x-10xxxxxxxxxx			2033240
	M40x-66xxxxxx, XC40x-12xxxxxxxxxx			2033241
	M40x-67xxxxxx, XC40x-13xxxxxxxxxx			2033242
	M40x-68xxxxxx, XC40x-15xxxxxxxxxx			2033243
	M40x-69xxxxxx, XC40x-16xxxxxxxxxx			2033244
	M40x-70xxxxxx, XC40x-18xxxxxxxxxx			2033245

**PNS75 deflector mirrors**



Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
			1800 mm	PNS75-184

**PNS125 deflector mirrors**

Figure	Mirror material	Suitable for protective field height	Type	Part no.		
	Glass	300 mm	PNS125-034	1019425		
		450 mm	PNS125-049	1019426		
		600 mm	PNS125-064	1019427		
		750 mm	PNS125-079	1019428		
		900 mm	PNS125-094	1019429		
		1050 mm	PNS125-109	1019430		
		1200 mm	PNS125-124	1019431		
		1350 mm	PNS125-139	1019432		
		1500 mm	PNS125-154	1019433		
		1650 mm	PNS125-169	1019434		
				1800 mm	PNS125-184	1019435

F

**Device protection**

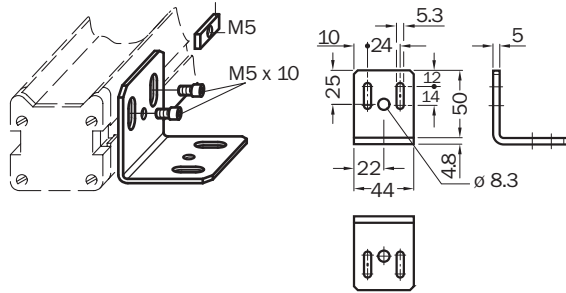
Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

**Protective cap**

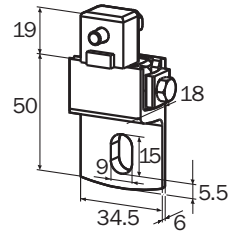
Packing unit	Part no.
10	2019706
1	5311099

Dimensional drawings mounting systems

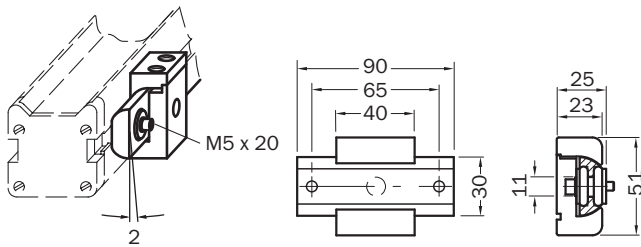
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



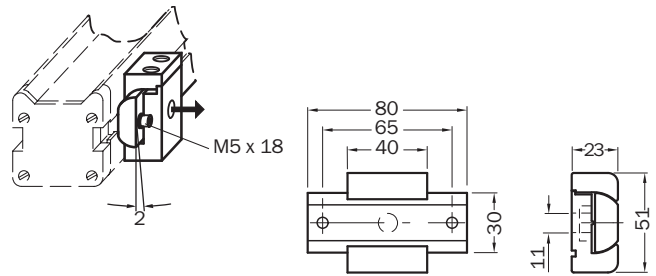
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



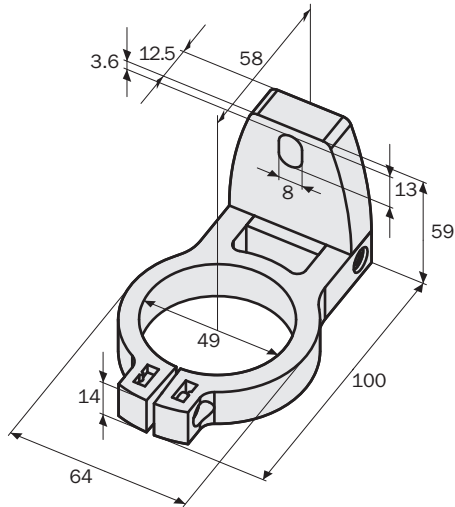
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



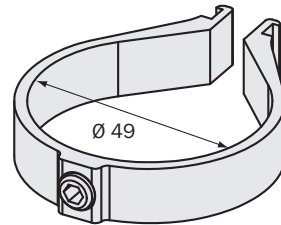
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



**BEF-2SMGEAKU4**  
Mounting kit 12, swivel mount



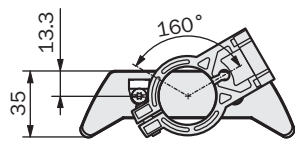
**BEF-2SMGEAAL4**  
Omega bracket, flexible and quick installation with only one screw



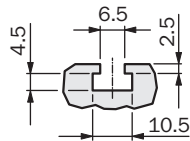
Dimensions in mm

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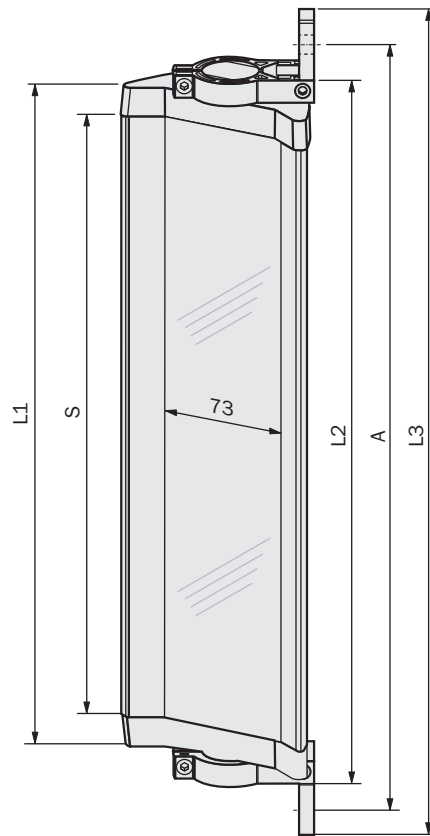
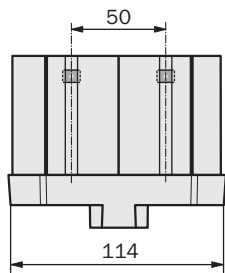
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

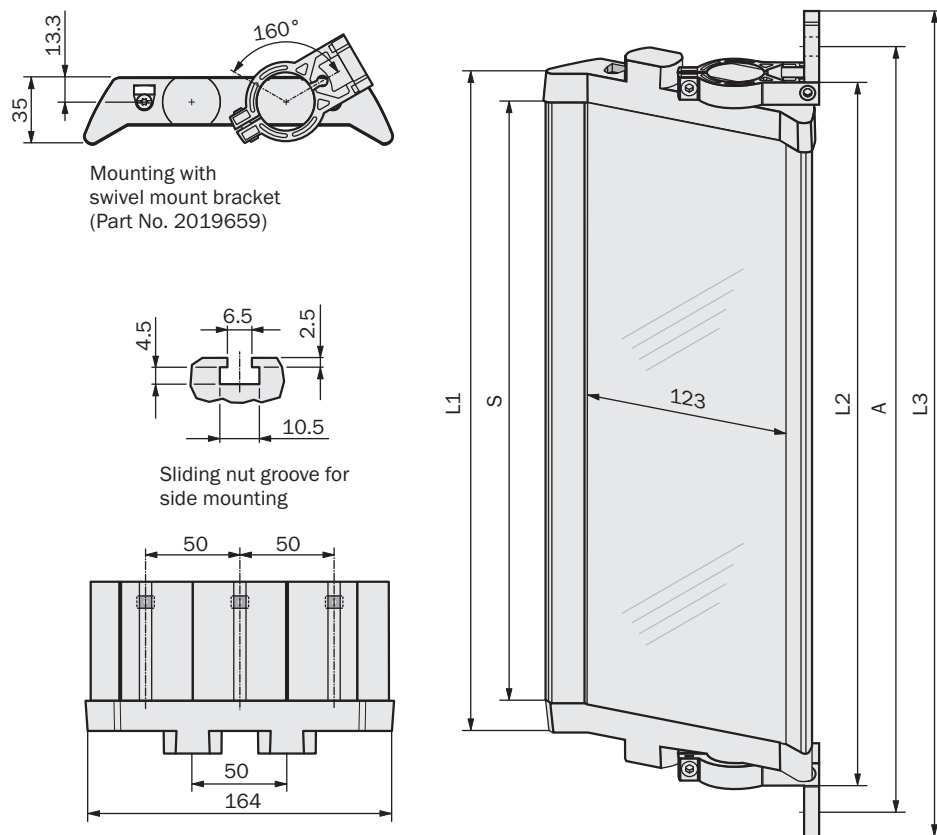


F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

## Technical data overview

Protective field height (depending on type)	120 mm ... 1200 mm
Scanning range	Min. 0 m ... 4 m / typ. 0 m ... 5 m
Resolution (depending on type)	14 mm / 24 mm / 34 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The miniTwin4 safety light curtain is primarily used for hazardous point protection (finger and hand protection). Thanks to innovative technology, the device offers the customer significant advantages:

- Standardization of the sticks: the innovative Twin Sticks (S/R Stick) reduce the number of system components by up to 50 %. The clear advantages can be seen over the entire life cycle.
- Simplification of the service concept: the simple system construction reduces the effort for training courses and planning the service concept.
- Cost-effective machine integration: very small shape, cascading and fine graduation of the protective field lengths make flexible adaptation to the machine design possible.

- Handling: the simple, software-free commissioning is almost fully automatic. Modern industrial design combines the requirements for intuitive operation with durable appearance.
- The trend toward machines with high-quality ergonomic design places special requirements on safety light curtains. For the first time, innovative designs make it possible to use the optimal safety distance, even in positions that were critical in the past.
- Standardization of the accessories: for the first time, it is possible to use additional safety functions on a 5-core cable. Easy-to-mount brackets save space, provides simple commissioning and is a cost-effective alternative to the special solutions used in the past.

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

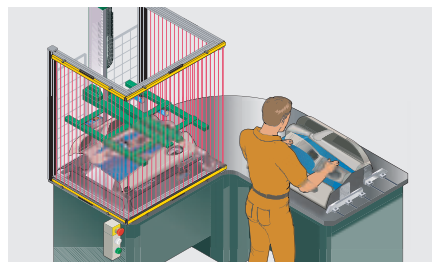
→ For more combinations, see annex

## Applications

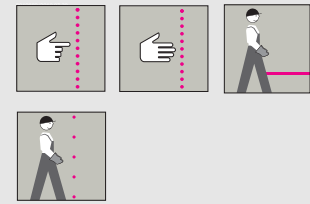
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)



Parts supplier industry: Hazardous point protection at assembly machine



Parts-supplier industry: U-Shape like hazardous point protection at assembly machine



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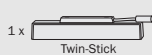


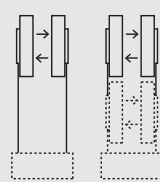
- Optimal integration due to miniaturization
- Up to 3 systems can be cascaded
- Automatic beam coding
- Alignment and diagnostics via LED display
- External device monitoring (EDM) and reset
- Configuration without PC



Further information	Page
→ Ordering information	F-106
→ Technical specifications	F-112
→ Dimensional drawings	F-113
→ Connection diagrams	F-113
→ Accessories	F-114
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### miniTwin4 as a standalone device or cascade end unit

Consisting of		Usage
 1 x Twin-Stick  2 x C-Fix bracket  2 x L-Fix bracket	<ul style="list-style-type: none"> <li>Twin-Stick with standalone system plug and connecting cable with plug M12 x 4 + FE</li> <li>2 C-Fix brackets with L-Fix bracket</li> <li>Operating instructions on CD-ROM</li> </ul>	 <ul style="list-style-type: none"> <li>As a standalone device</li> <li>As a cascade end unit</li> </ul>
<b>Connection types</b>		System connection: Plug M12 x 4 + FE
<b>Scanning range</b>		
<b>Minimum</b>		0 m ... 4 m
<b>Typically</b>		0 m ... 5 m

## F

### Resolution 14 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01214ABB03BE0	1207094
180 mm		C4MT-01814ABB03BE0	1207097
240 mm	350 mm	C4MT-02414ABB03DE0	1207098
300 mm		C4MT-03014ABB03DE0	1207099
360 mm		C4MT-03614ABB03DE0	1207100
420 mm		C4MT-04214ABB03DE0	1207101
480 mm		C4MT-04814ABB03DE0	1207102
540 mm		C4MT-05414ABB03DE0	1207103
600 mm		C4MT-06014ABB03FE0	1207104
660 mm	700 mm	C4MT-06614ABB03FE0	1207105
720 mm		C4MT-07214ABB03FE0	1207106
780 mm		C4MT-07814ABB03FE0	1207107
840 mm		C4MT-08414ABB03FE0	1207108
900 mm		C4MT-09014ABB03FE0	1207109
960 mm		C4MT-09614ABB03FE0	1207110
1020 mm		C4MT-10214ABB03FE0	1207111
1080 mm		C4MT-10814ABB03FE0	1207112
1140 mm		C4MT-11414ABB03FE0	1207113
1200 mm		C4MT-12014ABB03FE0	1207114



## ■ Resolution 24 mm

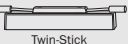
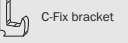
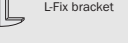
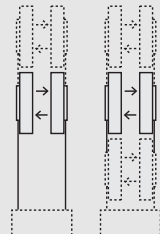
Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01224ABB03BEO	1207222
180 mm		C4MT-01824ABB03BEO	1207223
240 mm	350 mm	C4MT-02424ABB03DEO	1207224
300 mm		C4MT-03024ABB03DEO	1207225
360 mm		C4MT-03624ABB03DEO	1207227
420 mm		C4MT-04224ABB03DEO	1207228
480 mm		C4MT-04824ABB03DEO	1207229
540 mm		C4MT-05424ABB03DEO	1207230
600 mm		700 mm	C4MT-06024ABB03FEO
660 mm	C4MT-06624ABB03FEO		1207232
720 mm	C4MT-07224ABB03FEO		1207233
780 mm	C4MT-07824ABB03FEO		1207234
840 mm	C4MT-08424ABB03FEO		1207235
900 mm	C4MT-09024ABB03FEO		1207236
960 mm	C4MT-09624ABB03FEO		1207237
1020 mm	C4MT-10224ABB03FEO		1207238
1080 mm	C4MT-10824ABB03FEO		1207239
1140 mm	C4MT-11424ABB03FEO		1207240
1200 mm	C4MT-12024ABB03FEO		1207241

## ■ Resolution 34 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01234ABB03BEO	1207242
180 mm		C4MT-01834ABB03BEO	1207243
240 mm	350 mm	C4MT-02434ABB03DEO	1207244
300 mm		C4MT-03034ABB03DEO	1207245
360 mm		C4MT-03634ABB03DEO	1207246
420 mm		C4MT-04234ABB03DEO	1207247
480 mm		C4MT-04834ABB03DEO	1207248
540 mm		C4MT-05434ABB03DEO	1207249
600 mm		700 mm	C4MT-06034ABB03FEO
660 mm	C4MT-06634ABB03FEO		1207251
720 mm	C4MT-07234ABB03FEO		1207252
780 mm	C4MT-07834ABB03FEO		1207253
840 mm	C4MT-08434ABB03FEO		1207254
900 mm	C4MT-09034ABB03FEO		1207255
960 mm	C4MT-09634ABB03FEO		1207256
1020 mm	C4MT-10234ABB03FEO		1207257
1080 mm	C4MT-10834ABB03FEO		1207258
1140 mm	C4MT-11434ABB03FEO		1207259
1200 mm	C4MT-12034ABB03FEO		1207260

F

miniTwin4 as a cascaded host or guest device – not as a cascade end unit

Consisting of		Usage
<p>1 x  Twin-Stick</p> <p>2 x  C-Fix bracket</p> <p>2 x  L-Fix bracket</p>	<ul style="list-style-type: none"> <li>■ Twin-Stick with cascade system plug and 2 connecting cables with plug and socket M12 x 4 + FE</li> <li>■ 2 C-Fix brackets with L-Fix bracket</li> <li>■ Operating instructions on CD-ROM</li> </ul>	 <ul style="list-style-type: none"> <li>■ As a cascaded host or guest device – not as a cascade end unit</li> </ul>
<b>Connection types</b>		System connection: Plug M12 x 4 + FE Extension connection: Socket M12 x 4 + FE
<b>Scanning range</b>		
<b>Minimum</b>		0 m ... 4 m
<b>Typically</b>		0 m ... 5 m

F

■ Resolution 14 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01214ABB04BE0	1207115
180 mm		C4MT-01814ABB04BE0	1207116
240 mm	350 mm	C4MT-02414ABB04DE0	1207117
300 mm		C4MT-03014ABB04DE0	1207118
360 mm		C4MT-03614ABB04DE0	1207119
420 mm		C4MT-04214ABB04DE0	1207120
480 mm		C4MT-04814ABB04DE0	1207121
540 mm		C4MT-05414ABB04DE0	1207122
600 mm		700 mm	C4MT-06014ABB04FE0
660 mm	C4MT-06614ABB04FE0		1207124
720 mm	C4MT-07214ABB04FE0		1207125
780 mm	C4MT-07814ABB04FE0		1207126
840 mm	C4MT-08414ABB04FE0		1207127
900 mm	C4MT-09014ABB04FE0		1207128
960 mm	C4MT-09614ABB04FE0		1207129
1020 mm	C4MT-10214ABB04FE0		1207130
1080 mm	C4MT-10814ABB04FE0		1207131
1140 mm	C4MT-11414ABB04FE0		1207132
1200 mm	C4MT-12014ABB04FE0	1207133	

## ■ Resolution 24 mm

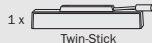
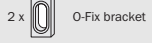
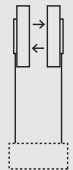
Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01224ABB04BE0	1207168
180 mm		C4MT-01824ABB04BE0	1207283
240 mm	350 mm	C4MT-02424ABB04DE0	1207284
300 mm		C4MT-03024ABB04DE0	1207285
360 mm		C4MT-03624ABB04DE0	1207286
420 mm		C4MT-04224ABB04DE0	1207287
480 mm		C4MT-04824ABB04DE0	1207181
540 mm		C4MT-05424ABB04DE0	1207288
600 mm		C4MT-06024ABB04FE0	1207289
660 mm	700 mm	C4MT-06624ABB04FE0	1207290
720 mm		C4MT-07224ABB04FE0	1207291
780 mm		C4MT-07824ABB04FE0	1207292
840 mm		C4MT-08424ABB04FE0	1207293
900 mm		C4MT-09024ABB04FE0	1207294
960 mm		C4MT-09624ABB04FE0	1207295
1020 mm		C4MT-10224ABB04FE0	1207296
1080 mm		C4MT-10824ABB04FE0	1207297
1140 mm		C4MT-11424ABB04FE0	1207298
1200 mm		C4MT-12024ABB04FE0	1207299

F

## ■ Resolution 34 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01234ABB04BE0	1207300
180 mm		C4MT-01834ABB04BE0	1207301
240 mm	350 mm	C4MT-02434ABB04DE0	1207302
300 mm		C4MT-03034ABB04DE0	1207303
360 mm		C4MT-03634ABB04DE0	1207304
420 mm		C4MT-04234ABB04DE0	1207305
480 mm		C4MT-04834ABB04DE0	1207306
540 mm		C4MT-05434ABB04DE0	1207307
600 mm		C4MT-06034ABB04FE0	1207308
660 mm	700 mm	C4MT-06634ABB04FE0	1207309
720 mm		C4MT-07234ABB04FE0	1207310
780 mm		C4MT-07834ABB04FE0	1207311
840 mm		C4MT-08434ABB04FE0	1207312
900 mm		C4MT-09034ABB04FE0	1207313
960 mm		C4MT-09634ABB04FE0	1207314
1020 mm		C4MT-10234ABB04FE0	1207315
1080 mm		C4MT-10834ABB04FE0	1207316
1140 mm		C4MT-11434ABB04FE0	1207317
1200 mm		C4MT-12034ABB04FE0	1206993

miniTwin4 as a standalone device

<b>Consisting of</b>		<b>Usage</b>	
 	<ul style="list-style-type: none"> <li>▪ Twin-Stick with standalone system plug and 1 connecting cable with plug M12 x 4 + FE</li> <li>▪ 2 O-Fix brackets</li> <li>▪ Operating instructions on CD-ROM</li> </ul>		<ul style="list-style-type: none"> <li>▪ As a standalone device</li> </ul>
<b>Connection types</b>		System connection: Plug M12 x 4 + FE	
<b>Scanning range</b>			
		<b>Minimum</b>	0 m ... 4 m
		<b>Typically</b>	0 m ... 5 m

■ Resolution 14 mm

F

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01214ABB03BB0	1206951
180 mm		C4MT-01814ABB03BB0	1206945
240 mm	350 mm	C4MT-02414ABB03DB0	1206954
300 mm		C4MT-03014ABB03DB0	1206953
360 mm		C4MT-03614ABB03DB0	1206955
420 mm		C4MT-04214ABB03DB0	1206956
480 mm		C4MT-04814ABB03DB0	1206957
540 mm		C4MT-05414ABB03DB0	1206958
600 mm	700 mm	C4MT-06014ABB03FB0	1206959
660 mm		C4MT-06614ABB03FB0	1206960
720 mm		C4MT-07214ABB03FB0	1206961
780 mm		C4MT-07814ABB03FB0	1206962
840 mm		C4MT-08414ABB03FB0	1206963
900 mm		C4MT-09014ABB03FB0	1206964
960 mm		C4MT-09614ABB03FB0	1206965
1020 mm		C4MT-10214ABB03FB0	1206966
1080 mm		C4MT-10814ABB03FB0	1206967
1140 mm		C4MT-11414ABB03FB0	1206968
1200 mm	C4MT-12014ABB03FB0	1206969	

## ■ Resolution 24 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01224ABB03BBO	1207318
180 mm		C4MT-01824ABB03BBO	1207177
240 mm	350 mm	C4MT-02424ABB03DBO	1207319
300 mm		C4MT-03024ABB03DBO	1207320
360 mm		C4MT-03624ABB03DBO	1207321
420 mm		C4MT-04224ABB03DBO	1207322
480 mm		C4MT-04824ABB03DBO	1207178
540 mm		C4MT-05424ABB03DBO	1207323
600 mm		C4MT-06024ABB03FBO	1207324
660 mm	700 mm	C4MT-06624ABB03FBO	1207325
720 mm		C4MT-07224ABB03FBO	1207326
780 mm		C4MT-07824ABB03FBO	1207327
840 mm		C4MT-08424ABB03FBO	1207328
900 mm		C4MT-09024ABB03FBO	1207329
960 mm		C4MT-09624ABB03FBO	1207330
1020 mm		C4MT-10224ABB03FBO	1207331
1080 mm		C4MT-10824ABB03FBO	1207332
1140 mm		C4MT-11424ABB03FBO	1207180
1200 mm		C4MT-12024ABB03FBO	1207333

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## ■ Resolution 34 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C4MT-01234ABB03BBO	1207334
180 mm		C4MT-01834ABB03BBO	1207335
240 mm	350 mm	C4MT-02434ABB03DBO	1207336
300 mm		C4MT-03034ABB03DBO	1207337
360 mm		C4MT-03634ABB03DBO	1207338
420 mm		C4MT-04234ABB03DBO	1207339
480 mm		C4MT-04834ABB03DBO	1207340
540 mm		C4MT-05434ABB03DBO	1207341
600 mm		C4MT-06034ABB03FBO	1207342
660 mm	700 mm	C4MT-06634ABB03FBO	1207343
720 mm		C4MT-07234ABB03FBO	1207344
780 mm		C4MT-07834ABB03FBO	1207345
840 mm		C4MT-08434ABB03FBO	1207346
900 mm		C4MT-09034ABB03FBO	1207347
960 mm		C4MT-09634ABB03FBO	1207348
1020 mm		C4MT-10234ABB03FBO	1207349
1080 mm		C4MT-10834ABB03FBO	1207350
1140 mm		C4MT-11434ABB03FBO	1207351
1200 mm		C4MT-12034ABB03FBO	1207169

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Scanning range	Minimum	0 m ... 4 m
	Typically	0 m ... 5 m
Protective field height (depending on type)		120 mm ... 1200 mm
Safety related parameters	Type	Type 4 (IEC 61496)
	Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)
	Category	Category 4 (EN ISO 13849)
	Performance level	PL e (EN ISO 13849)
	PFHd (mean probability of a dangerous failure per hour)	Standalone system: $4.3 \times 10^{-9}$ (EN ISO 13849) Cascaded systems: $1.3 \times 10^{-8}$ (EN ISO 13849)
	$T_M$ (Mission Time)	20 years (EN ISO 13849)
Response time (depending on type)		Max. 17 ms <sup>1)</sup>
Synchronization		Optical, without separate synchronization
Protection class		III (EN 61140)
Enclosure rating		IP 65
Ambient operating temperature from ... to		-20 °C ... +55 °C
Storage temperature from ... to		-25 °C ... +70 °C
Air humidity from ... to		15 % ... 95 %, non-condensing
Housing cross-section (incl. system connection)		15 mm x 32 mm
Vibration resistance		5 g (10 Hz ... 55 Hz), IEC 60068-2-6
Shock resistance		10 g, 16 s (IEC 60068-2-29)

<sup>1)</sup> Standalone devices, no cascaded systems. Other response times, see operating instructions.

### Functional data

Restart interlock	✓
External device monitoring	✓
Beam coding	Automatic
Extension connection (depending on type)	✓
Configuration method	Hard wired

### Electrical data

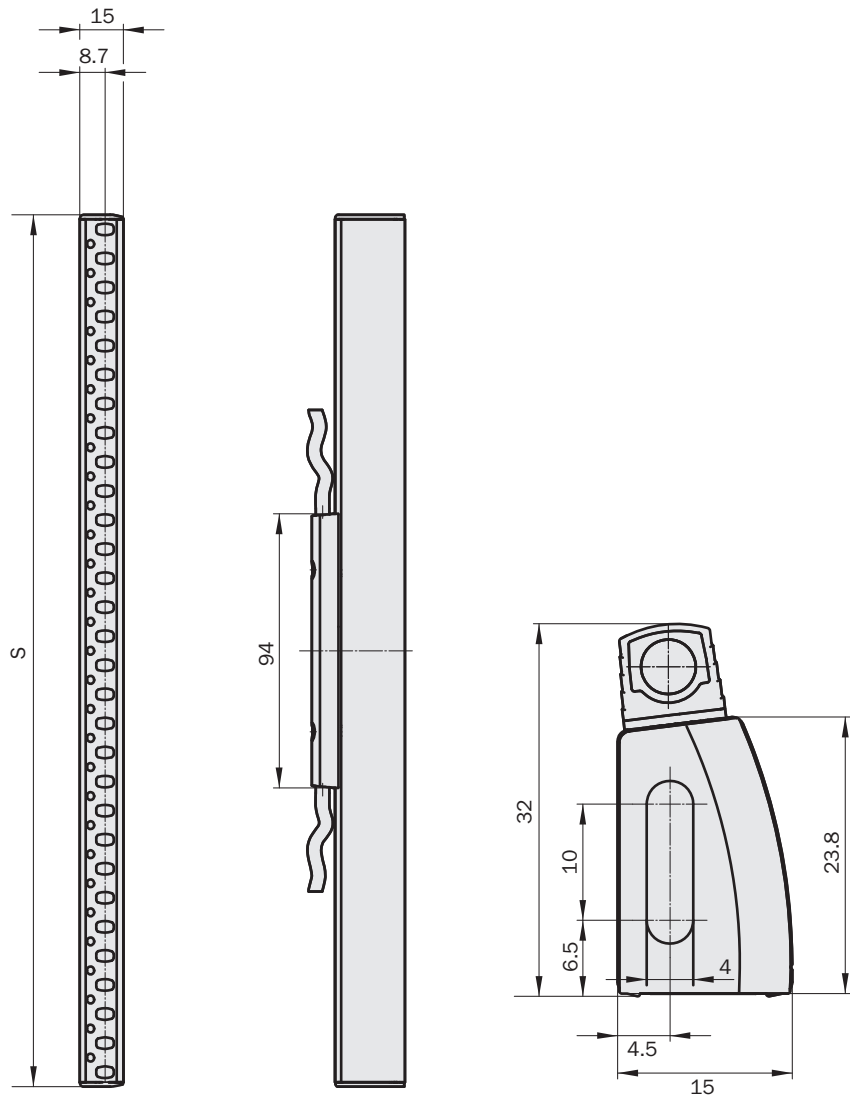
System connection	Plug M12 x 4 + FE
Connecting cable length	Max. 20 m <sup>1)</sup>
Connecting cable wire cross-section	0.34 mm <sup>2</sup>
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC)
Residual ripple	± 10 %
Switch-on time	Max. 3 s <sup>2)</sup>
Display elements	LED

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> After applying the supply voltage

## Dimensional drawings

### miniTwin4



S = protective field height = housing length

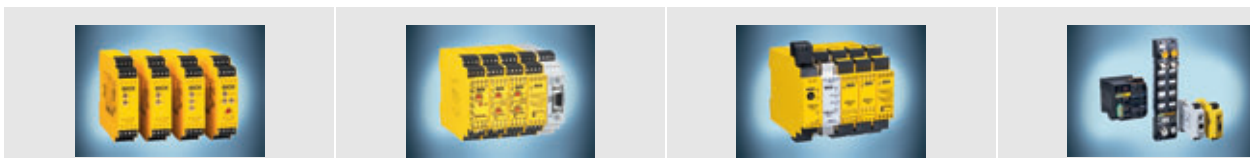
Dimensions in mm

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## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)

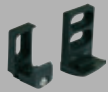


## sens:Control – safe control solutions



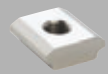
Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories




### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Combination C-Fix bracket with L-Fix bracket	2	BEF-3AAA0MKU2S04	2045843
	O-Fix bracket	2	BEF-3SHAEMKU2	2045835
	C-Fix-Flex bracket, adjustable +4°/-4°, metal version, for flat and connector side assembly	2	BEF-1SHABMAL2	2056598


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts for deflector mirror	Suitable for PNS75 and PNS125	6	2030600


### System plugs

Figure	Description	Cable length	Type	Part no.
	With 1 connecting cable, stripped	10 m	Standalone system plug	2051290
	With 1 connecting cable and plug M12 x 4 + FE	160 mm	Standalone system plug	2046447
		350 mm	Standalone system plug	2046449
		700 mm	Standalone system plug	2046451
	With 2 connecting cables and 1 plug and 1 socket M12 x 4 + FE	160 mm	Cascade system plug	2046452
		350 mm	Cascade system plug	2046454
		700 mm	Cascade system plug	2046456

### Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 5	Straight	2 m	DOL-1205-G02M	6008899
			5 m	DOL-1205-G05M	6009868
			10 m	DOL-1205-G10M	6010544
			15 m	DOL-1205-G15M	6029215
			20 m	DOL-1205-G20MAC	6036386

### Connector


Figure	Connection type	Direction of cable outlet	Type	Part no.
	Plug M12 x 5	Straight	STE-1205-G	6022083

### Cable receptacles


Connection type	Direction of cable outlet	Type	Part no.
Socket M12 x 5	Straight	DOS-1205-G	6009719



## Extension connection cables


Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Plug M12 x 5, socket M12 x 5	Plug straight/ socket straight	1 m	DSL-1205-G01MC	6029280
			2 m	DSL-1205-G02MC	6025931

## Deflector mirrors PNS75


Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
		1800 mm	PNS75-184	1019424

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## Deflector mirrors PNS125

Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435

## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter AR60 for miniTwin	–	–	–	4064710

Device protection

Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	24 mm diameter	Test rod	2045592
	34 mm diameter	Test rod	2045593
	Test rod holder	BEF-3WNAAAAL1	2052249

Dimensional drawings mounting systems

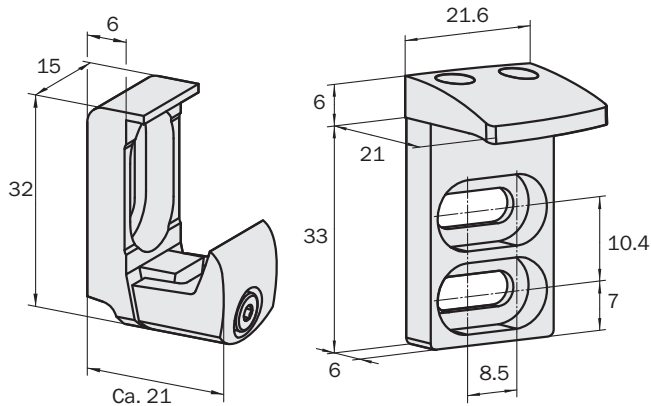
**BEF-3AAA0MKU2S04**

Combination C-Fix bracket with L-Fix bracket, 2 pieces each

**BEF-3SHAEMKU2**

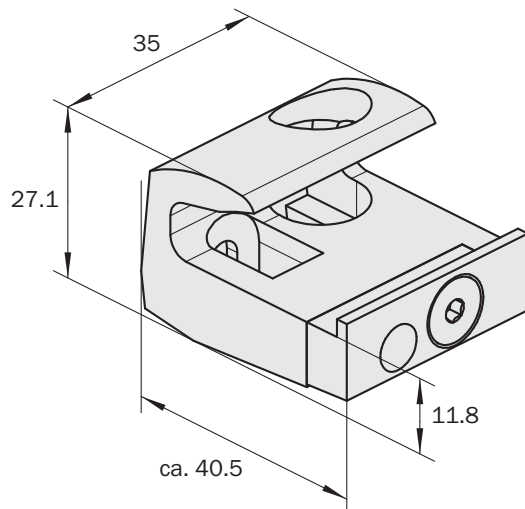
O-Fix bracket, 2 pieces

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**BEF-1SHABMAL2**

C-Fix-Flex bracket, adjustable +4°/-4°, metal version, for flat and connector side assembly



Dimensions in mm

## Technical data overview

Protective field height (depending on type)	150 mm ... 1200 mm
Scanning range (depending on type)	0 m ... 2.5 m / 0 m ... 6 m / 1 m ... 5 m
Resolution (depending on type)	14 mm / 30 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Micro safety light curtain is used wherever hazardous points and hazardous areas require reliable and cost-effective protection.

- Simplified machine integration in small spaces due to small, compact design
- Space-saving cable entry due to M12 connections

## In-system added value

Combined with SICK safe control solutions

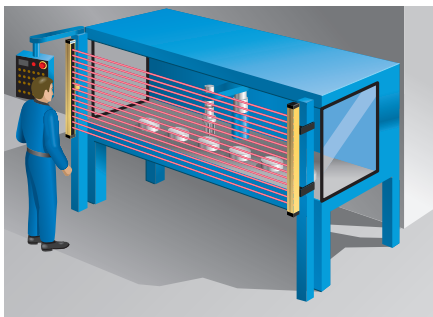
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

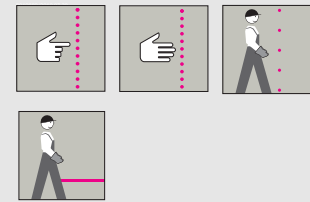
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Electronics industry
- Packaging machinery
- Food and beverage industry
- Handling machinery
- Special machinery



Hazardous point protection on a handling machine



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- Small, compact housing
- External device monitoring (EDM)
- Restart interlock (RES)



Further information	Page
→ Ordering information	F-118
→ Technical specifications	F-119
→ Dimensional drawings	F-120
→ Connection diagrams	F-121
→ Accessories	F-122
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C4000 Micro

Usage	As a standalone system
Connection types	System connection: plug M12 x 7 + FE

- Resolution: 14 mm
- Scanning range: 0 m ... 2.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C41S-0101AA300	1024054	C41E-0101AG300	1024055
300 mm	C41S-0301AA300	1023458	C41E-0301AG300	1023459
450 mm	C41S-0401AA300	1023460	C41E-0401AG300	1023461
600 mm	C41S-0601AA300	1023462	C41E-0601AG300	1023463
750 mm	C41S-0701AA300	1023464	C41E-0701AG300	1023465
900 mm	C41S-0901AA300	1023466	C41E-0901AG300	1023467
1050 mm	C41S-1001AA300	1023468	C41E-1001AG300	1023469
1200 mm	C41S-1201AA300	1023470	C41E-1201AG300	1023471

- Resolution: 14 mm
- Scanning range: 1 m ... 5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C41S-0101AA300	1024054	C41E-0101BG300	1024037
300 mm	C41S-0301AA300	1023458	C41E-0301BG300	1023486
450 mm	C41S-0401AA300	1023460	C41E-0401BG300	1023487
600 mm	C41S-0601AA300	1023462	C41E-0601BG300	1023488
750 mm	C41S-0701AA300	1023464	C41E-0701BG300	1023489
900 mm	C41S-0901AA300	1023466	C41E-0901BG300	1023490
1050 mm	C41S-1001AA300	1023468	C41E-1001BG300	1023491
1200 mm	C41S-1201AA300	1023470	C41E-1201BG300	1023492

- Resolution: 30 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C41S-0103AA300	1023563	C41E-0103AG300	1023860
300 mm	C41S-0303AA300	1023472	C41E-0303AG300	1023473
450 mm	C41S-0403AA300	1023474	C41E-0403AG300	1023475
600 mm	C41S-0603AA300	1023476	C41E-0603AG300	1023477
750 mm	C41S-0703AA300	1023478	C41E-0703AG300	1023479
900 mm	C41S-0903AA300	1023480	C41E-0903AG300	1023481
1050 mm	C41S-1003AA300	1023482	C41E-1003AG300	1023483
1200 mm	C41S-1203AA300	1023484	C41E-1203AG300	1023485

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Scanning range (depending on type)	-	0 m ... 2.5 m / 0 m ... 6 m / 1 m ... 5 m
Protective field height (depending on type)	150 mm ... 1200 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 20 ms
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	33.5 mm x 28.5 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

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### Functional data

System part	Sender	Receiver
Restart interlock	-	✓
Restart interlock (delivery status)	-	Internal
External device monitoring	-	✓
External device monitoring (delivery status)	-	Deactivated
Configuration method	Hard wired	

### Electrical data

System part	Sender	Receiver
System connection	Plug M12 x 7 + FE	
Connecting cable length	Max. 15 m <sup>1)</sup>	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 10 % <sup>3)</sup>	
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	24 V DC (15 V DC ... 28.8 V DC)
Switching voltage LOW	-	2 V DC
Switching current	-	Max. 500 mA
Display elements	7-segment	

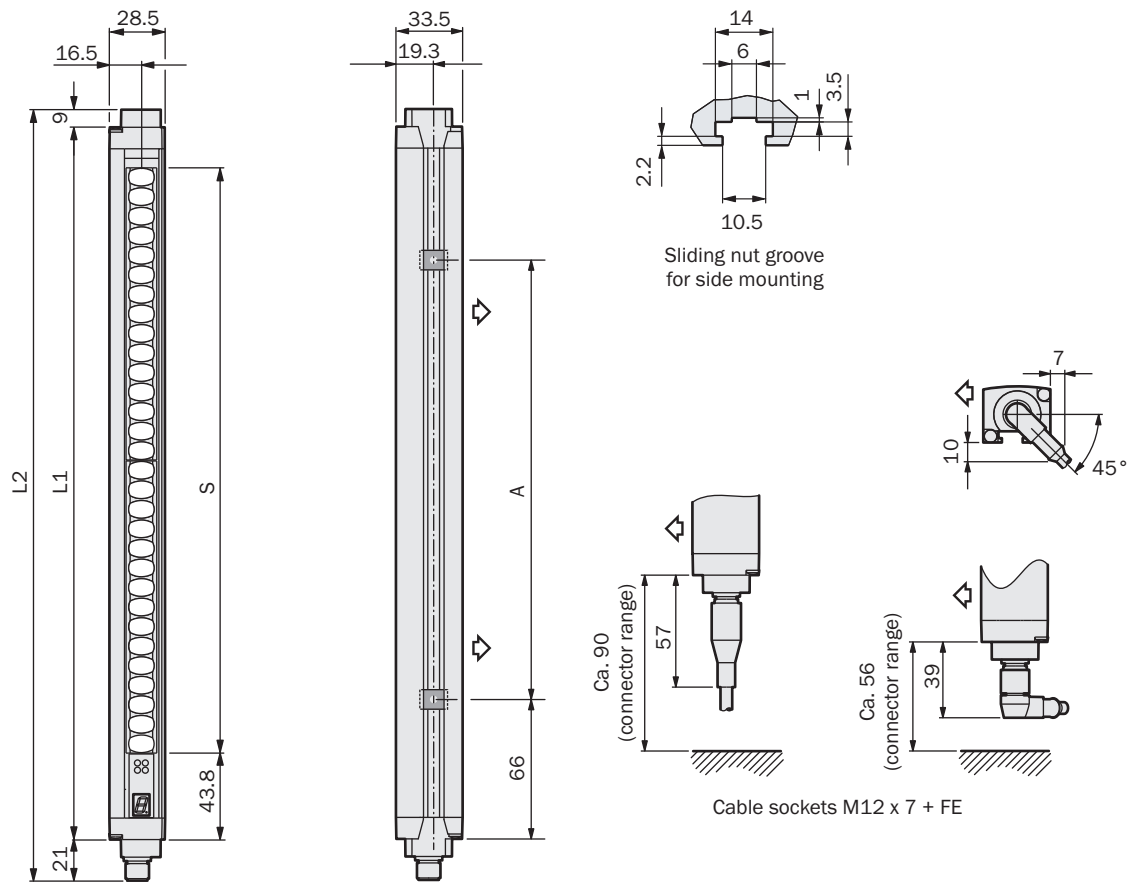
<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of V<sub>s</sub>.

# Dimensional drawings

## C4000 Micro



Plug M12 x 7 + FE

Illustration sender (receiver mirror image)

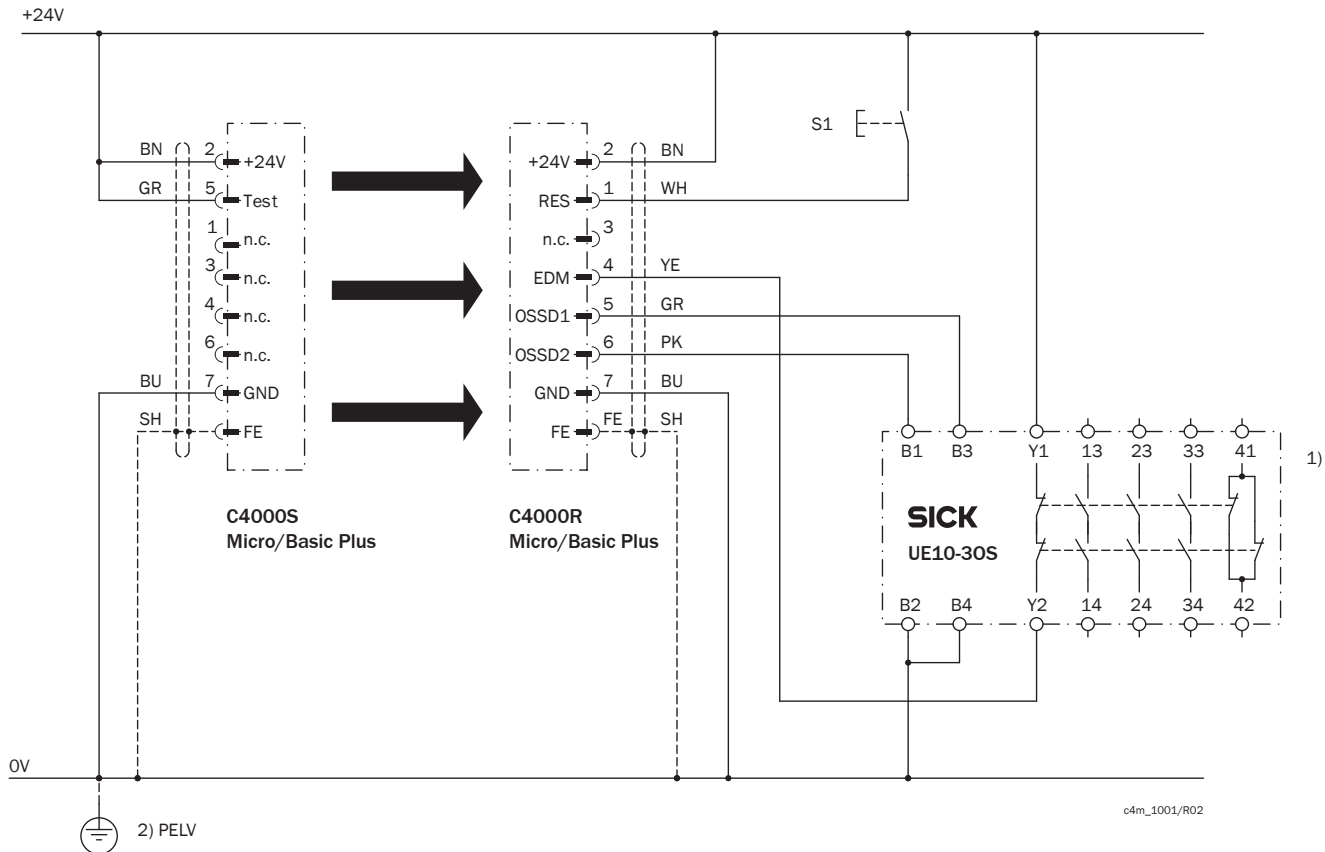
Protective field height S	L1	L2	A
150	246	276	106
300	364	394	224
450	515	545	374
600	666	696	524
750	816	846	674
900	967	997	824
1050	1117	1147	974
1200	1266	1296	1124

Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### C4000 Micro on UE10-30S safety relay



#### Task

Integration of a C4000 Micro/Basic Plus safety light curtain on UE10-30S.

Operating mode: with restart interlock and external device monitoring.

#### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the yellow LED on the receiver flashes. The system is ready to be switched on. The system is enabled by pressing S1 (button is pressed and released). The OSSD1 and OSSD2 outputs are live and the UE10-30S is switched on. Upon the interruption of one of the light beams, the UE10-30S is deactivated by the OSSD1 and OSSD2 outputs.

#### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The incorrect functioning of the UE10-30S will be detected but will not result in the loss of the shutdown function. On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits.

#### Comments

1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) PELV in accordance with the requirements in EN 60204-1 / 6.4 Take note of the operating instructions of the integrated devices.

## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories

### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting bracket, rigid	4	BEF-3WNKBAST4	2044068
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 1, swivel mount	4	BEF-2SMKEAKU4	2019649
	Stainless steel bracket, adjustable	4	BEF-2SMKEAES4	2030288
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMKEAAL4	2044848
	Mounting kit 10, replacement bracket, suitable for replacement of FGS	4	BEF-3WNKBCST4	2021645



### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


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## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
	Socket M12 x 7 + FE	Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343


## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	M12 x 8	Straight	DOS-1208-G	6028422

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves

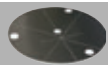



Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

## Mirror columns with protective field height mirror

Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0


## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMKEAAL2	2045884
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938


## Additional front screens

Figure	Suitable for protective field height	Part no.
 Example of use	150 mm	2022404
	300 mm	2022405
	450 mm	2022406
	600 mm	2022407
	750 mm	2022408
	900 mm	2022409
	1050 mm	2022410
	1200 mm	2022411

## PNS75 deflector mirrors



Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
			1800 mm	PNS75-184

## PNS125 deflector mirrors


Figure	Mirror material	Suitable for protective field height	Type	Part no.		
	Glass	300 mm	PNS125-034	1019425		
		450 mm	PNS125-049	1019426		
		600 mm	PNS125-064	1019427		
		750 mm	PNS125-079	1019428		
		900 mm	PNS125-094	1019429		
		1050 mm	PNS125-109	1019430		
		1200 mm	PNS125-124	1019431		
		1350 mm	PNS125-139	1019432		
		1500 mm	PNS125-154	1019433		
		1650 mm	PNS125-169	1019434		
				1800 mm	PNS125-184	1019435

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## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for small housing profile	-	-	-	4032462
	Adapter for AR60, for small housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056730



## Configuration software

Figure	Description	Remark	Part no.
	CD ROM operating instructions for C4000 Basic Plus, C4000 Basic, C4000 Eco, C4000 Micro	Included with delivery	2026783

**Configuration tools**

Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103
	Adapter cable for reset tool	C4000 Basic Plus and C4000 Micro in combination with reset tool (6022103)	Adapter cable for reset tool	2026866

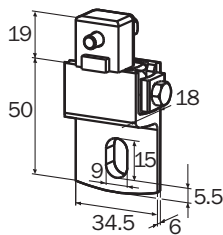
**Device protection**

Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAAL1	2052249

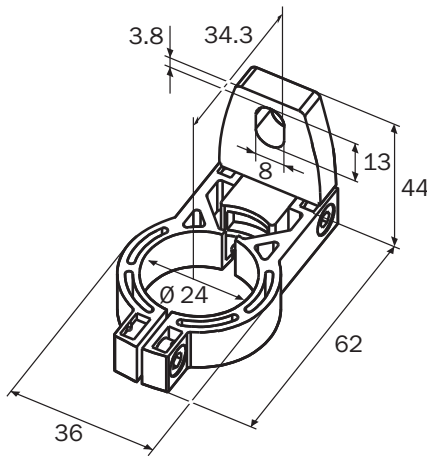
F

**Dimensional drawings mounting systems**

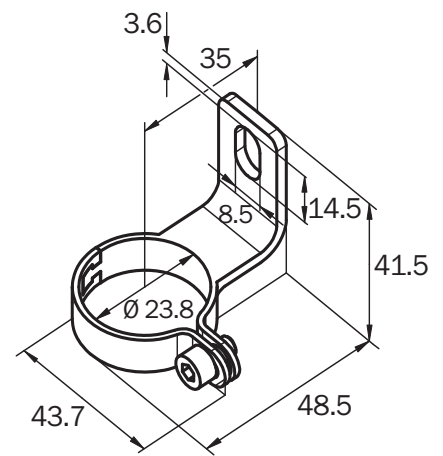
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



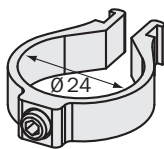
**BEF-2SMKEAKU4**  
Mounting kit 1, swivel mount



**BEF-2SMKEAES4**  
Stainless steel bracket, adjustable

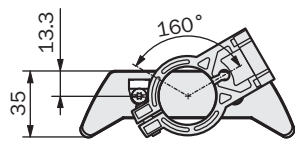


**BEF-2SMKEAAL4**  
Omega bracket, flexible and quick installation with only one screw

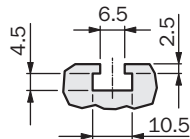


Dimensions in mm

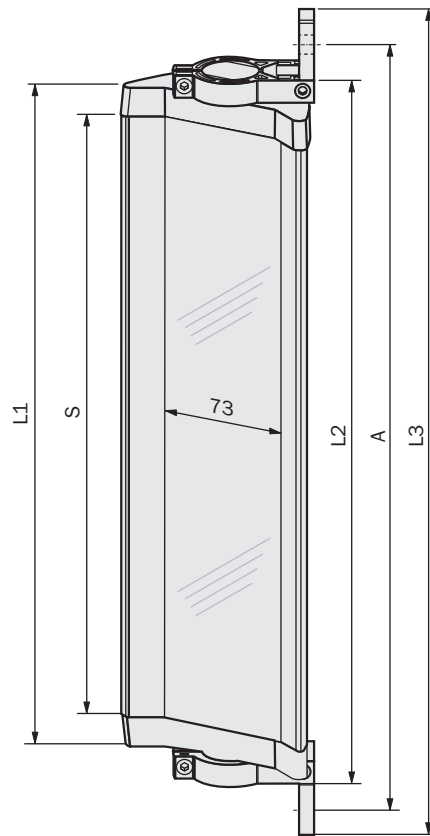
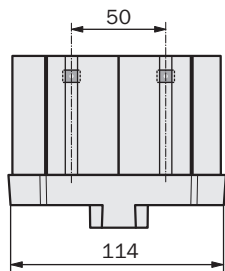
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

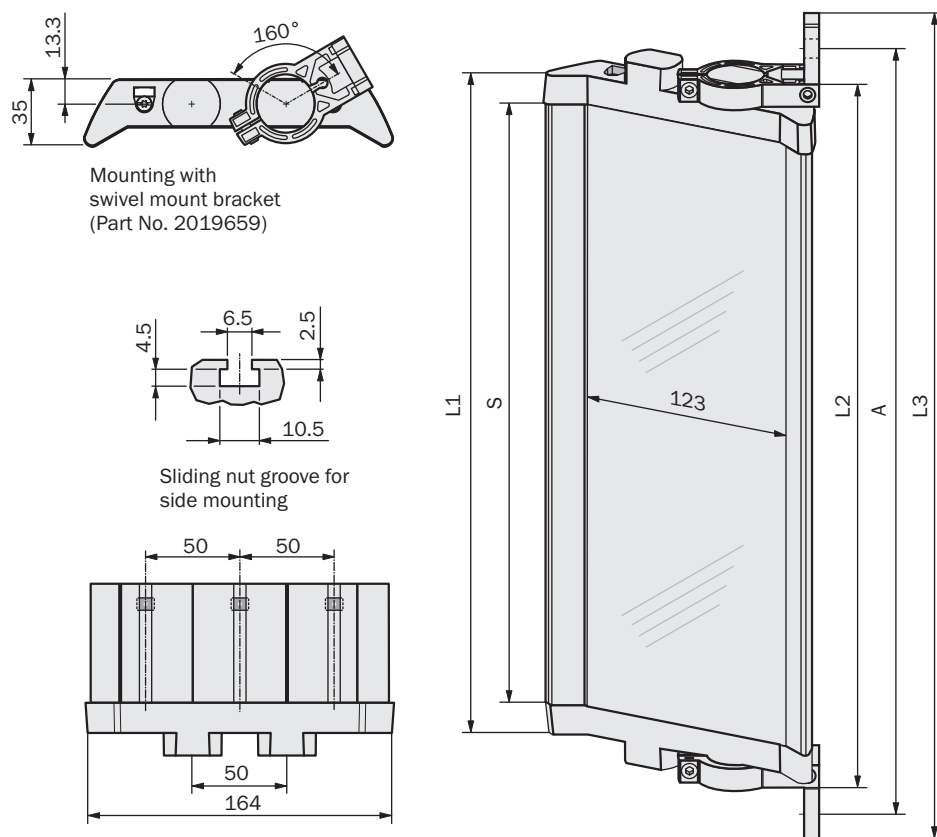


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

## Technical data overview

Resistant materials	Stainless steel V4A, PMMA, PA 6
Enclosure rating	IP 69K, IP 67, IP 66, IP 65
Protective field height (depending on type)	150 mm ... 1200 mm
Scanning range (depending on type)	0 m ... 1.8 m / 0 m ... 4.5 m / 1 m ... 4 m
Resolution (depending on type)	14 mm / 30 mm
Type	Type 4 (IEC 61496-1) Type 2 (IEC 61496-2)

## Product description

The IP69K Housing, in conjunction with the C4000 Micro safety light curtain, achieves an IP 69K enclosure rating. A high level of resistance against the usual cleaning agents is achieved by using suitable materials (V4A, PMMA, PA, PVC).

A compensating element (membrane) prevents the plastic tubes from misting up and liquids from entering the housing. The cable is fed into the device through the proven PG connector.

## In-system added value

Combined with SICK safe control solutions

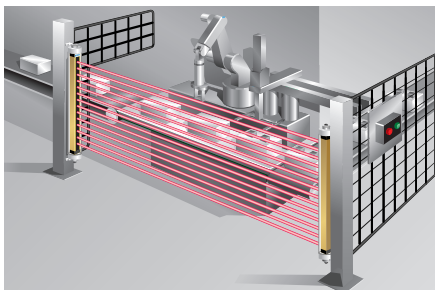
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

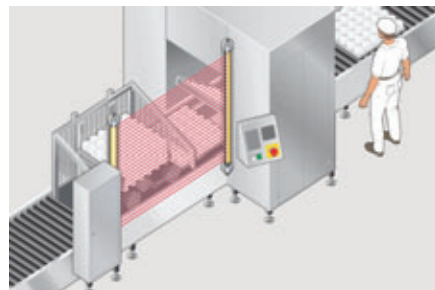
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

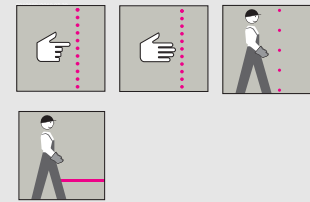
- Packaging industry
- Pharmaceutical industry
- Food industry
- Clean room systems
- Chemical industry



Hazardous point protection on a machining center in the hygiene area



Hazardous point protection on a cheese-making machine



- Enclosure ratings IP 69K, IP 67 and IP 66
- Resistant to wash down pressures up to 100 bar and wash down temperatures up to 80 °C
- ECOLAB and Diversey cleaning certificates
- Compact design in 50 mm acrylic tube with high hygiene and cleaning standards
- Chemical-resistant materials: stainless steel end caps, PMMA tube, PA membrane
- IP 69K-rated PVC cable and screw fitting
- Stainless steel brackets



Further information	Page
→ Ordering information	F-130
→ Technical specifications	F-131
→ Dimensional drawings	F-132
→ Accessories	F-133
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

IP69K Housing with integrated C4000 Micro sender or receiver unit,  
including 15 m IP 69K-rated PVC cable

- Resolution: 14 mm
- Scanning range: 0 m ... 1.8 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C45S-0101AA220	1025720	C45E-0101AG220	1025721
300 mm	C45S-0301AA220	1025722	C45E-0301AG220	1025723
450 mm	C45S-0401AA220	1025727	C45E-0401AG220	1025728
600 mm	C45S-0601AA220	1025732	C45E-0601AG220	1025733
750 mm	C45S-0701AA220	1025737	C45E-0701AG220	1025738
900 mm	C45S-0901AA220	1025742	C45E-0901AG220	1025743
1050 mm	C45S-1001AA220	1025747	C45E-1001AG220	1025748
1200 mm	C45S-1201AA220	1025753	C45E-1201AG220	1025754

- Resolution: 14 mm
- Scanning range: 1 m ... 4 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C45S-0101AA220	1025720	C45E-0101BG220	1025719
300 mm	C45S-0301AA220	1025722	C45E-0301BG220	1025726
450 mm	C45S-0401AA220	1025727	C45E-0401BG220	1025731
600 mm	C45S-0601AA220	1025732	C45E-0601AG220	1025736
750 mm	C45S-0701AA220	1025737	C45E-0701BG220	1025741
900 mm	C45S-0901AA220	1025742	C45E-0901BG220	1025746
1050 mm	C45S-1001AA220	1025747	C45E-1001BG220	1025752
1200 mm	C45S-1201AA220	1025753	C45E-1201BG220	1025757

- Resolution: 30 mm
- Scanning range: 0 m ... 4.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C45S-0103AA220	1025717	C45E-0103AG220	1025718
300 mm	C45S-0303AA220	1025724	C45E-0303AG220	1025725
450 mm	C45S-0403AA220	1025729	C45E-0403AG220	1025730
600 mm	C45S-0603AA220	1025734	C45E-0603AG220	1025735
750 mm	C45S-0703AA220	1025739	C45E-0703AG220	1025740
900 mm	C45S-0903AA220	1025744	C45E-0903AG220	1025745
1050 mm	C45S-1003AA220	1025749	C45E-1003AG220	1025750
1200 mm	C45S-1203AA220	1025755	C45E-1203AG220	1025756



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Scanning range (depending on type)	-	0 m ... 1.8 m / 0 m ... 4.5 m / 1 m ... 4 m
Protective field height (depending on type)	150 mm ... 1200 mm	
Safety related parameters		
Type	Type 4 (IEC 61496-1) Type 2 (IEC 61496-2)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (EN 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 20 ms
Synchronization	Optical, without separate synchronization	
Protection class	III (IEC 536:1976)	
Enclosure rating	IP 69K, IP 67, IP 66, IP 65	
Materials		
End caps	Stainless steel V4A	
Plastic tube	PMMA	
Compensating element (membrane)	PA 6	
PG connector	PA 6	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing diameter	52 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

### Functional data

System part	Sender	Receiver
Restart interlock	-	✓
External device monitoring	-	✓
Configuration method	Hard wired	

Electrical data

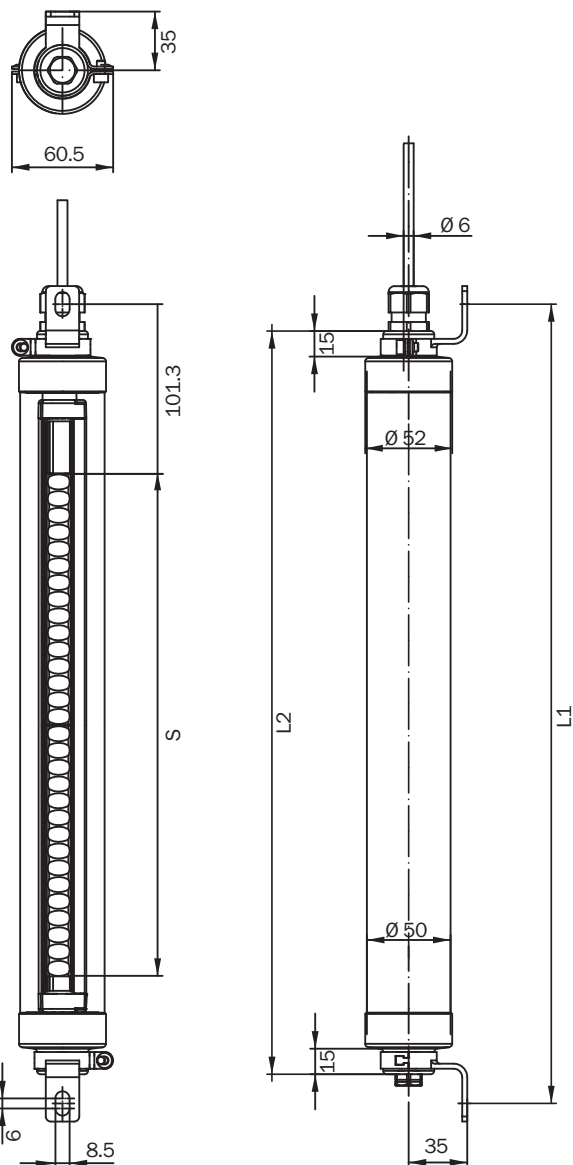
System part	Sender	Receiver
System connection	PVC cable, 15 m	
Supply voltage $V_s$	24 V DC (19 V DC ... 28 V DC)	
Residual ripple	$\leq 10\% \text{ } ^1$	
Power consumption	Max. 350 mA	Max. 450 mA
Safety outputs (OSSD)	2 PNP semiconductors, short-circuit protected, cross-circuit monitored	
Type of output	-	24 V DC (15 V DC ... 28.8 V DC)
Switching voltage HIGH	-	2 V DC
Switching voltage LOW	-	Max. 500 mA
Switching current	-	
Display elements	7-segment	

<sup>1)</sup> Within the limits of  $V_s$ .

Dimensional drawings



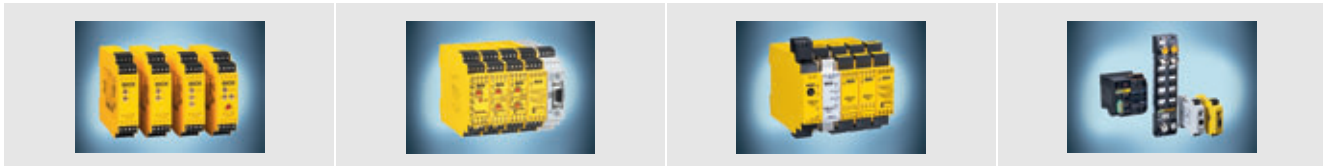
C4000 Micro in IP69K Housing



Protective field height S	L1	L2
150	357	324
300	476	443
450	626	593
600	777	744
750	927	894
900	1078	1045
1050	1228	1195
1200	1382	1349

Dimensions in mm

## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Stainless steel support bracket	2	BEF-2AAAADES2	2026849
	Venting membrane	–	Venting membrane	5309082
	For M12 cable socket	–	Assembly key	4034690


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600



### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

**Deflector mirrors**

Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Stainless steel	750 mm	PNS75-079S05	1046075

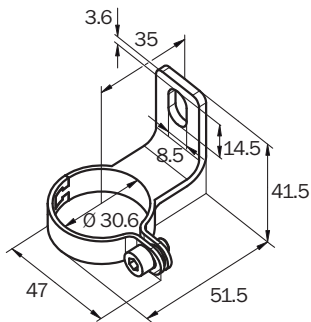
**Device protection**

Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

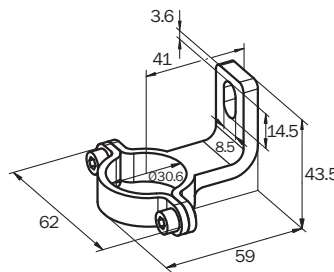
F

**Dimensional drawings mounting systems**

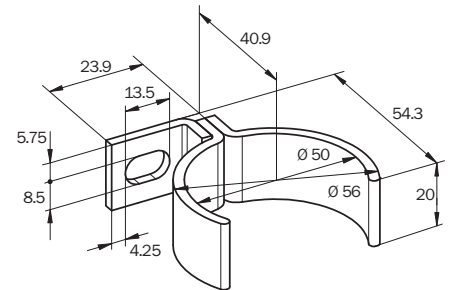
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable

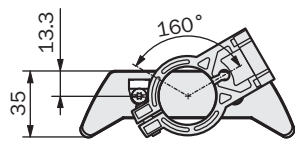


**BEF-2AAADES2**  
Stainless steel support bracket

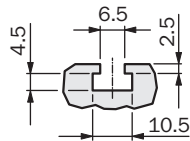


Dimensions in mm

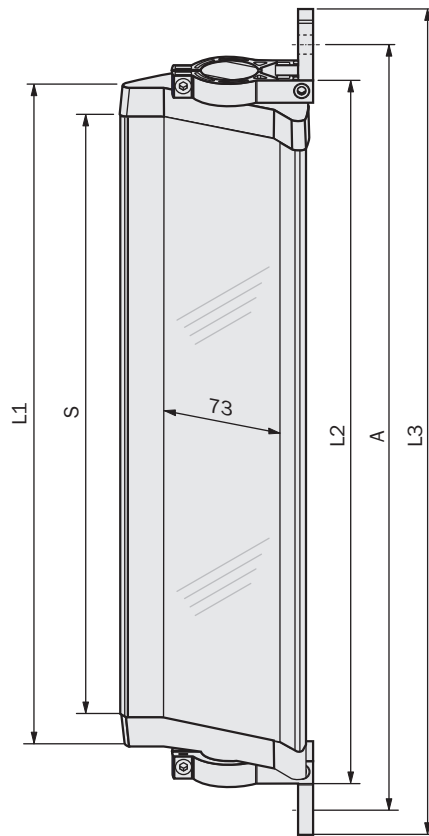
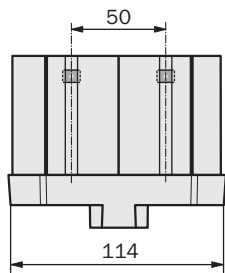
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting



Mirror height S	L1	L2	L3	A
790	822	846	910	890

Dimensions in mm

F



F

- Ambient operating temperature down to -30 °C
- High durability
- Compact design
- On-site diagnostics
- External device monitoring (EDM)
- Restart interlock (RES)



## Technical data overview

Ambient operating temperature	-30 °C ... +15 °C
Resistant materials	Stainless steel, PMMA, PA 6
Enclosure rating	IP 67
Protective field height (depending on type)	600 mm / 1050 mm / 1200 mm
Scanning range (depending on type)	0 m ... 4.5 m / 1 m ... 4 m
Resolution (depending on type)	14 mm / 30 mm
Type	Type 4 (IEC 61496-1) Type 2 (IEC 61496-2)

## Product description

The robust IP 67 Housing and the integrated heating transform the C4000 Micro safety light curtain into the Cold Store Curtain, making it equipped for use at low temperatures. It is therefore now possible to provide more flexible, ergonomic and process-oriented protection of access and hazardous points-of-operation in deep-freeze areas than would be achieved with

separate protective equipment such as grids or fences.

In deep-freeze distribution centers, in particular, it is important that customer-specific batch sizes are rapidly and smoothly picked.

The protection of picking places with Cold Store Curtains ensures flexible and rapid access to automatic pallet stores.

## In-system added value

Combined with SICK safe control solutions

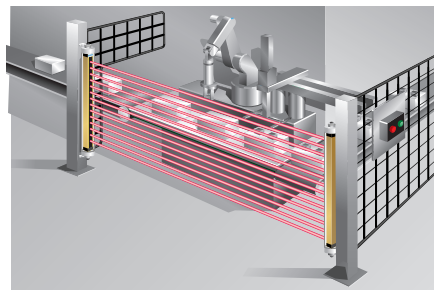
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	O-2
Flexi Soft	✓	✓	✓	O-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Hazardous point protection and access protection in cold storage and in industries such as:
- Food industry
  - Logistics



Hazardous point protection on a machining center in the hygiene area

Further information	Page
→ Dimensional drawings	F-139
→ Accessories	F-140
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

**Note:** Other resolutions and protective field heights available upon request.

### C4000 Micro Cold Store

- Resolution: 14 mm
- Scanning range: 1 m ... 4 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
600 mm	C45S-S007	1041165	C45E-S007	1041166

- Resolution: 30 mm
- Scanning range: 0 m ... 4.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
1050 mm	C45S-S012	1045693	C45E-S012	1045694
1200 mm	C45S-S016	1048528	C45E-S016	1048529

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Scanning range (depending on type)	-	0 m ... 4.5 m / 1 m ... 4 m
Protective field height (depending on type)	600 mm / 1050 mm / 1200 mm	
Safety related parameters		
Type	Type 4 (IEC 61496-1) Type 2 (IEC 61496-2)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (EN 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$3.2 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 14 ms
Synchronization	Optical, without separate synchronization	
Protection class	III (IEC 536:1976)	
Enclosure rating	IP 67	
Materials		
End caps	Stainless steel	
Plastic tube	PMMA	
Compensating element (membrane)	PA 6	
PG connector	PA 6	
Ambient operating temperature from ... to	0 °C ... +55 °C -30 °C ... +15 °C with heating switched on	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing diameter	52 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

## Functional data

System part	Sender	Receiver
Restart interlock	-	✓
Restart interlock (delivery status)	-	Internal
External device monitoring	-	✓
External device monitoring (delivery status)	-	Deactivated
Configuration method	Hard wired	

## Electrical data

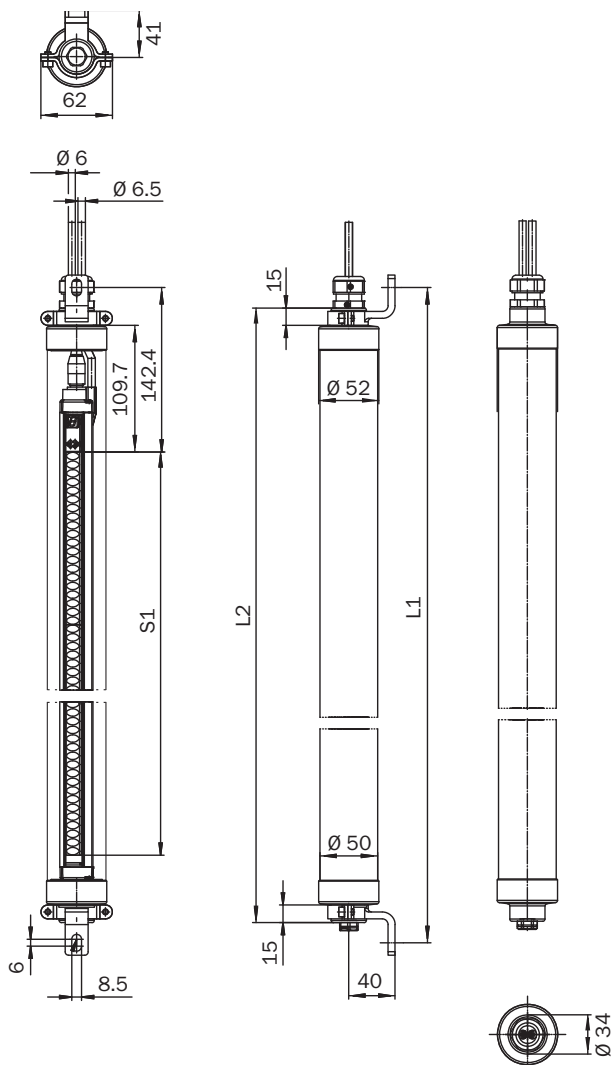
System part	Sender	Receiver
System connection	PVC cable, 15 m	
Connecting cable wire cross-section sensor	0.25 mm <sup>2</sup>	
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC)	
Residual ripple	≤ 10 % <sup>1)</sup>	
Power consumption	Max. 350 mA	Max. 450 mA
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	24 V DC (15 V DC ... 28.8 V DC)
Switching voltage LOW	-	2 V DC
Switching current	-	Max. 500 mA
Heating		
Supply voltage	230 V AC	
Power consumption (temperature)	Max. 70 W (-30 °C)	
Short-circuit protection	6 A circuit breaker, type C	
Trip current earth leakage trip	30 mA	
Connecting cable wire cross-section heating	3 x 0.75 mm <sup>2</sup>	
Display elements	7-segment	

<sup>1)</sup> Within the limits of  $V_s$ .

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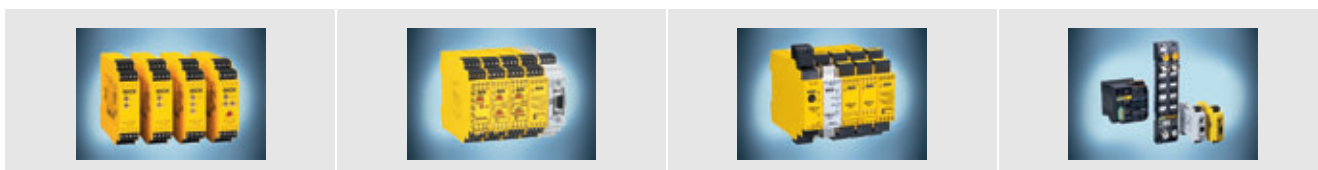
## Dimensional drawings



Protective field height S	L1	L2
600	817	782
1050	1267	1232
1200	1422	1387

Dimensions in mm

## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Description	Packing unit	Type	Part no.
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Stainless steel support bracket	2	BEF-2AAAADES2	2026849
	Venting membrane	-	Venting membrane	5309082
	For M12 cable socket	-	Assembly key	4034690

### Power supply units

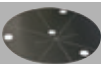


Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

### Device columns with external grooves



Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

→ For more detailed data on device columns, see page I-0

**Column parts and accessories**

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAAL2	2045883

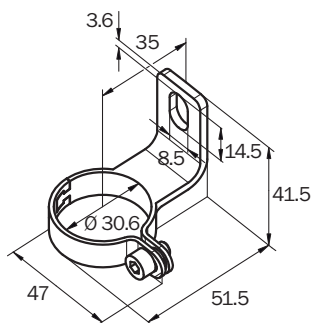
**Device protection**

Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

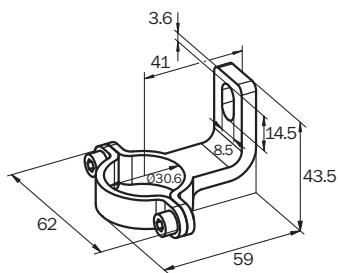
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**Dimensional drawings mounting systems**

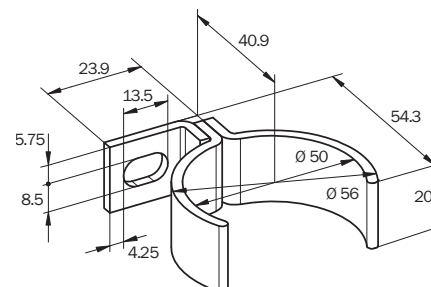
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



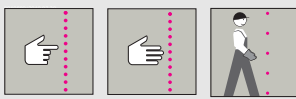
**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2AAADES2**  
Stainless steel support bracket



Dimensions in mm



F

- 7-segment display + LED
- Restart interlock (RES)
- External device monitoring (EDM)
- Pre-assembled M12 cables



## Technical data overview

Protective field height (depending on type)	300 mm ... 1800 mm
Scanning range (depending on type)	0 m ... 2.5 m / 0 m ... 6 m / 1 m ... 5 m
Resolution (depending on type)	14 mm / 30 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Basic Plus safety light curtain provides cost-effective, reliable protection of hazardous points and hazardous areas. Pre-assembled "off-the-peg" M12 x 8 cables save money and integrated functions, such as restart interlock and external device monitoring, simplify machine integration. Alignment and diagnostics using the proven 7-segment display saves more time.

- Reduced replacement costs and time: Sender and receiver can be replaced separately.

- Security of investment due to high impact resistance and resistance of the front screen to scratches
- High system availability due to tested interaction between sensor and evaluation unit
- Space-saving and compact systems due to fast response times for low safety distances
- High availability even in harsh industrial conditions due to EMC immunity

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	O-2
Flexi Soft	✓	✓	✓	O-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

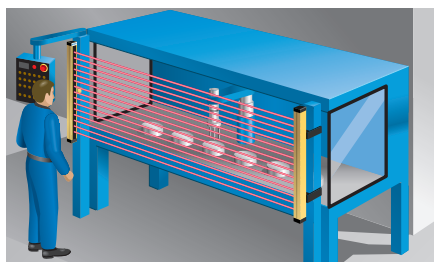
→ For more combinations, see annex

## Applications

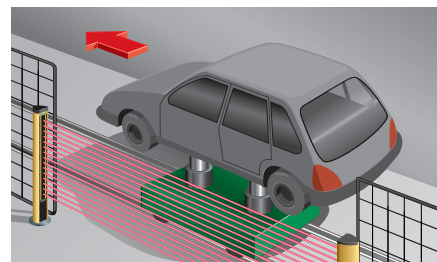
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Car and vehicle manufacture
- Machine tools
- Electronics industry
- Packaging machines
- Food and beverage industry
- Handling machines
- Special machine tool manufacturing
- Environmental engineering

Further information	Page
→ Technical specifications	F-144
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→ Connection diagrams	F-146
→ Accessories	F-147
→ Systematic safety	A-0
→ Services	B-0



Hazardous point protection on a handling machine



Hazardous point protection on an assembly line

## Ordering information

### C4000 Basic Plus

Usage	As a standalone system
Connection types	System connection: Plug M12 x 7 + FE

- Resolution: 14 mm
- Scanning range: 0 m ... 2.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301AA300	1027922	C40E-0301AG300	1027944
450 mm	C40S-0401AA300	1027923	C40E-0401AG300	1027945
600 mm	C40S-0601AA300	1027924	C40E-0601AG300	1027946
750 mm	C40S-0701AA300	1027925	C40E-0701AG300	1027947
900 mm	C40S-0901AA300	1027926	C40E-0901AG300	1027948
1050 mm	C40S-1001AA300	1027927	C40E-1001AG300	1027949
1200 mm	C40S-1201AA300	1027928	C40E-1201AG300	1027950
1350 mm	C40S-1301AA300	1027929	C40E-1301AG300	1027951
1500 mm	C40S-1501AA300	1027930	C40E-1501AG300	1027952
1650 mm	C40S-1601AA300	1027931	C40E-1601AG300	1027953
1800 mm	C40S-1801AA300	1027932	C40E-1801AG300	1027954

- Resolution: 14 mm
- Scanning range: 1 m ... 5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301AA300	1027922	C40E-0301BG300	1027966
450 mm	C40S-0401AA300	1027923	C40E-0401BG300	1027967
600 mm	C40S-0601AA300	1027924	C40E-0601BG300	1027968
750 mm	C40S-0701AA300	1027925	C40E-0701BG300	1027969
900 mm	C40S-0901AA300	1027926	C40E-0901BG300	1027970
1050 mm	C40S-1001AA300	1027927	C40E-1001BG300	1027971
1200 mm	C40S-1201AA300	1027928	C40E-1201BG300	1027972
1350 mm	C40S-1301AA300	1027929	C40E-1301BG300	1027973
1500 mm	C40S-1501AA300	1027930	C40E-1501BG300	1027974
1650 mm	C40S-1601AA300	1027931	C40E-1601BG300	1027975
1800 mm	C40S-1801AA300	1027932	C40E-1801BG300	1027976

- Resolution: 30 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303AA300	1027933	C40E-0303AG300	1027955
450 mm	C40S-0403AA300	1027934	C40E-0403AG300	1027956
600 mm	C40S-0603AA300	1027935	C40E-0603AG300	1027957
750 mm	C40S-0703AA300	1027936	C40E-0703AG300	1027958
900 mm	C40S-0903AA300	1027937	C40E-0903AG300	1027959
1050 mm	C40S-1003AA300	1027938	C40E-1003AG300	1027960
1200 mm	C40S-1203AA300	1027939	C40E-1203AG300	1027961
1350 mm	C40S-1303AA300	1027940	C40E-1303AG300	1027962
1500 mm	C40S-1503AA300	1027941	C40E-1503AG300	1027963
1650 mm	C40S-1603AA300	1027942	C40E-1603AG300	1027964
1800 mm	C40S-1803AA300	1027943	C40E-1803AG300	1027965

## F

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Scanning range (depending on type)	–	0 m ... 2.5 m / 0 m ... 6 m / 1 m ... 5 m
Protective field height (depending on type)	300 mm ... 1800 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	Max. 26 ms	
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	–25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

## Functional data

System part	Sender	Receiver
Restart interlock	-	✓
Restart interlock (delivery status)	-	Deactivated
External device monitoring	-	✓
External device monitoring (delivery status)	-	Deactivated
Configuration method	Hard wired	

## Electrical data

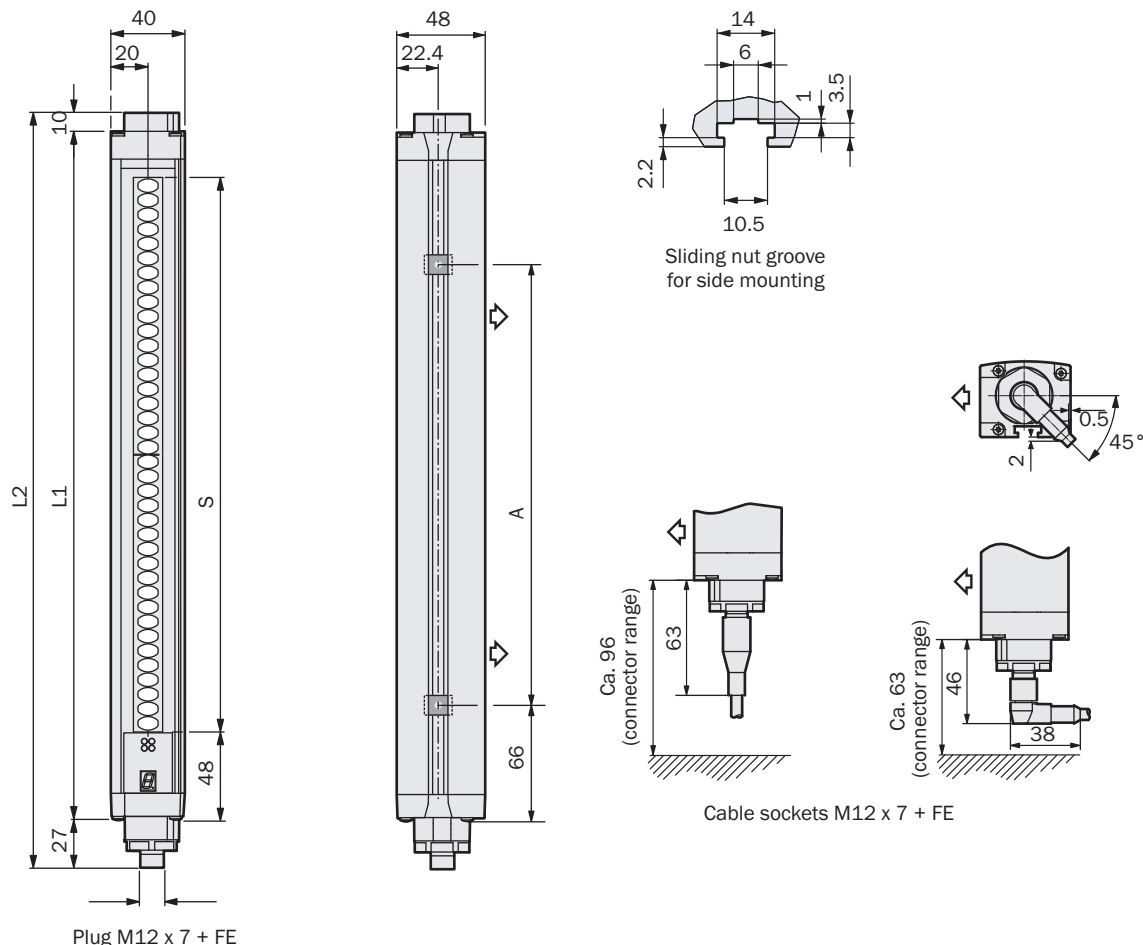
System part	Sender	Receiver
System connection	Plug M12 x 7 + FE	
Connecting cable length	Max. 15 m	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>1)</sup>	
Residual ripple	$\leq 10\%$ <sup>2)</sup>	
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	24 V DC (15 V DC ... 28.8 V DC)
Switching voltage LOW	-	2 V DC
Switching current	-	Max. 500 mA
Display elements	7-segment	

<sup>1)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>2)</sup> Within the limits of  $V_s$ .

# Dimensional drawings

## C4000 Basic Plus



Plug M12 x 7 + FE

Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	372	409	224
450	523	560	374
600	674	711	524
750	824	861	674
900	975	1012	824
1050	1125	1162	974
1200	1274	1311	1124
1350	1426	1463	1274
1500	1577	1614	1424
1650	1727	1764	1574
1800	1878	1915	1724

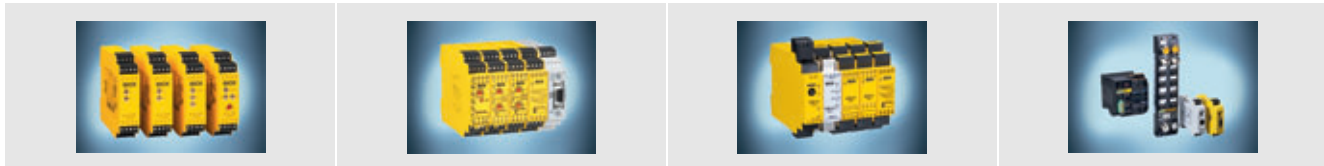
Dimensions in mm

# Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)












## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847
	Mounting kit 11, replacement bracket, suitable for replacement of FGS	4	BEF-3WNGBCST4	2021646


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
	Socket M12 x 7 + FE	Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343


## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	M12 x 8	Straight	DOS-1208-G	6028422

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves





Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external assembling grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

## Mirror columns with protective field height mirror

Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns see page I-0


## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938


## Additional front screens

Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2022412
	450 mm	2022413
	600 mm	2022414
	750 mm	2022415
	900 mm	2022416
	1050 mm	2022417
	1200 mm	2022418
	1350 mm	2022419
	1500 mm	2022420
	1650 mm	2022421
	1800 mm	2022422

## Additional heavy-duty front screens

Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2026853
	450 mm	2026854
	600 mm	2026855
	750 mm	2026856
	900 mm	2026857
	1050 mm	2026858
	1200 mm	2026859
	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863



## PNS75 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
			1800 mm	PNS75-184


## PNS125 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.		
	Glass	300 mm	PNS125-034	1019425		
		450 mm	PNS125-049	1019426		
		600 mm	PNS125-064	1019427		
		750 mm	PNS125-079	1019428		
		900 mm	PNS125-094	1019429		
		1050 mm	PNS125-109	1019430		
		1200 mm	PNS125-124	1019431		
		1350 mm	PNS125-139	1019432		
		1500 mm	PNS125-154	1019433		
		1650 mm	PNS125-169	1019434		
				1800 mm	PNS125-184	1019435



## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825); Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731



## Configuration software

Figure	Description	Remark	Part no.
	CD ROM operating instructions for C4000 Basic Plus, C4000 Basic, C4000 Eco, C4000 Micro	Included with delivery	2026783

**Configuration tools**

Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103
	Adapter cable for reset tool	C4000 Basic Plus and C4000 Micro in combination with reset tool (6022103)	Adapter cable for reset tool	2026866

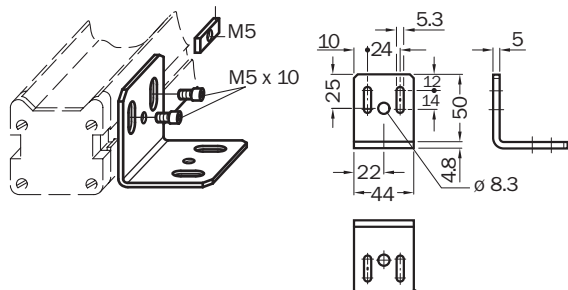
**Device protection**

Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

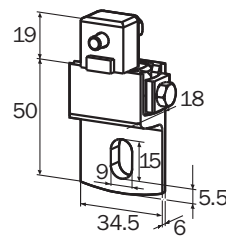
**F**

Dimensional drawings mounting systems

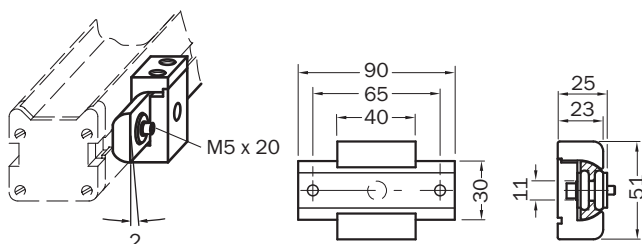
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



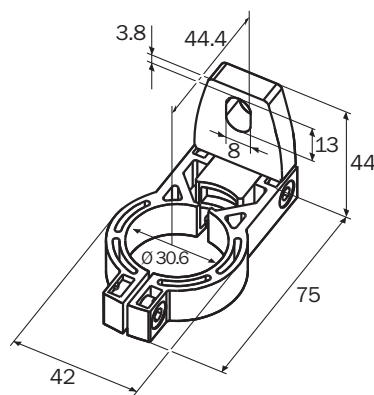
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



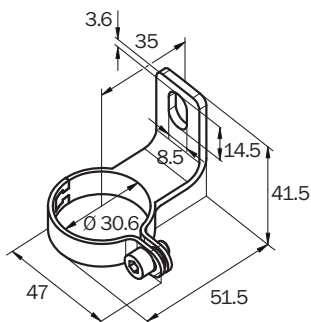
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



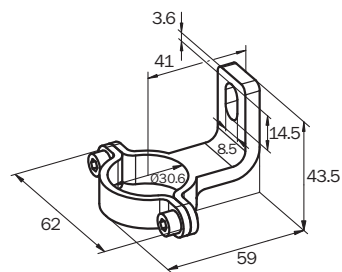
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



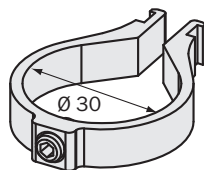
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



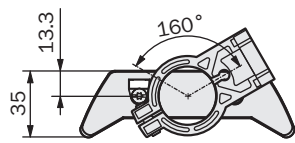
**BEF-2SMMEAAL4, BEF-2SMMEAAL2**  
Omega bracket, flexible and quick installation with only one screw



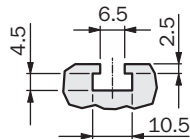
Dimensions in mm

F

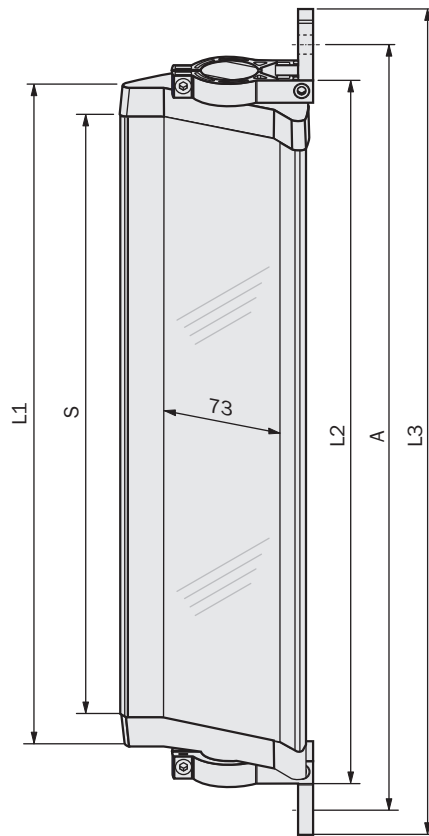
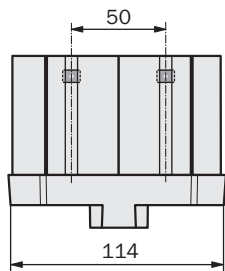
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

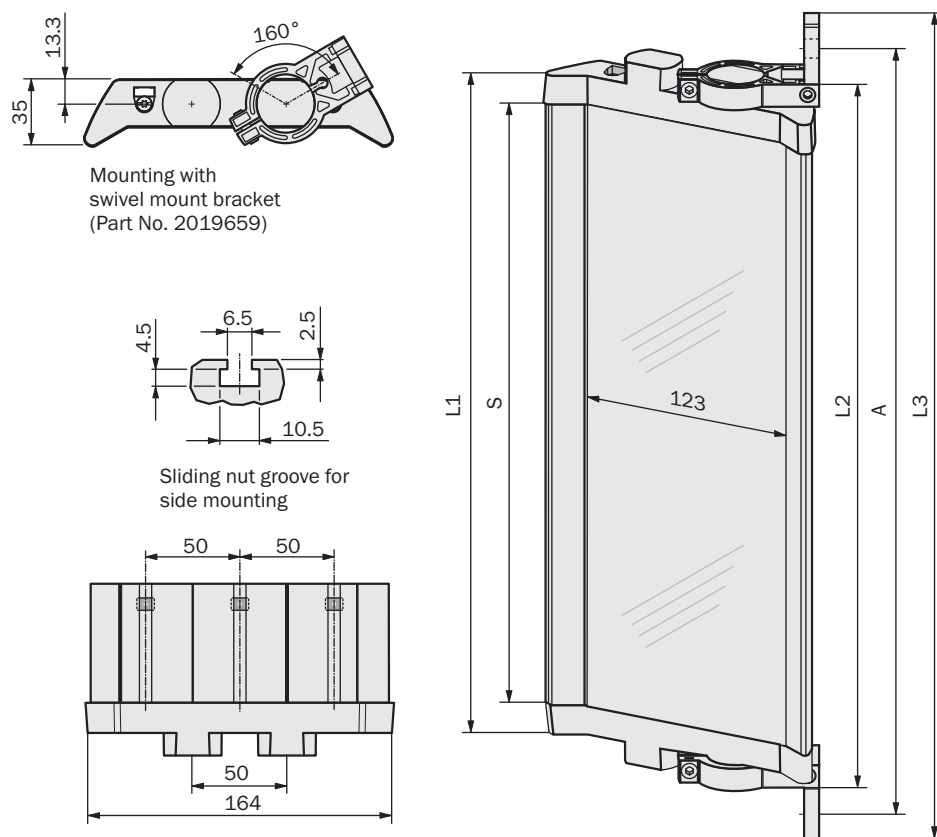


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm



## Technical data overview

Protective field height (depending on type)	300 mm ... 1800 mm
Scanning range (depending on type)	0 m ... 2.5 m / 0 m ... 6 m / 1 m ... 5 m
Resolution (depending on type)	14 mm / 30 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Basic safety light curtain is used wherever hazardous points and hazardous areas require reliable and cost-effective protection. It is a rugged device

designed for use in simple applications. Plus, the C4000 Basic provides alignment and diagnostics via a 7-segment display.

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

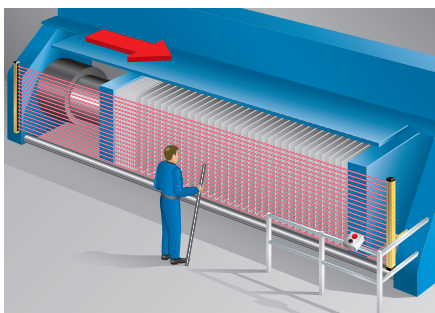
→ For more combinations, see annex

## Applications

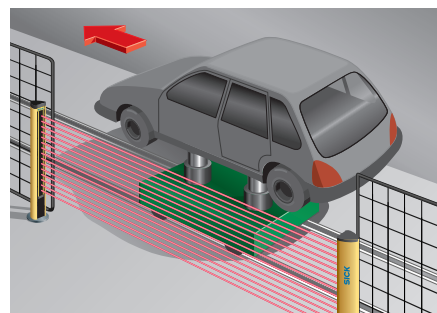
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Automotive industry
- Machine tool industry

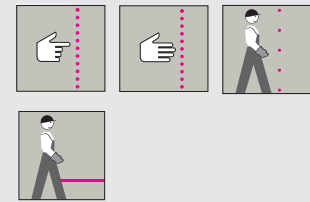
- Environmental engineering



Hazardous point protection on a diaphragm press



Access protection on an assembly line



- External device monitoring (EDM)



F

Further information	Page
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→ Dimensional drawings	F-159
→ Connection diagrams	F-159
→ Accessories	F-160
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C4000 Basic

Usage	As a standalone system
Connection types	System connection: Hirschmann plug M26 x 6 + FE

- Resolution: 14 mm
- Scanning range: 0 m ... 2.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301AA030	1022195	C40E-0301AH030	1022196
450 mm	C40S-0401AA030	1022198	C40E-0401AH030	1022199
600 mm	C40S-0601AA030	1022200	C40E-0601AH030	1022201
750 mm	C40S-0701AA030	1022202	C40E-0701AH030	1022203
900 mm	C40S-0901AA030	1022204	C40E-0901AH030	1022205
1050 mm	C40S-1001AA030	1022206	C40E-1001AH030	1022207
1200 mm	C40S-1201AA030	1022208	C40E-1201AH030	1022209
1350 mm	C40S-1301AA030	1022210	C40E-1301AH030	1022211
1500 mm	C40S-1501AA030	1022212	C40E-1501AH030	1022213
1650 mm	C40S-1601AA030	1022214	C40E-1601AH030	1022215
1800 mm	C40S-1801AA030	1022216	C40E-1801AH030	1022217

- Resolution: 14 mm
- Scanning range: 1 m ... 5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301AA030	1022195	C40E-0301BH030	1022240
450 mm	C40S-0401AA030	1022198	C40E-0401BH030	1022241
600 mm	C40S-0601AA030	1022200	C40E-0601BH030	1022242
750 mm	C40S-0701AA030	1022202	C40E-0701BH030	1022243
900 mm	C40S-0901AA030	1022204	C40E-0901BH030	1022244
1050 mm	C40S-1001AA030	1022206	C40E-1001BH030	1022245
1200 mm	C40S-1201AA030	1022208	C40E-1201BH030	1022246
1350 mm	C40S-1301AA030	1022210	C40E-1301BH030	1022247
1500 mm	C40S-1501AA030	1022212	C40E-1501BH030	1022248
1650 mm	C40S-1601AA030	1022214	C40E-1601BH030	1022249
1800 mm	C40S-1801AA030	1022216	C40E-1801BH030	1022250

- Resolution: 30 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303AA030	1022218	C40E-0303AH030	1022219
450 mm	C40S-0403AA030	1022220	C40E-0403AH030	1022221
600 mm	C40S-0603AA030	1022222	C40E-0603AH030	1022223
750 mm	C40S-0703AA030	1022224	C40E-0703AH030	1022225
900 mm	C40S-0903AA030	1022226	C40E-0903AH030	1022227
1050 mm	C40S-1003AA030	1022228	C40E-1003AH030	1022229
1200 mm	C40S-1203AA030	1022230	C40E-1203AH030	1022231
1350 mm	C40S-1303AA030	1022232	C40E-1303AH030	1022233
1500 mm	C40S-1503AA030	1022234	C40E-1503AH030	1022235
1650 mm	C40S-1603AA030	1022236	C40E-1603AH030	1022237
1800 mm	C40S-1803AA030	1022238	C40E-1803AH030	1022239

## Technical specifications



→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Scanning range (depending on type)	-	0 m ... 2.5 m / 0 m ... 6 m / 1 m ... 5 m
Protective field height (depending on type)	300 mm ... 1800 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 26 ms
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

### Functional data

System part	Sender	Receiver
External device monitoring	-	✓
External device monitoring (delivery status)	-	Deactivated
Configuration method	Hard wired	

## Electrical data

System part	Sender	Receiver
System connection	Hirschmann plug M26 x 6 + FE	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Supply voltage V <sub>S</sub>	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 10 % <sup>3)</sup>	
Safety outputs (OSSD)		
	Type of output	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
	Switching voltage HIGH	24 V DC (15 V DC ... 28.8 V DC)
	Switching voltage LOW	2 V DC
	Switching current	Max. 500 mA
Display elements	7-segment	

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of V<sub>S</sub>.

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## Dimensional drawings

### C4000 Basic

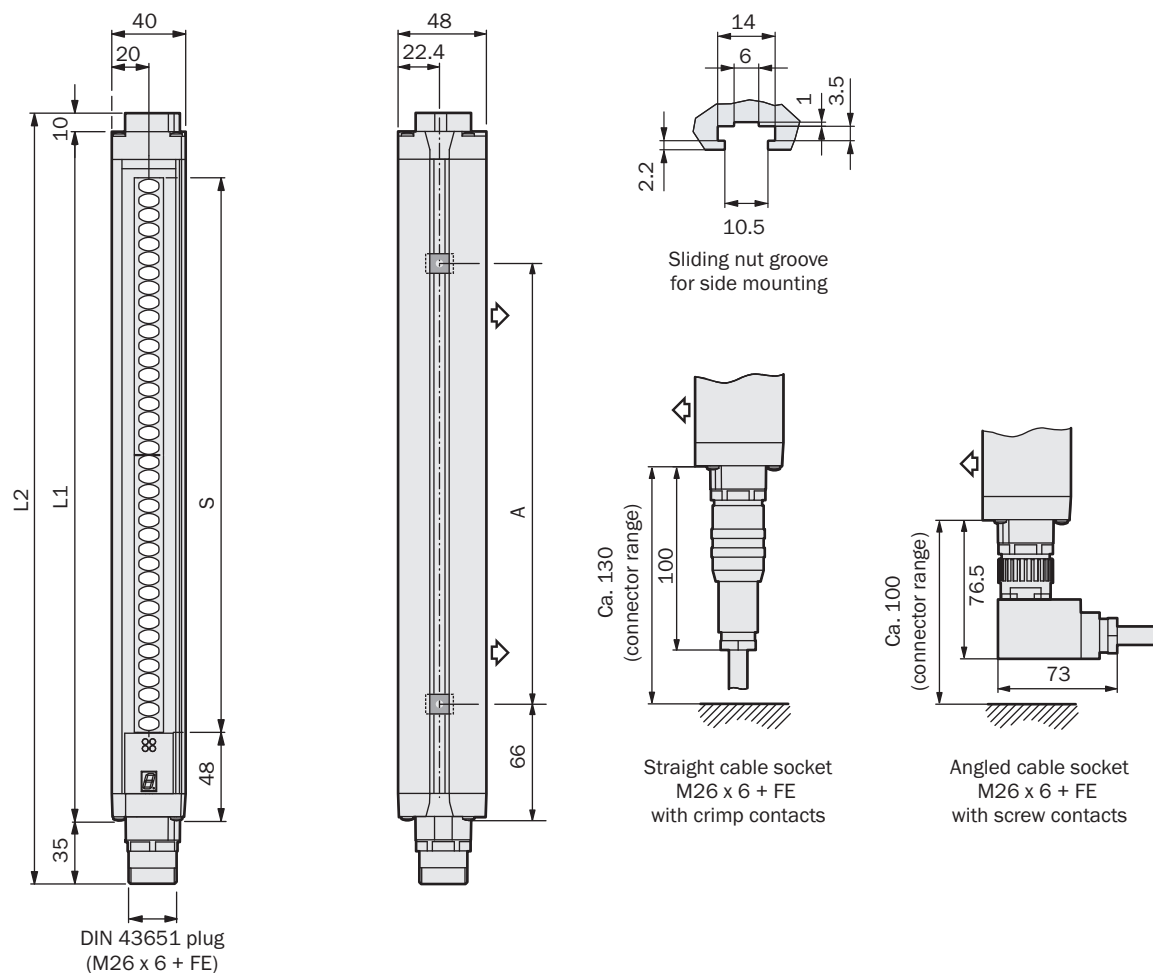


Illustration sender (receiver mirror image)

Protective field height S	L1	L2	A
300	372	417	224
450	523	568	374
600	674	718	524
750	824	869	674
900	975	1020	824
1050	1125	1170	974
1200	1274	1319	1124
1350	1426	1471	1274
1500	1577	1622	1424
1650	1727	1772	1574
1800	1878	1923	1724

Dimensions in mm

## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)










## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847
	Mounting kit 11, replacement bracket, suitable for replacement of FGS	4	BEF-3WNGBCST4	2021646



### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 6 + FE	Straight	2.5 m	DOL-0607G2M5075KM0	2023993
			5 m	DOL-0607G05M075KM0	2023994
			7.5 m	DOL-0607G7M5075KM0	2023995
			10 m	DOL-0607G10M075KM0	2023996
			15 m	DOL-0607G15M075KM0	2023997
			20 m	DOL-0607G20M075KM0	2023998
			30 m	DOL-0607G30M075KM0	2023999


## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 6 + FE	Straight	DOS-0607G000GA3KM0	6006612
		Angled	DOS-0607W000IA3KU0	6007363

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves

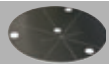



Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

## Mirror columns with protective field height mirror

Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0

## Column parts and accessories


Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Additional front screens


Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2022412
	450 mm	2022413
	600 mm	2022414
	750 mm	2022415
	900 mm	2022416
	1050 mm	2022417
	1200 mm	2022418
	1350 mm	2022419
	1500 mm	2022420
	1650 mm	2022421
	1800 mm	2022422




## Additional heavy-duty front screens

Figure	Suitable for protective field height	Part no.
 <p>Example of use</p>	300 mm	2026853
	450 mm	2026854
	600 mm	2026855
	750 mm	2026856
	900 mm	2026857
	1050 mm	2026858
	1200 mm	2026859
	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863



## PNS75 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
	1800 mm	PNS75-184	1019424	


## PNS125 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435

**Laser alignment aid**



Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731

**Configuration software**

Figure	Description	Remark	Part no.
	CD ROM operating instructions for C4000 Basic Plus, C4000 Basic, C4000 Eco, C4000 Micro	Included with delivery	2026783

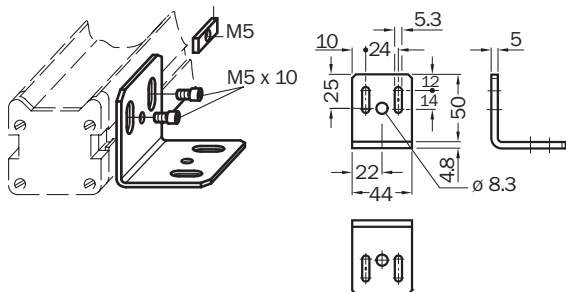
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**Device protection**

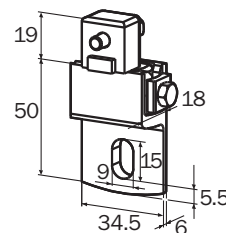
Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

Dimensional drawings mounting systems

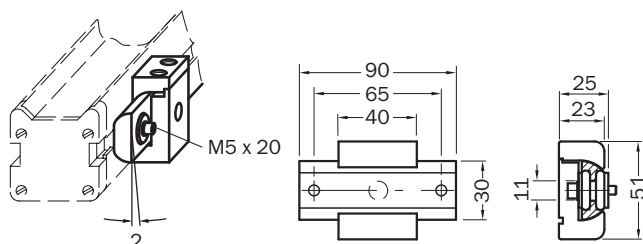
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



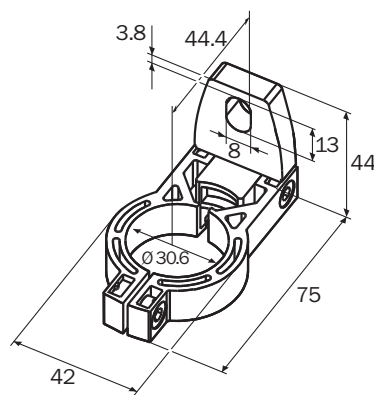
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



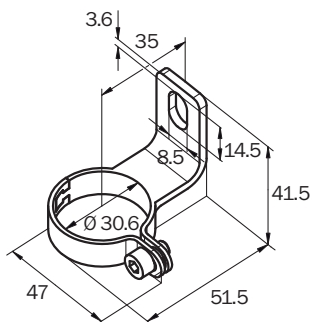
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



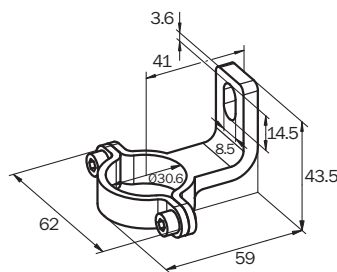
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



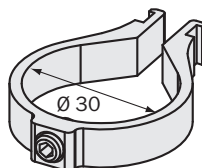
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable

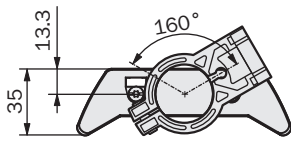


**BEF-2SMMEAAL4, BEF-2SMMEAAL2**  
Omega bracket, flexible and quick installation with only one screw

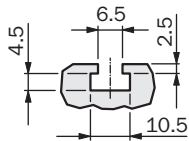


Dimensions in mm

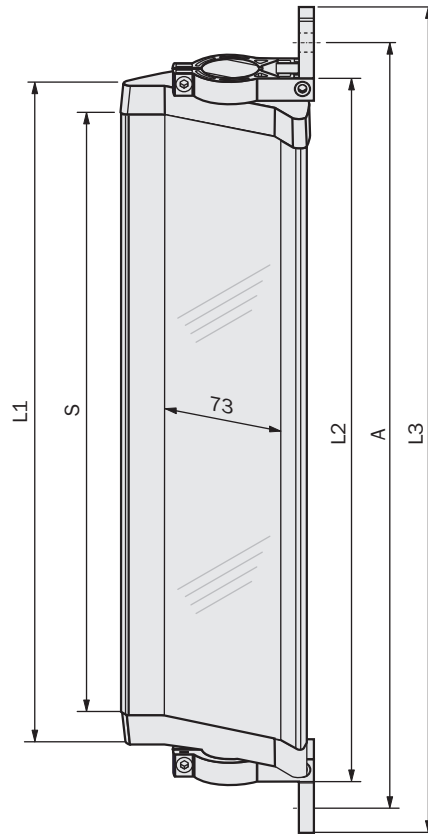
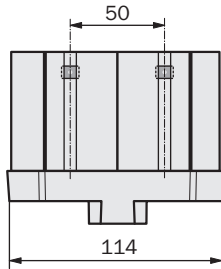
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

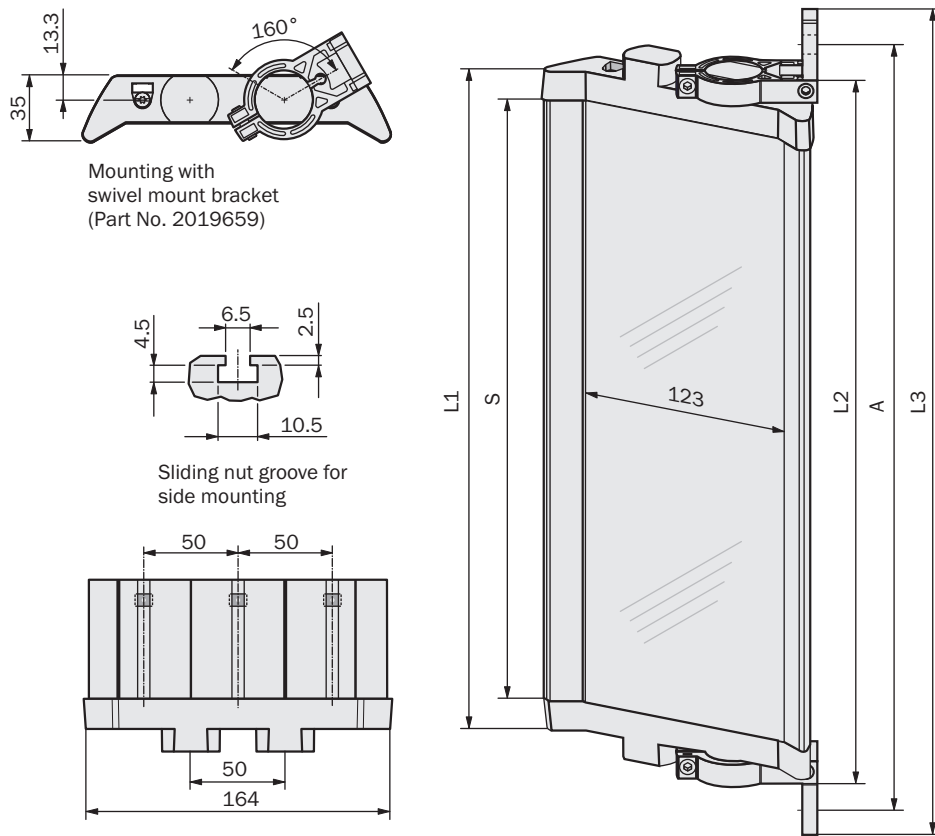


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

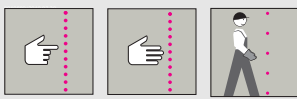
Dimensional drawings PNS125 deflector mirror



F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm



F

- 7-segment display + LED
- Pre-assembled M12 cables



## Technical data overview

Protective field height (depending on type)	300 mm ... 1800 mm
Scanning range (depending on type)	0 m ... 2.5 m / 0 m ... 6 m / 1 m ... 5 m
Resolution (depending on type)	14 mm / 30 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Eco safety light curtain reliably protects hazardous points and hazardous areas. Pre-assembled cable M12 × 5 and innovative accessories, such as the T-piece with only one cable wire to the control cabinet, save money.

The C4000 Eco also features time-saving alignment and diagnostics using the proven 7-segment display.

- Reduced replacement costs and time: Sender and receiver can be replaced separately.

- Security of investment due to high impact resistance and resistance of the front screen to scratches
- High system availability due to tested interaction between sensor and evaluation unit
- Space-saving and compact systems due to fast response times for low safety distances
- High availability even in harsh industrial conditions due to EMC immunity

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52

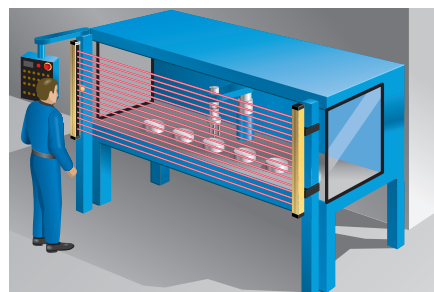
→ For more combinations, see annex

## Applications

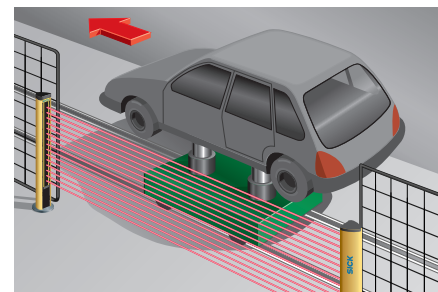
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Car and vehicle manufacturing
- Machine tools
- Electronics industry
- Packaging machinery
- Food and beverage industry
- Handling machines
- Special machine tool manufacturing
- Environmental engineering

Further information	Page
→ Technical specifications	F-171
→ Dimensional drawings	F-172
→ Connection diagrams	F-173
→ Accessories	F-174
→ Systematic safety	A-0
→ Services	B-0



Hazardous point protection on a handling machine



Hazardous point protection on an assembly line

## Ordering information

### C4000 Eco

Usage	As a standalone system
Connection types	System connection: Plug M12 x 5

- Resolution: 14 mm
- Scanning range: 0 m ... 2.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301AA310	1027440	C40E-0301AN310	1027441
450 mm	C40S-0401AA310	1027442	C40E-0401AN310	1027443
600 mm	C40S-0601AA310	1027444	C40E-0601AN310	1027445
750 mm	C40S-0701AA310	1027446	C40E-0701AN310	1027447
900 mm	C40S-0901AA310	1027448	C40E-0901AN310	1027449
1050 mm	C40S-1001AA310	1027450	C40E-1001AN310	1027451
1200 mm	C40S-1201AA310	1027452	C40E-1201AN310	1027453
1350 mm	C40S-1301AA310	1027454	C40E-1301AN310	1027455
1500 mm	C40S-1501AA310	1027456	C40E-1501AN310	1027457
1650 mm	C40S-1601AA310	1027458	C40E-1601AN310	1027459
1800 mm	C40S-1801AA310	1027460	C40E-1801AN310	1027463

- Resolution: 14 mm
- Scanning range: 1 m ... 5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0301AA310	1027440	C40E-0301BN310	1027486
450 mm	C40S-0401AA310	1027442	C40E-0401BN310	1027487
600 mm	C40S-0601AA310	1027444	C40E-0601BN310	1027488
750 mm	C40S-0701AA310	1027446	C40E-0701BN310	1027489
900 mm	C40S-0901AA310	1027448	C40E-0901BN310	1027490
1050 mm	C40S-1001AA310	1027450	C40E-1001BN310	1027491
1200 mm	C40S-1201AA310	1027452	C40E-1201BN310	1027492
1350 mm	C40S-1301AA310	1027454	C40E-1301BN310	1027493
1500 mm	C40S-1501AA310	1027456	C40E-1501BN31	1027494
1650 mm	C40S-1601AA310	1027458	C40E-1601BN310	1027495
1800 mm	C40S-1801AA310	1027460	C40E-1801BN310	1027496

- Resolution: 30 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0303AA310	1027464	C40E-0303AN31	1027465
450 mm	C40S-0403AA310	1027466	C40E-0403AN310	1027467
600 mm	C40S-0603AA310	1027468	C40E-0603AN310	1027469
750 mm	C40S-0703AA310	1027470	C40E-0703AN310	1027471
900 mm	C40S-0903AA310	1027472	C40E-0903AN310	1027473
1050 mm	C40S-1003AA310	1027474	C40E-1003AN310	1027475
1200 mm	C40S-1203AA310	1027476	C40E-1203AN310	1027477
1350 mm	C40S-1303AA310	1027478	C40E-1303AN310	1027479
1500 mm	C40S-1503AA310	1027480	C40E-1503AN310	1027481
1650 mm	C40S-1603AA310	1027482	C40E-1603AN310	1027483
1800 mm	C40S-1803AA310	1027484	C40E-1803AN310	1027485

F



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	14 mm / 30 mm	
Scanning range (depending on type)	-	0 m ... 2.5 m / 0 m ... 6 m / 1 m ... 5 m
Protective field height (depending on type)	300 mm ... 1800 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	Max. 26 ms	
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

### Electrical data

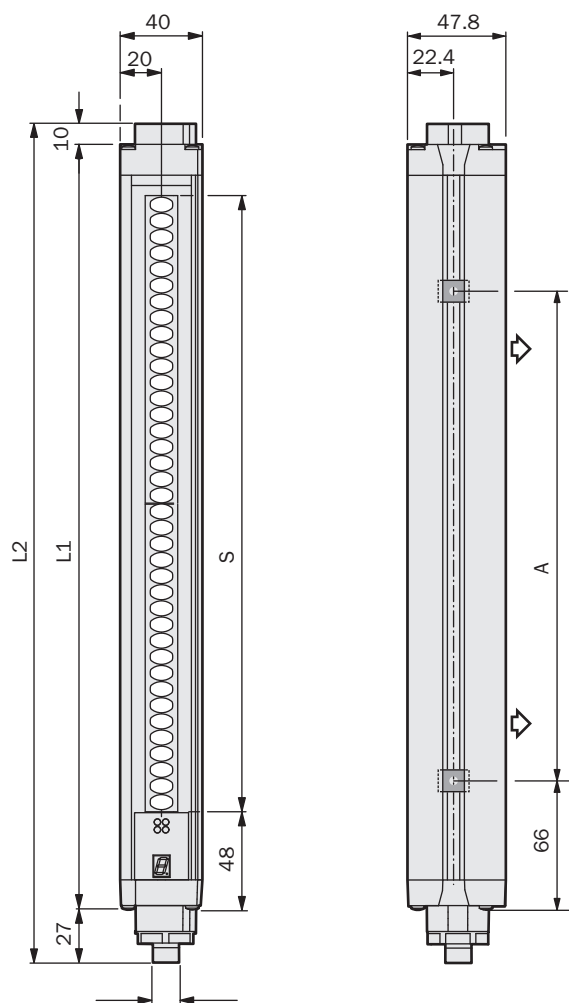
System part	Sender	Receiver
System connection	Plug M12 x 5	
Connecting cable length	Max. 15 m	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>1)</sup>	
Residual ripple	$\leq 10\%$ <sup>2)</sup>	
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	24 V DC (15 V DC ... 28.8 V DC)
Switching voltage LOW	-	2 V DC
Switching current	-	Max. 500 mA
Display elements	7-segment	

<sup>1)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>2)</sup> Within the limits of  $V_s$ .

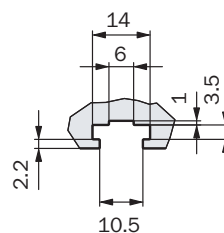
# Dimensional drawings

## C4000 Eco

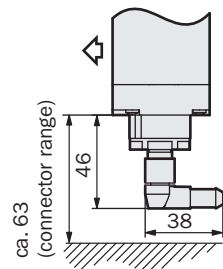
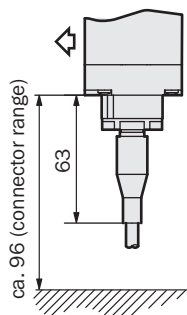
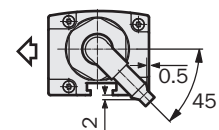


Plug M12 x 4 + FE

Illustration sender (receiver mirror image)



Sliding nut groove for side mounting



Cable sockets M12 x 4 + FE

Protective field height S	L1	L2	A
300	372	409	224
450	523	560	374
600	674	711	524
750	824	861	674
900	975	1012	824
1050	1125	1162	974
1200	1274	1311	1124
1350	1426	1463	1274
1500	1577	1614	1424
1650	1727	1764	1574
1800	1878	1915	1724

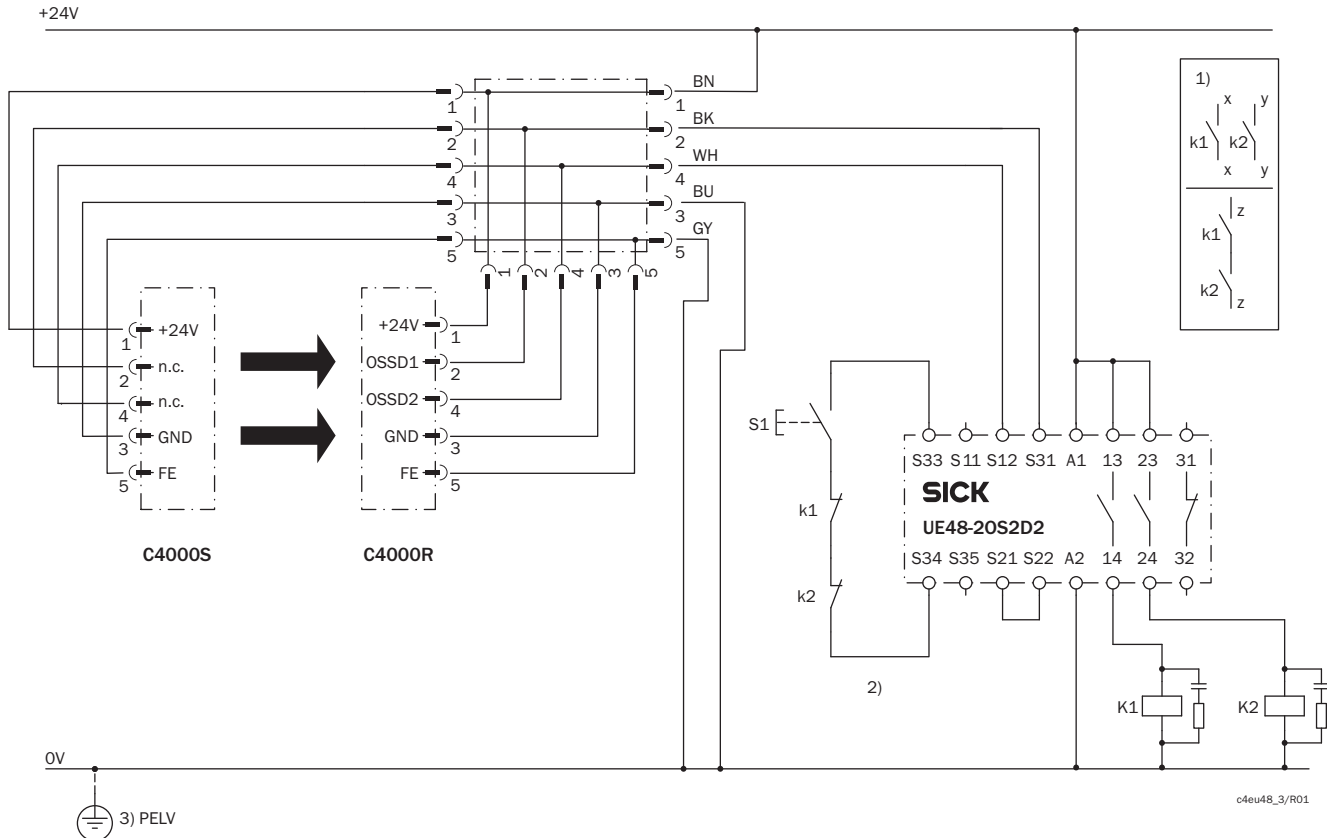
Dimensions in mm



# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## C4000 Eco with T-piece on UE48-20S safety relay



### Task

Connection of a C4000 Eco safety light curtain with a T-piece to a UE48-20S safety relay.

Operating mode: with restart interlock and external device monitoring.

### Operating characteristics

When the light path is clear, the OSSD1 and OSSD2 outputs are live. When K1 and K2 are de-energized and functioning correctly, the system is ready for switch-on and waits for an input signal/switch-on signal. The UE48-20S is switched on by pressing and releasing the S1 button. The outputs (contacts 13 - 14 and 23 - 24) energize the K1 and K2 contactors. Upon interruption of one or several of the light beams in the active protective field, the OSSD1 and OSSD2 outputs shut down the UE48-20S. The contactors K1 and K2 are de-energized.

### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of one of

the K1 or K2 contactors will be detected. The shutdown function is retained. On manipulation (e.g., jamming) of the S1 button, the UE48-20S will not re-enable the output current circuits.

### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel insertion in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
- 2) The external device monitoring is only static.
- 3) PELV in accordance with the requirements in EN 60204-1 / 6.4. Take note of the operating instructions of the integrated devices. This circuit can also be used for the UE48-30S.










## sens:Control – safe control solutions



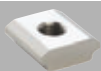
Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories

### Mounting systems


Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847
	Mounting kit 11, replacement bracket, suitable for replacement of FGS	4	BEF-3WNGBCST4	2021646

### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600

F


## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 5	Straight	2 m	DOL-1205-G02M	6008899
			5 m	DOL-1205-G05M	6009868
			10 m	DOL-1205-G10M	6010544
			15 m	DOL-1205-G15M	6029215


## T-junction

Connection type	Remark	Type	Part no.
Plug M12 x 5	T-connector plugs directly into receiver, splits the single home run from control cabinet between sender and receiver	DSC-1205T000025KM0	6030664

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves





Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

## Mirror columns with protective field height mirror

Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0


## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938


## Additional front screens

Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2022412
	450 mm	2022413
	600 mm	2022414
	750 mm	2022415
	900 mm	2022416
	1050 mm	2022417
	1200 mm	2022418
	1350 mm	2022419
	1500 mm	2022420
	1650 mm	2022421
	1800 mm	2022422


## Additional heavy-duty front screens

Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2026853
	450 mm	2026854
	600 mm	2026855
	750 mm	2026856
	900 mm	2026857
	1050 mm	2026858
	1200 mm	2026859
	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863

**PNS75 deflector mirror**



Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
			1800 mm	PNS75-184

**PNS125 deflector mirror**


Figure	Mirror material	For maximum protective field height	Type	Part no.		
	Glass	300 mm	PNS125-034	1019425		
		450 mm	PNS125-049	1019426		
		600 mm	PNS125-064	1019427		
		750 mm	PNS125-079	1019428		
		900 mm	PNS125-094	1019429		
		1050 mm	PNS125-109	1019430		
		1200 mm	PNS125-124	1019431		
		1350 mm	PNS125-139	1019432		
		1500 mm	PNS125-154	1019433		
		1650 mm	PNS125-169	1019434		
				1800 mm	PNS125-184	1019435

F



**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731

**Configuration software**

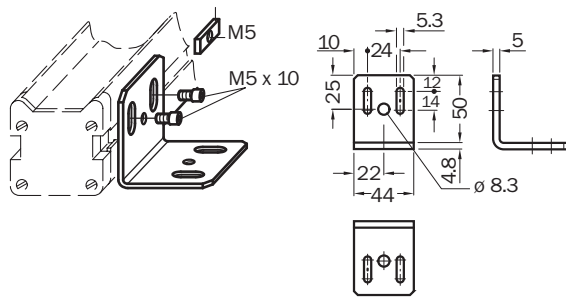
Figure	Description	Remark	Part no.
	CD ROM operating instructions for C4000 Basic Plus, C4000 Basic, C4000 Eco, C4000 Micro	Included with delivery	2026783

Device protection

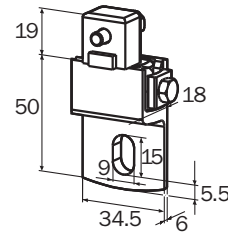
Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

Dimensional drawings mounting systems

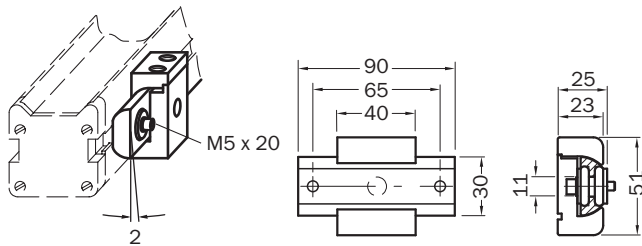
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



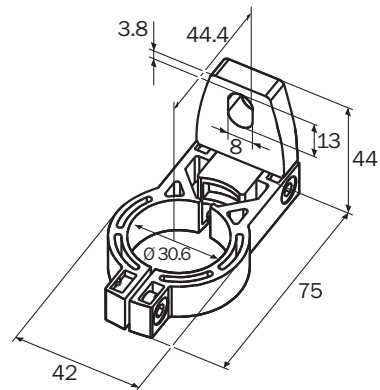
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



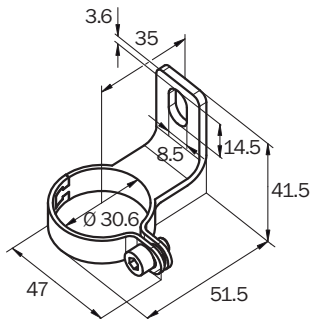
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



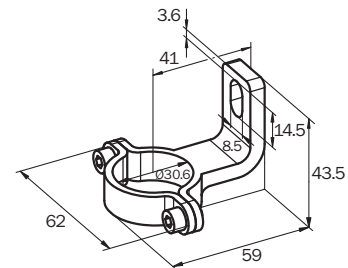
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



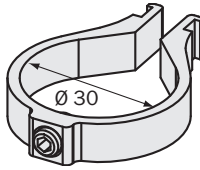
**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



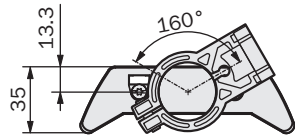
Dimensions in mm



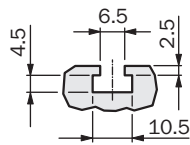
**BEF-2SMMEAAL4, BEF-2SMMEAAL2**  
**Omega bracket, flexible and quick installation**  
**with only one screw**



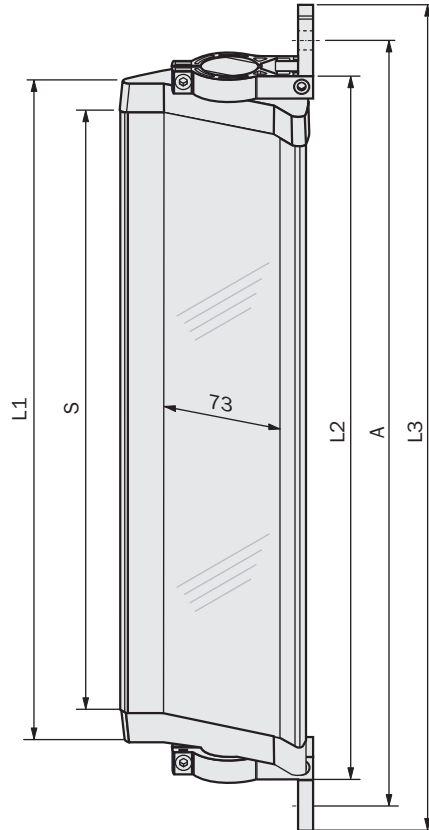
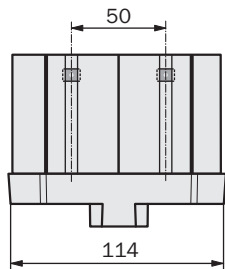
**Dimensional drawings PNS75 deflector mirror**



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

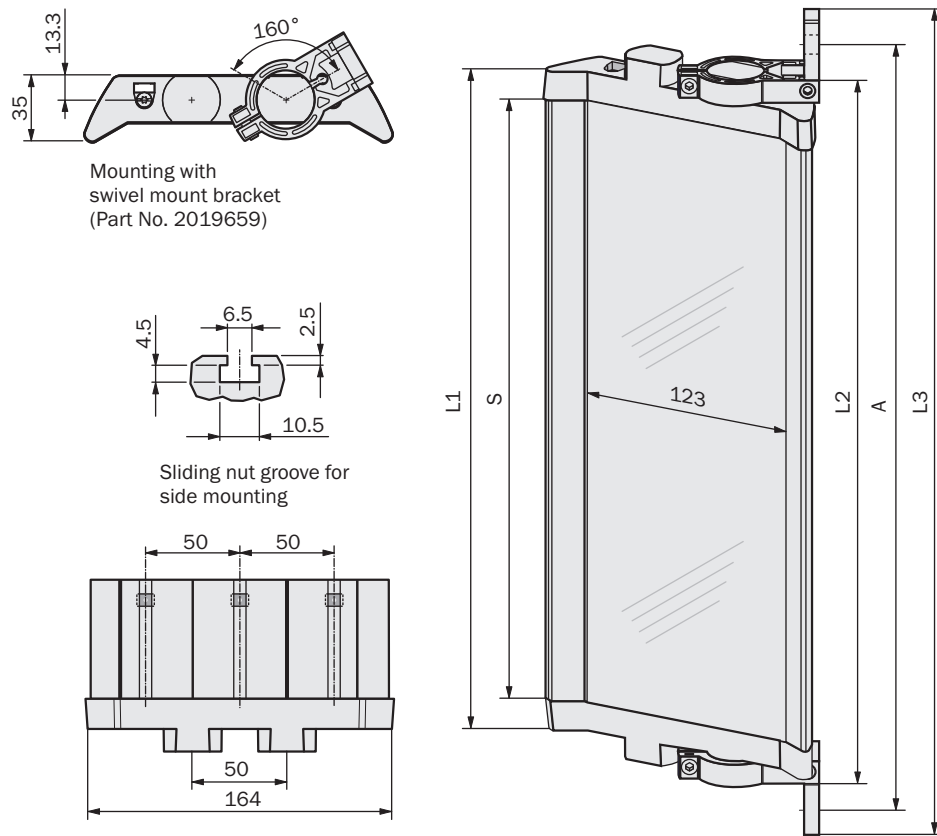


**F**

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

## Technical data overview

Protective field height (depending on type)	900 mm ... 1500 mm
Scanning range	0.5 m ... 19 m
Resolution	20 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Entry/Exit safety light curtain is used wherever material is automatically transported into the dangerous area in a machine and, at the same time, access by people must be reliably excluded:

- Maximum safety due to continuously active light curtain – tampering is very difficult
- Cost-effective due to savings on additional sensor systems or other protection

measures, e.g., muting sensors, muting lamp, hinged doors, etc.

- Very high availability due to self-teach distance monitoring
- Reduced mounting effort due to compact pair of sensors
- Functions can be activated without additional control device
- The integrated EFl interface allows the use of additional sensor functions (see A-8).

## In-system added value

Combined with SICK safe control solutions

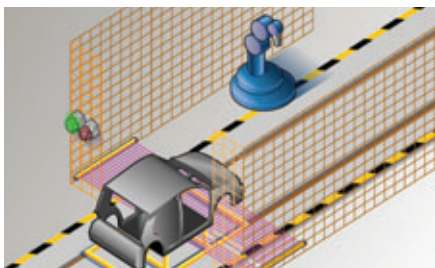
Combination with	Restart interlock	External device monitoring	Bypass	Operating mode selection	Further information
UE402	-	-	✓	✓	F-184
Flexi Classic	✓	✓	-	-	O-2
Flexi Soft	✓	✓	✓	✓	O-25
UE48-20S	✓	✓	-	-	N-46
UE48-30S	✓	✓	-	-	N-52
UE10-30S	Contact expansion module				N-63

→ For more combinations, see annex

## Applications

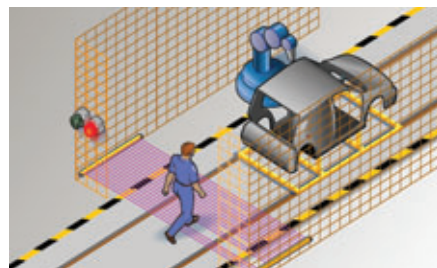
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

### ■ Automotive industry



Horizontal safety light curtain. No additional muting sensors required

### ■ Material handling



Invalid objects or asynchronous movements result in shut down



- Self-teach dynamic blanking
- External device monitoring (EDM)
- Restart interlock (RES)
- Configuration and diagnostics via PC
- Beam coding
- Multiple sampling to increase availability



F

Further information	Page
→ Ordering information	F-182
→ Technical specifications	F-182
→ Dimensional drawings	F-185
→ Connection diagrams	F-186
→ Accessories	F-186
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C4000 Entry/Exit

Usage	As a standalone system
Connection types	System connection: Hirschmann plug M26 x 11 + FE Configuration connection: M8 x 4

- Resolution: 20 mm
- Scanning range: 0.5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
900 mm	C40S-0902CI010	1023968	C40E-0902CI010	1023969
1050 mm	C40S-1002CI010	1024044	C40E-1002CI010	1024045
1200 mm	C40S-1202CI010	1024046	C40E-1202CI010	1024047
1350 mm	C40S-1302CI010	1024048	C40E-1302CI010	1024049
1500 mm	C40S-1502CI010	1024050	C40E-1502CI010	1024051

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### UE402 switching amplifier

Description	Type	Part no.
Expands C4000 Standard, Advanced, Palletizer, Entry/Exit and Fusion with the functions described in the technical data, e.g., bypass, operating mode switching or in addition PSDI mode on C4000 Standard, Advanced.	UE402	1023577

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution	20 mm	
Scanning range	-	0.5 m ... 19 m
Protective field height (depending on type)	900 mm ... 1500 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	38 ms <sup>1)</sup>
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

<sup>1)</sup> Without beam coding, multiple sampling 3 times. Other response times, see operating instructions.

## Functional data

System part	Sender	Receiver
Restart interlock	-	✓
Restart interlock (delivery status)	-	External
External device monitoring	-	✓
External device monitoring (delivery status)	-	Deactivated
Beam coding		✓
Beam coding (delivery status)	-	Non-coded
Operating mode switching (with UE402)	-	✓
Muting		Self-teach dynamic blanking
Delivery status		None
Type of self-teach dynamic blanking	-	Object pattern recognition
Safe device communication via EFI/SDL		✓
Configuration method	PC with CDS (configuration and diagnostic software)	

## Electrical data

System part	Sender	Receiver
System connection	Hirschmann plug M26 x 11 + FE	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Configuration connection	M8 x 4	
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	$\leq 10\%$ <sup>3)</sup>	
Safety outputs (OSSD)		2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Type of output	-	
Switching voltage HIGH	-	24 V DC ( $V_S - 2.25$ V DC ... $V_S$ )
Switching voltage LOW	-	2 V DC
Switching current	-	Max. 500 mA
Display elements	7-segment	

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of  $V_S$ .

## UE402 switching amplifier

### General data

Safety related parameters		
	Type	Type 4 (IEC 61496)
	Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
	Category	Category 4 (EN ISO 13849)
	Performance level	PL e (EN ISO 13849)
	PFHd (mean probability of a dangerous failure per hour)	$15 \times 10^{-9}$ (EN ISO 13849)
	$T_M$ (Mission Time)	20 years (EN ISO 13849)
Protection class		III (IEC 536:1976)
Enclosure rating		IP 20 (IEC 60529)
Ambient operating temperature from ... to		0 °C ... +55 °C
Air humidity from ... to		15 % ... 95 %, non-condensing
Storage temperature from ... to		-25 °C ... +70 °C
Weight		120 g
Housing material		Plastic

### Functional data

Bypass	✓
Operating mode switching	✓

### Electrical data

Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC)
Residual ripple	$\leq 10$ %
Power consumption	Max. 110 mA
Switch-on time	Max. 4 s
IN A1 ... A6, MCC-BDC, MCC-TDC	
Switching voltage HIGH	24 V DC (11 V DC ... 30 V DC)
Switching voltage LOW	-30 V DC ... 5 V DC
Switching current HIGH	6 mA ... 20 mA
Switching current LOW	-3 mA ... 0.5 mA
Change over time operating mode selection	Max. 2 s
IN B1, IN B2, OUT B1, OUT B2	
Change over time bypass	Max. 2 s
Synchronous time monitoring	200 ms

### Safety outputs

Connection type	Screw-terminal connector
Conductor cross-section	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

# Dimensional drawings

## C4000 Entry/Exit

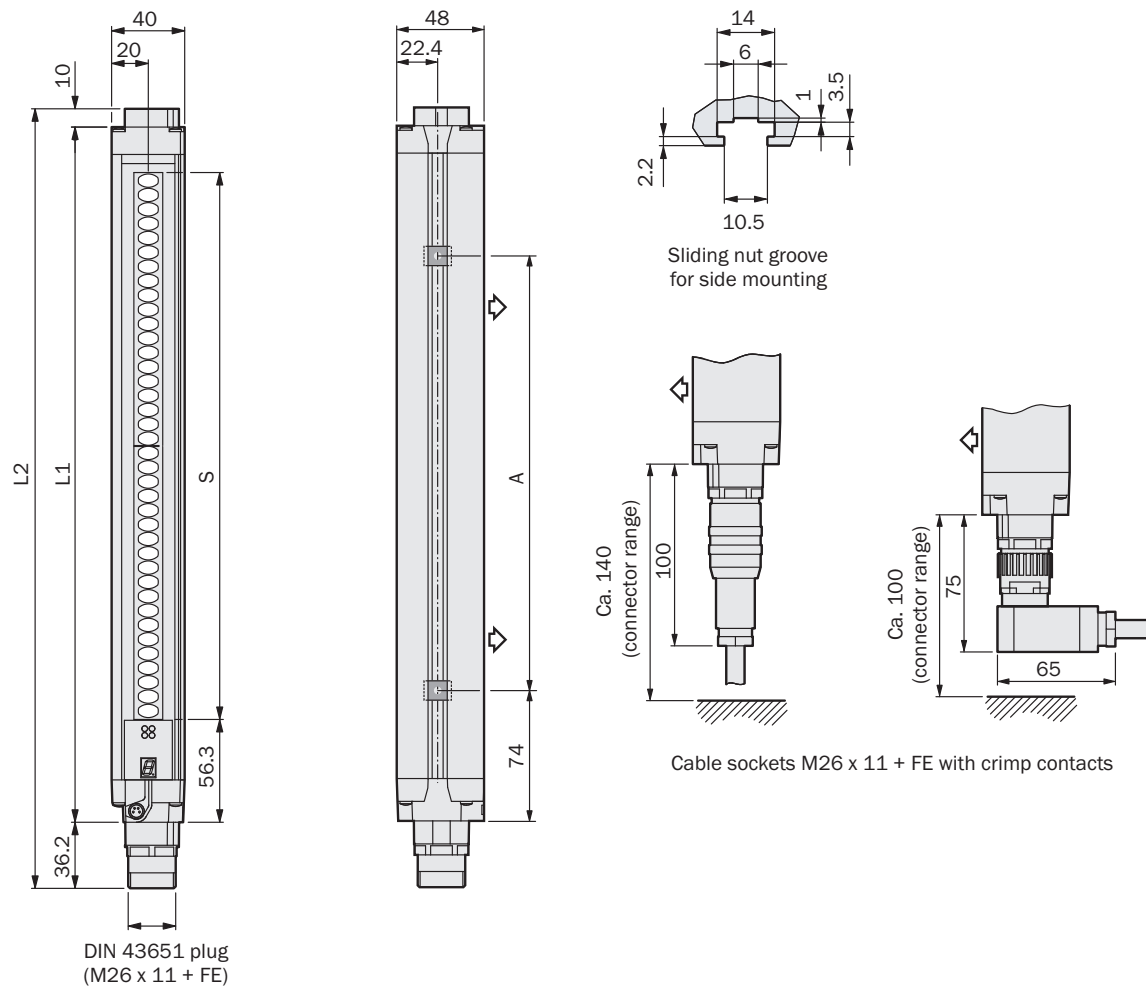


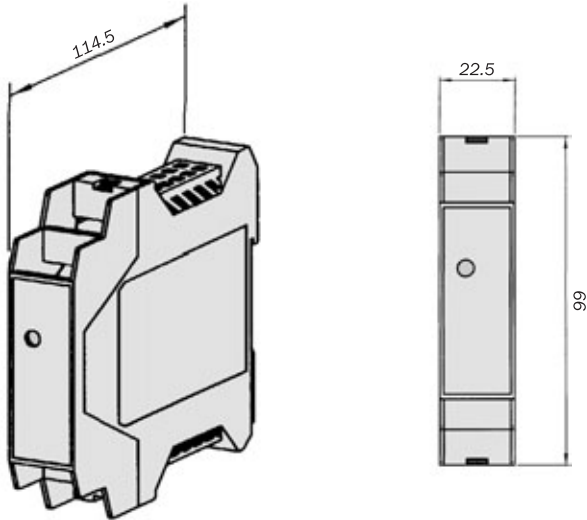
Illustration sender (receiver mirror image)

Protective field length S	L1	L2	A
900	984	1030	824
1050	1134	1180	974
1200	1283	1329	1124
1350	1435	1481	1274
1500	1586	1632	1424

Dimensions in mm



**UE402 switching amplifier**



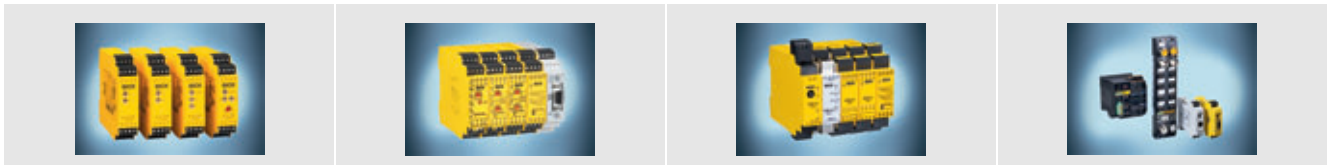
Dimensions in mm

F

**Connection diagrams**

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)





**sens:Control – safe control solutions**



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).






**Accessories**

**Mounting systems**

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659




## Mounting systems (cont'd)


Figure	Property	Packing unit	Type	Part no.
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847
	Stand, for horizontal mounting of C4000 Fusion, Entry/Exit, and Palletizer safety light curtains and M4000 Area multiple light beam safety devices, for mounting heights from 70 mm to 780 mm	2	BEF-3HHOCAST2	2041661

F



## Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550



## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	DOL-0612G2M5075KM0	2022544
			5 m	DOL-0612G05M075KM0	2022545
			7.5 m	DOL-0612G7M5075KM0	2022546
			10 m	DOL-0612G10M075KM0	2022547
			15 m	DOL-0612G15M075KM0	2022548
			20 m	DOL-0612G20M075KM0	2022549
			30 m	DOL-0612G30M075KM0	2022550
			50 m	DOL-0612G50MD75KM0	2033548


## Connectors

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable plug M26 x 11 + FE	Straight	STE-0612G000GA3KM0	6021191
		Angled	STE-0612W000GA3KM0	6021192

## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758


## Configuration connection cables

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649


## Terminators

Description	Remark	Type	Part no.
Terminal with 182 Ω resistance for pin 9 and 10 on the system connection	For improving the EMC behavior if EFL device communication is not used	Terminal with 182 Ω resistance	2027227

## Power supply units


Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Additional front screens



Figure	Suitable for protective field height	Part no.
 Example of use	900 mm	2022416
	1050 mm	2022417
	1200 mm	2022418
	1350 mm	2022419
	1500 mm	2022420

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**Additional heavy-duty front screens**

Figure	Suitable for protective field height	Part no.
 <p>Example of use</p>	900 mm	2026857
	1050 mm	2026858
	1200 mm	2026859
	1350 mm	2026860
	1500 mm	2026861

**Laser alignment aid**



Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461

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**Configuration software**

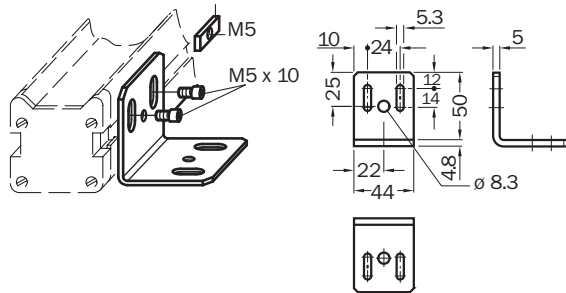
Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Configuration tools**

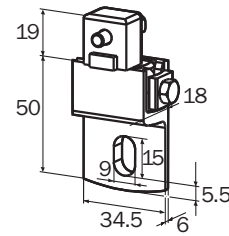
Figure	Description	Type	Part no.
	For saving and transferring configurations. For C4000 Standard, Advanced, Palletizer, Entry/Exit, Fusion and M4000 Advanced, Advanced Curtain, Area	Clone Plug for C4000 and M4000	1029665
	For resetting a system position saved in a C4000 (host, guest 1, guest 2). For C4000 Standard, Advanced, Palletizer, Entry/Exit	Host-Guest Plug for C4000	1029717
	-	Wall mount	5318443

Dimensional drawings mounting systems

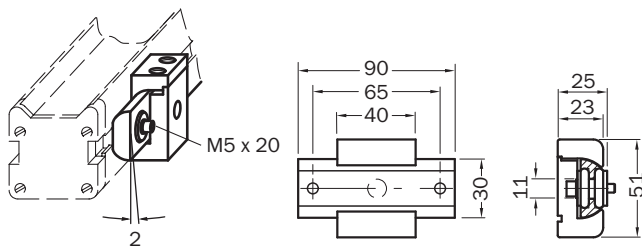
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



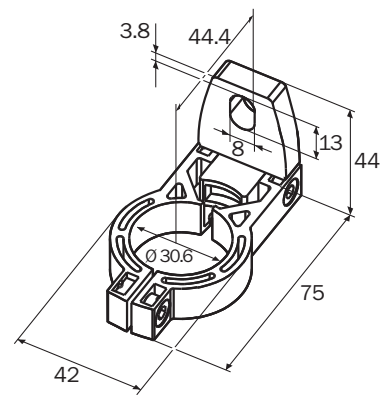
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



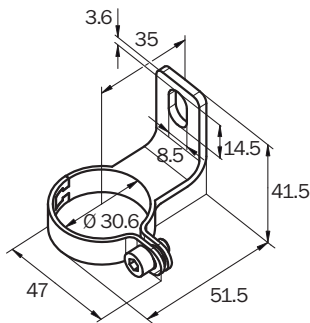
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



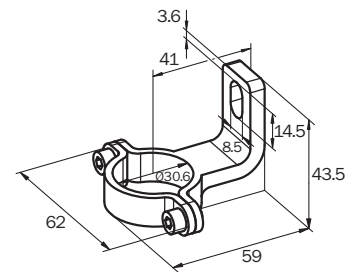
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



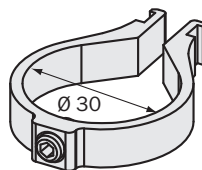
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



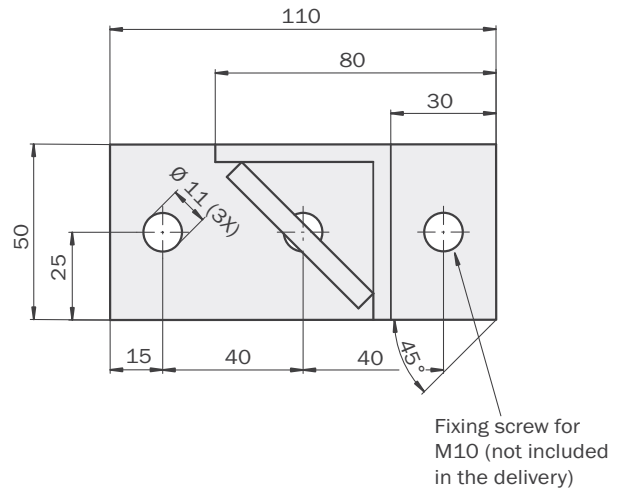
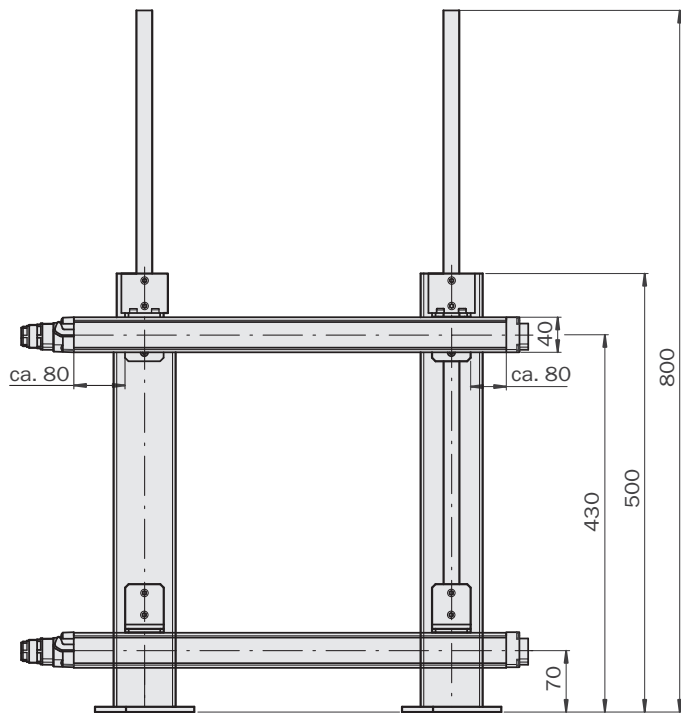
**BEF-2SMMEAL4**  
Omega bracket, flexible and quick installation with only one screw



Dimensions in mm

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**BEF-3HHOCAST2**  
Stand, for horizontal mounting



Dimensions in mm





- Muting alternative
- Self-teach dynamic blanking
  - Goods detection
  - Pallet detection
- Direction monitoring
- Beam coding
- Reduced resolution
- Object gap suppression
- Velocity monitoring
- Multiple sampling



F

## Technical data overview

Protective field height (depending on type)	750 mm ... 1800 mm
Scanning range	0.5 m ... 6 m
Resolution (depending on type)	30 mm / 40 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Palletizer safety light curtain is the innovative muting alternative for access protection during automatic material transport.

- Economical: only one sensor pair provides cost savings during planning, design, mounting, wiring and service
- Quickly placed in operation so that pallets, mesh crates, etc., are recognized without programming

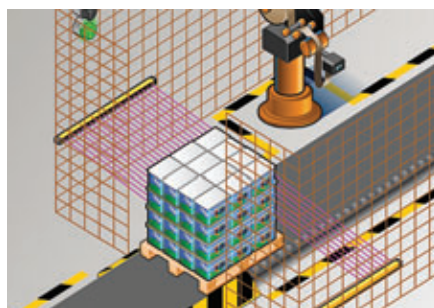
- Very high availability due to self-teach recognition of patterns on loading with different pallets
- Easily integrated: no secondary sensors necessary, only the OSSDs are implemented in the stop circuit
- Safer: provides protection in areas in which there is no object, unlike conventional muting solutions.
- The integrated EFI interface allows the use of additional sensor functions (see A-8).

	C4000 Palletizer Standard	C4000 Palletizer Advanced
Detected objects	Packages (min. size of 500 mm)	Pallets, mesh crates, mesh carriage or packages (max. size of 240 m)
Pattern recognition	By size and solid shape of package	Using size and number of objects (min. 2) and monitoring the distance between them
Automatic teach-In	✓	✓
Resolution	40 mm	30 mm

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

### ■ Material handling



Sensor differentiates between packages and worker

### ■ Packaging industry



Sensor differentiates between pallets and worker

Further information	Page
→ Technical specifications	F-194
→ Dimensional drawings	F-198
→ Connection diagrams	F-200
→ Accessories	F-200
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C4000 Palletizer Standard

Usage	As a standalone system
Connection types	System connection: Hirschmann plug M26 x 11 + FE Configuration connection: M8 x 4

- Resolution: 40 mm
- Scanning range: 0.5 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
750 mm	C40S-0704CD010	1043445	C40E-0704FP010	1043171
900 mm	C40S-0904CD010	1043446	C40E-0904FP010	1043172
1050 mm	C40S-1004CD010	1043447	C40E-1004FP010	1043173
1200 mm	C40S-1204CD010	1043448	C40E-1204FP010	1043174
1350 mm	C40S-1304CD010	1043449	C40E-1304FP010	1043175
1500 mm	C40S-1504CD010	1043450	C40E-1504FP010	1043176
1650 mm	C40S-1604CD010	1043451	C40E-1604FP010	1043177
1800 mm	C40S-1804CD010	1043452	C40E-1804FP010	1043178

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### C4000 Palletizer Advanced

Usage	As a standalone system
Connection types	System connection: Hirschmann plug M26 x 11 + FE Configuration connection: M8 x 4

- Resolution: 30 mm
- Scanning range: 0.5 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
750 mm	C40S-0703CD010	1041900	C40E-0703FK010	1043155
900 mm	C40S-0903CD010	1041901	C40E-0903FK010	1043156
1050 mm	C40S-1003CD010	1041902	C40E-1003FK010	1043157
1200 mm	C40S-1203CD010	1041903	C40E-1203FK010	1043158
1350 mm	C40S-1303CD010	1041904	C40E-1303FK010	1043159
1500 mm	C40S-1503CD010	1041905	C40E-1503FK010	1043160
1650 mm	C40S-1603CD010	1041907	C40E-1603FK010	1043161
1800 mm	C40S-1803CD010	1041908	C40E-1803FK010	1043162

## C4000 Palletizer Advanced with extension connection on receiver (e.g., bypass)

Usage	As a standalone system
Connection types	System connection: Hirschmann plug M26 x 11 + FE Extension connection: Hirschmann socket M26 x 11 + FE Configuration connection: M8 x 4

- Resolution: 30 mm
- Scanning range: 0.5 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
750 mm	C40S-0703CD010	1041900	C40E-0703GK010	1043220
900 mm	C40S-0903CD010	1041901	C40E-0903GK010	1043179
1050 mm	C40S-1003CD010	1041902	C40E-1003GK010	1043180
1200 mm	C40S-1203CD010	1041903	C40E-1203GK010	1043221
1350 mm	C40S-1303CD010	1041904	C40E-1303GK010	1043181
1500 mm	C40S-1503CD010	1041905	C40E-1503GK010	1043222
1650 mm	C40S-1603CD010	1041907	C40E-1603GK010	1043223
1800 mm	C40S-1803CD010	1041908	C40E-1803GK010	1043182

## UE402 switching amplifier

Description	Type	Part no.
Expands C4000 Standard, Advanced, Palletizer, Entry/Exit and Fusion with the functions described in the technical data, e.g., bypass, operating mode switching or in addition PSDI mode on C4000 Standard, Advanced.	UE402	1023577

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## General data

System part	Sender	Receiver
Resolution (depending on type)	30 mm / 40 mm	
Scanning range	0.5 m ... 6 m	
Protective field height (depending on type)	750 mm ... 1800 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	–	Max. 14 ms <sup>1)</sup>
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	–25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	

<sup>1)</sup> Without beam coding, with 1 x sampling. Other response times, see operating instructions.



## Functional data

	C4000 Palletizer Standard	C4000 Palletizer Advanced	C4000 Palletizer Advanced with extension connection
Restart interlock		✓	
Restart interlock (delivery status)		External	
External device monitoring		✓	
External device monitoring (delivery status)		Deactivated	
Beam coding		✓	
Beam coding (delivery status)		Non-coded	
Multiple sampling		✓	
Multiple sampling (delivery status)		3 x sampling	
Direction monitoring		✓	
Reduced resolution		✓	
Reduced resolution (delivery status)		Deactivated	
Extension connection	-		✓
Emergency stop / bypass at extension connection	-		✓
Bypass (with UE402)		✓	
Operating mode switching (with UE402)		✓	
Blanking	Self-teach dynamic blanking		
Delivery status	Goods detection: 500 mm ... protective field height - 150 mm	Pallet detection: 0 .. 240 mm, 2 ... 5 objects	
Type of self-teach dynamic blanking	Goods detection	Pallet detection	
Speed monitoring		✓ <sup>1)</sup>	
Goods detection	✓	✓	✓
Object size monitoring	✓	✓ <sup>2)</sup>	✓ <sup>2)</sup>
Individual objects teach-in	✓	✓	✓
Object gap suppression	✓	✓ <sup>2)</sup>	✓ <sup>2)</sup>
Pallet detection	-	✓	✓
Object entry monitoring		✓	
Safe device communication via EFI/SDL		✓	
SDL interface		✓	
Configuration method	PC with CDS (configuration and diagnostic software)		

<sup>1)</sup> Software version V 06.2x or higher

<sup>2)</sup> Only in case when blanking of a single object is configured.

## Electrical data

System part	Sender	Receiver
System connection	Hirschmann plug M26 x 11 + FE	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Extension connection (depending on type)	-	Hirschmann socket M26 x 11 + FE
Configuration connection	M8 x 4	
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	$\leq 10\%$ <sup>3)</sup>	
Power consumption	Max. 1 A	Max. 1.8 A
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	24 V DC ( $V_S - 2.25$ V DC ... $V_S$ )
Switching voltage LOW	-	2 V DC
Switching current	-	Max. 500 mA
Switch off time	-	Min. 1000 ms
Display elements	7-segment	

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>3)</sup> Within the limits of  $V_S$ .

## UE402 switching amplifier

## General data

Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$15 \times 10^{-9}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Protection class	III (IEC 536:1976)	
Enclosure rating	IP 20 (IEC 60529)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Storage temperature from ... to	-25 °C ... +70 °C	
Weight	120 g	
Housing material	Plastic	

## Functional data

Bypass	✓
Operating mode switching	✓

**Electrical data**

Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC)
Residual ripple	$\leq 10$ %
Power consumption	Max. 110 mA
Switch-on time	Max. 4 s
IN A1 ... A6, MCC-BDC, MCC-TDC	
Switching voltage HIGH	24 V DC (11 V DC ... 30 V DC)
Switching voltage LOW	-30 V DC ... 5 V DC
Switching current HIGH	6 mA ... 20 mA
Switching current LOW	-3 mA ... 0.5 mA
Change over time operating mode selection	Max. 2 s
IN B1, IN B2, OUT B1, OUT B2	
Change over time bypass	Max. 2 s
Synchronous time monitoring	200 ms

**Safety outputs**

Connection type	Screw-terminal connector
Conductor cross-section	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

**F**

# Dimensional drawings

## C4000 Palletizer Standard, C4000 Palletizer Advanced

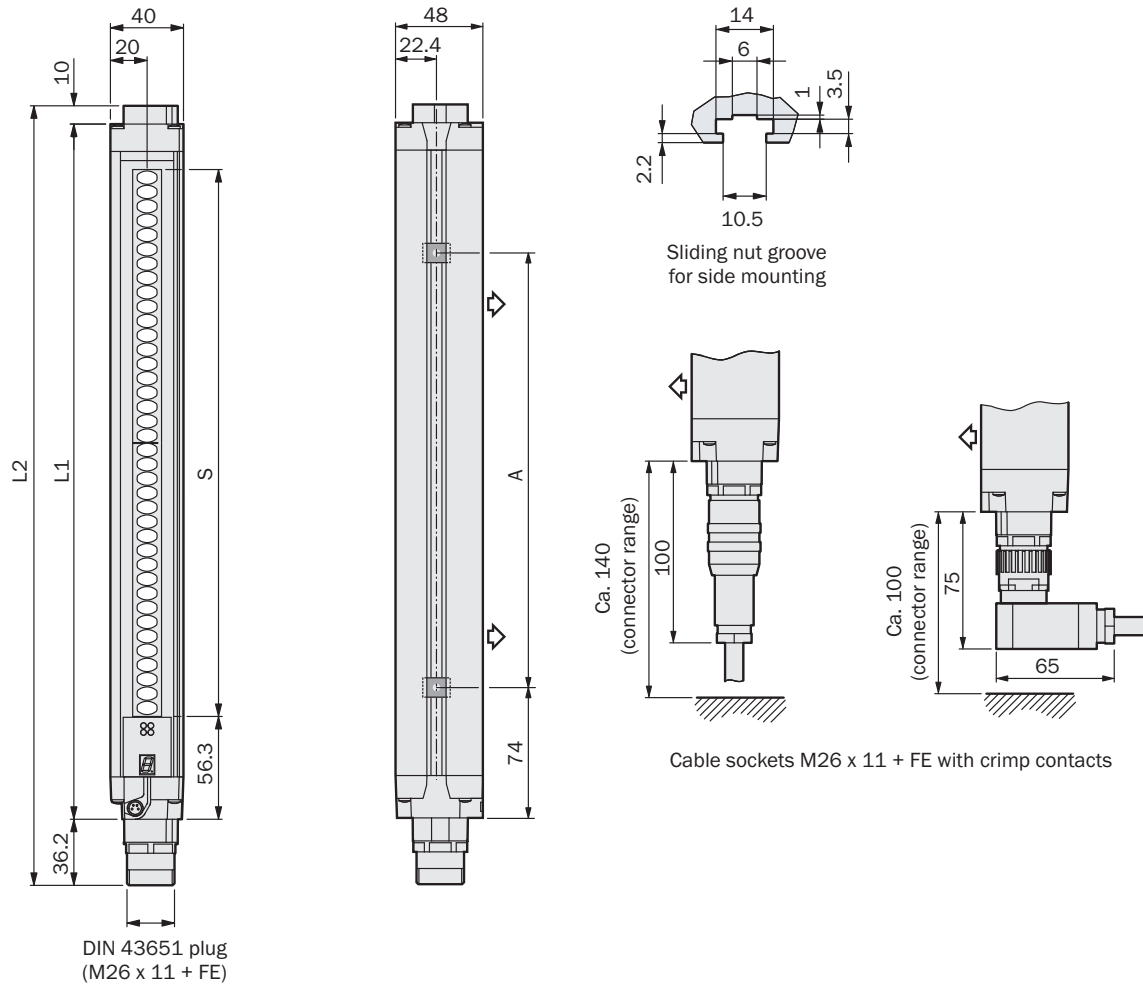


Illustration C4000 without extension connection, sender. Receiver mirror image

Protective field length S	L1	L2	A
750	833	879	674
900	984	1030	824
1050	1134	1180	974
1200	1283	1329	1124
1350	1435	1481	1274
1500	1586	1632	1424
1650	1736	1782	1574
1800	1887	1933	1724

Dimensions in mm

**C4000 Palletizer Advanced, extension connection on receiver**

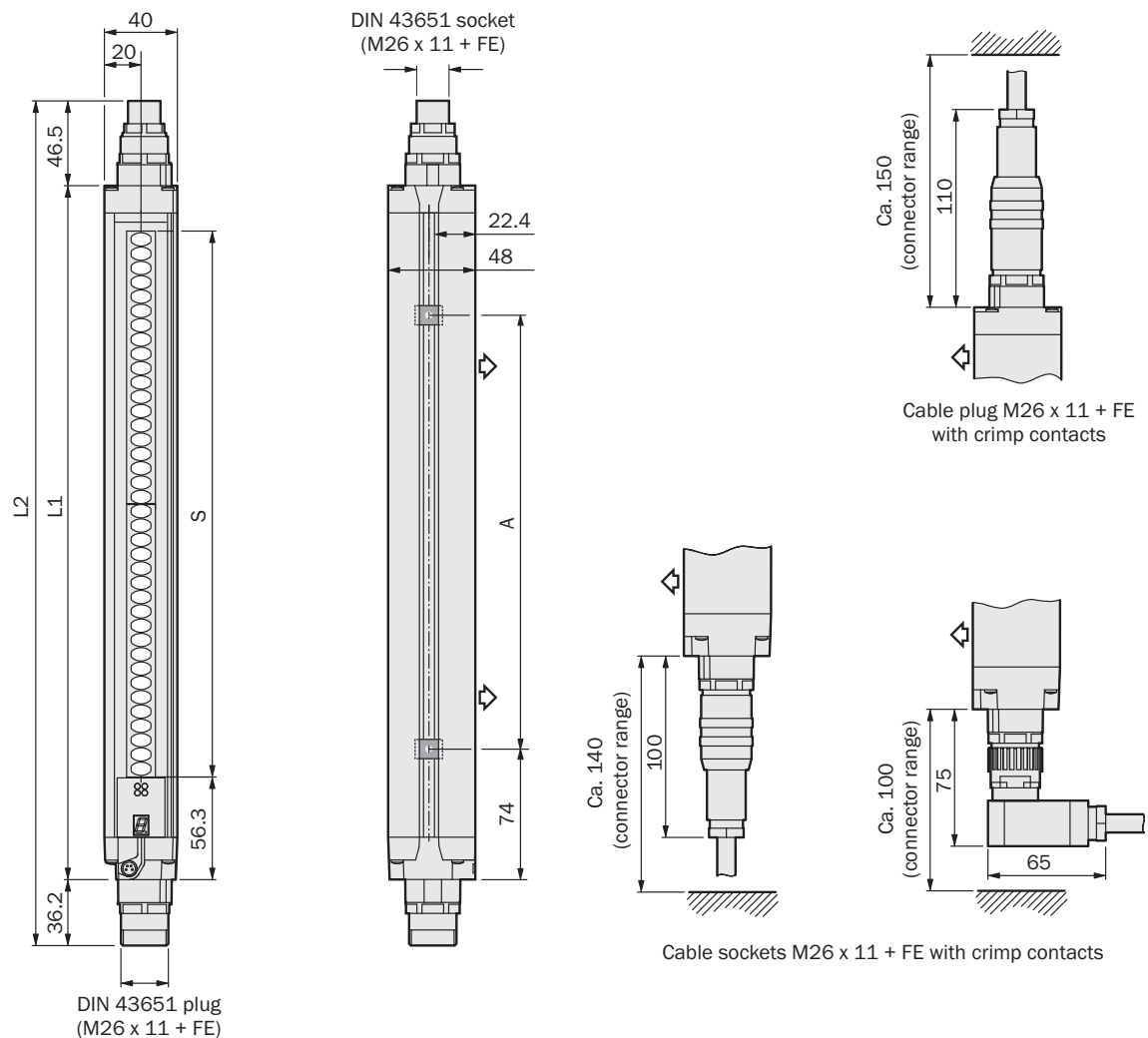
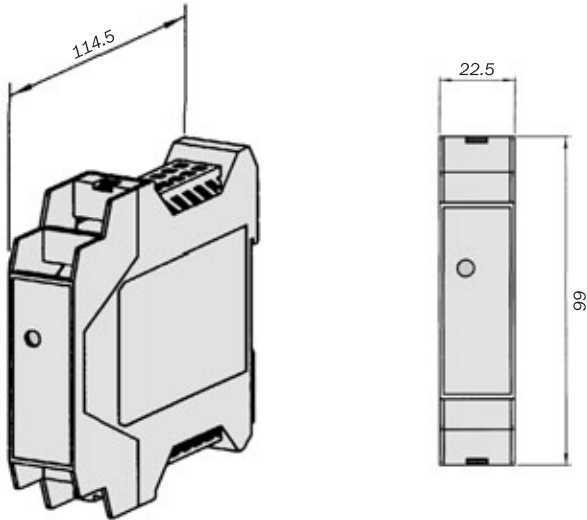


Illustration C4000 with extension connection, sender. Receiver mirror image

Protective field length S	L1	L2	A
750	833	895	674
900	984	1046	824
1050	1134	1196	974
1200	1283	1346	1124
1350	1435	1497	1274
1500	1586	1649	1424
1650	1736	1798	1574
1800	1887	1949	1724

Dimensions in mm

**UE402 switching amplifier**



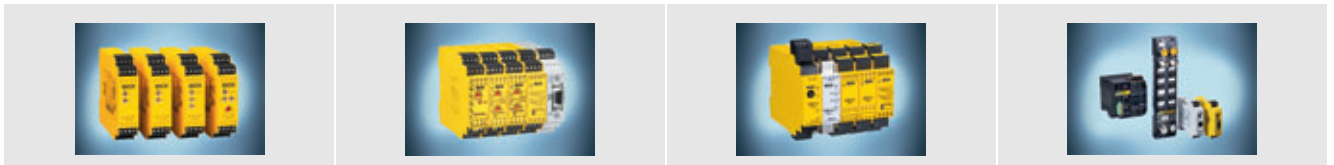
Dimensions in mm

**F**

**Connection diagrams**

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)





**sens:Control – safe control solutions**








Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

**Accessories**

**Mounting systems**


Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659

## Mounting systems (cont'd)


Figure	Property	Packing unit	Type	Part no.
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847
	Stand, for horizontal mounting of C4000 Fusion, Entry/Exit, and Palletizer safety light curtains and M4000 Area multiple light beam safety devices, for mounting heights from 70 mm to 780 mm	2	BEF-3HHOCAST2	2041661

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## Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550



## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	DOL-0612G2M5075KM0	2022544
			5 m	DOL-0612G05M075KM0	2022545
			7.5 m	DOL-0612G7M5075KM0	2022546
			10 m	DOL-0612G10M075KM0	2022547
			15 m	DOL-0612G15M075KM0	2022548
			20 m	DOL-0612G20M075KM0	2022549
			30 m	DOL-0612G30M075KM0	2022550
			50 m	DOL-0612G50MD75KM0	2033548


## Connectors

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable plug M26 x 11 + FE	Straight	STE-0612G000GA3KM0	6021191
		Angled	STE-0612W000GA3KM0	6021192


## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758


## Configuration connection cables

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Additional front screens



Figure	Suitable for protective field height	Part no.
 Example of use	750 mm	2022415
	900 mm	2022416
	1050 mm	2022417
	1200 mm	2022418
	1350 mm	2022419
	1500 mm	2022420
	1650 mm	2022421
	1800 mm	2022422

## Additional heavy-duty front screens

Figure	Suitable for protective field height	Part no.
 Example of use	750 mm	2026856
	900 mm	2026857
	1050 mm	2026858
	1200 mm	2026859
	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863




**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461

**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

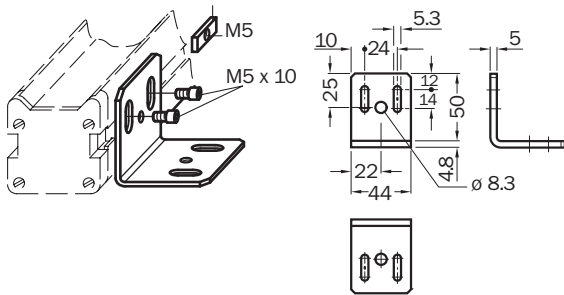
**Configuration tools**

Figure	Description	Type	Part no.
	For saving and transferring configurations. For C4000 Standard, Advanced, Palletizer, Entry/Exit, Fusion and M4000 Advanced, Advanced Curtain, Area	Clone Plug for C4000 and M4000	1029665
		Wall mount	5318443

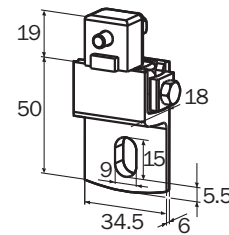


**Dimensional drawings mounting systems**

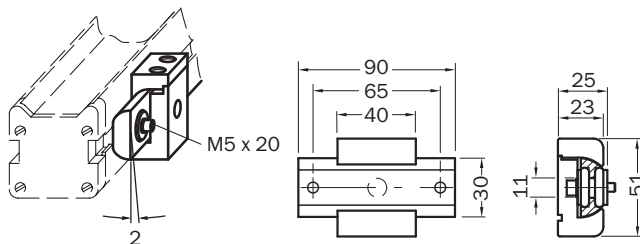
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



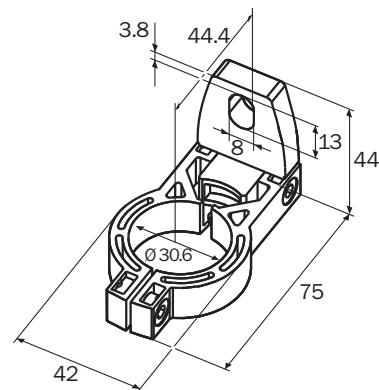
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing

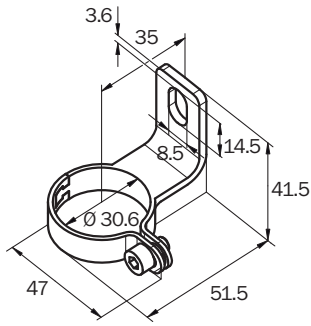


**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount

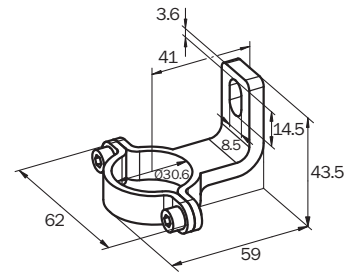


Dimensions in mm

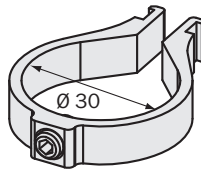
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable

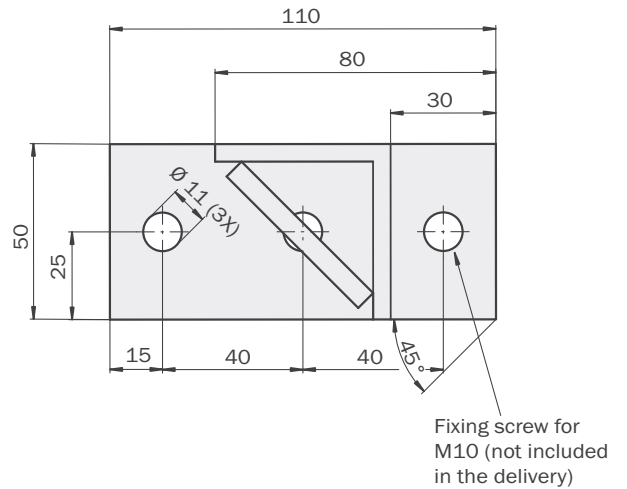
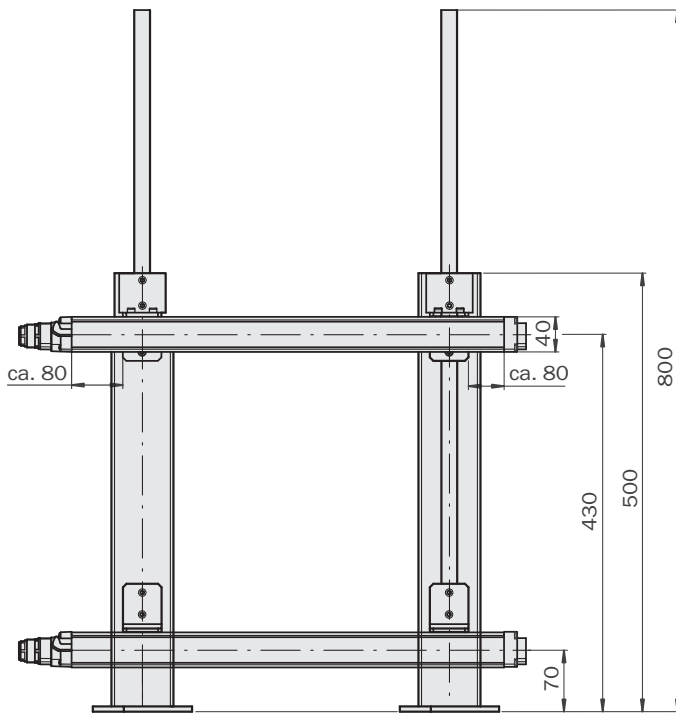


**BEF-2SMMEAAL4**  
Omega bracket, flexible and quick installation with only one screw



F

**BEF-3HHOCAST2**  
Stand, for horizontal mounting



Dimensions in mm

## Technical data overview

Protective field height (depending on type)	300 mm ... 1800 mm
Scanning range	1.5 m ... 19 m
Resolution	20 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The C4000 Fusion safety light curtain provides a variety of functions and expands the field of applications for safety light curtains. It is qualified for compact muting without additional sensors, as well as for highly available hazardous point and area protection. In harsh ambient conditions, the Fusion provides maximum uptime while virtually eliminating false trips.

- **Reliable:** flying wood chips or small debris are filtered, preventing annoying false trips
- **Simple:** for access protection with automated material transport, the C4000 Fusion differentiates between man and material
- **Available:** while skids are being detected, sporadic objects like cables are suppressed

- **Cost-effective:** only one sender / receiver pair, ensuring cost savings during mounting, wiring and service
- **Easily integrated:** no secondary muting sensors necessary, only the OSSDs are implemented
- **Safe:** provides protection in areas in which there is no object, unlike conventional muting solutions
- **Flexible:** individually adjustable to local conditions: sequence monitoring of defined objects of almost any size
- **Position monitoring:** using two single beams out of the curtain
- **The integrated EFl interface** allows the use of additional sensor functions (see A-8).

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Machine tools
- Automotive and other vehicles



Hazardous point protection available regardless of dirt or chips

- Storage and conveyor technology
- Wood industry



Horizontal safety light curtain. No additional muting sensors required



- Reliable hand protection
- Area protection in dirty environments
- Customized access protection with differentiation between man and material
- Reduced resolution
- Fixed blanking
- 2 virtual photoelectric switches
- Multiple sampling
- Integrated laser alignment



Further information	Page
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→ Technical specifications	F-207
→ Dimensional drawings	F-211
→ Connection diagrams	F-214
→ Accessories	F-215
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C4000 Fusion without extension connection

Usage	As a standalone system
Connection types	System connection: Hirschmann plug M26 x 11 + FE Configuration connection: M8 x 4

- Resolution: 20 mm
- Scanning range: 1.5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302FY010	1043224	C40E-0302FY010	1043225
450 mm	C40S-0402FY010	1043226	C40E-0402FY010	1043227
600 mm	C40S-0602FY010	1043228	C40E-0602FY010	1043229
750 mm	C40S-0702FY010	1043183	C40E-0702FY010	1043184
900 mm	C40S-0902FY010	1043185	C40E-0902FY010	1043186
1050 mm	C40S-1002FY010	1043187	C40E-1002FY010	1043189
1200 mm	C40S-1202FY010	1043190	C40E-1202FY010	1043191
1350 mm	C40S-1302FY010	1043192	C40E-1302FY010	1043193
1500 mm	C40S-1502FY010	1043194	C40E-1502FY010	1043195
1650 mm	C40S-1602FY010	1043196	C40E-1602FY010	1043197
1800 mm	C40S-1802FY010	1043198	C40E-1802FY010	1043199

### C4000 Fusion with extension connection<sup>1)</sup> on the receiver

Usage	As a standalone system
Connection types	System connection: Hirschmann plug M26 x 11 + FE Extension connection: Hirschmann socket M26 x 11 + FE Configuration connection: M8 x 4

- Resolution: 20 mm
- Scanning range: 1.5 m ... 19 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
300 mm	C40S-0302FY010	1043224	C40E-0302GY010	1043239
450 mm	C40S-0402FY010	1043226	C40E-0402GY010	1043240
600 mm	C40S-0602FY010	1043228	C40E-0602GY010	1043241
750 mm	C40S-0702FY010	1043183	C40E-0702GY010	1043242
900 mm	C40S-0902FY010	1043185	C40E-0902GY010	1043243
1050 mm	C40S-1002FY010	1043187	C40E-1002GY010	1043244
1200 mm	C40S-1202FY010	1043190	C40E-1202GY010	1043245
1350 mm	C40S-1302FY010	1043192	C40E-1302GY010	1043246
1500 mm	C40S-1502FY010	1043194	C40E-1502GY010	1043247
1650 mm	C40S-1602FY010	1043196	C40E-1602GY010	1043248
1800 mm	C40S-1802FY010	1043198	C40E-1802GY010	1043249

<sup>1)</sup> For reset, "reset required", bypass, emergency stop, teach-in

## UE402 switching amplifier

Description	Type	Part no.
Expands C4000 Standard, Advanced, Palletizer, Entry/Exit and Fusion with the functions described in the technical data, e.g., bypass, operating mode switching or in addition PSDI mode on C4000 Standard, Advanced.	UE402	1023577

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution	20 mm	
Scanning range	1.5 m ... 19 m	
Protective field height (depending on type)	300 mm ... 1800 mm	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$1.5 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 21 ms <sup>1)</sup>
Protection class	III	
Enclosure rating	IP 65	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Integrated laser alignment aid		
Laser class	1, IEC 60825-1:2007 <sup>2)</sup>	-
Light sender/type of light	LED (visible red light)	-
Wave length	650 nm	-

<sup>1)</sup> Without beam coding, with 1 x sampling, no cascaded systems. Other response times, see operating instructions.

<sup>2)</sup> Eye-safe

F

## Functional data: basic functions

	C4000 Fusion without extension connection	C4000 Fusion with extension connection on the receiver
Restart interlock		✓
Restart interlock (delivery status)		External
External device monitoring		✓
External device monitoring (delivery status)		Deactivated
Beam coding		✓
Beam coding (delivery status)		Non-coded
Multiple sampling		✓
Multiple sampling (delivery status)		3 x sampling
Direction monitoring		✓
Reduced resolution		✓
Extension connection	-	✓
Emergency stop / bypass at extension connection	-	✓
Bypass (with UE402)		✓
Operating mode switching (with UE402)		✓
Virtual photoelectric switches	-	✓
Safe device communication via EFI/SDL		✓
SDL interface		✓
Configuration method	PC with CDS (configuration and diagnostic software)	

## Functional data: blanking

	C4000 Fusion without extension connection	C4000 Fusion with extension connection on the receiver
Object entry monitoring		✓
Goods detection		✓
Object size monitoring		✓ <sup>1)</sup>
Teach-in of individual objects		✓
Object gap suppression		✓ <sup>1)</sup>
Pallet detection		✓
Object pattern recognition		✓
Detection of geometrically even objects		✓

<sup>1)</sup> Only in case when blanking of a single object is configured.

## Electrical data

System part	Sender	Receiver
System connection	Hirschmann plug M26 x 11 + FE	
Connecting cable length	Max. 50 m	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Extension connection (depending on type)		Hirschmann socket M26 x 11 + FE
Configuration connection	M8 x 4	
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>1)</sup>	
Residual ripple	$\leq 10\%$ <sup>2)</sup>	
Power consumption	Max. 1 A	Max. 1.8 A
Safety outputs (OSSD)		
	Type of output	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
	Switching voltage HIGH	24 V DC ( $V_S - 2.25$ V DC ... $V_S$ )
	Switching voltage LOW	2 V DC
	Switching current	Max. 500 mA
Display elements	7-segment	

<sup>1)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>2)</sup> Within the limits of  $V_S$ .

## UE402 switching amplifier

## General data

Safety related parameters		
	Type	Type 4 (IEC 61496)
	Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
	Category	Category 4 (EN ISO 13849)
	Performance level	PL e (EN ISO 13849)
	PFHd (mean probability of a dangerous failure per hour)	$15 \times 10^{-9}$ (EN ISO 13849)
	T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Protection class		III (IEC 536:1976)
Enclosure rating		IP 20 (IEC 60529)
Ambient operating temperature from ... to		0 °C ... +55 °C
Air humidity from ... to		15 % ... 95 %, non-condensing
Storage temperature from ... to		-25 °C ... +70 °C
Weight		120 g
Housing material		Plastic

## Functional data

Bypass	✓
Operating mode switching	✓

## Electrical data

Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC)
Residual ripple	≤ 10 %
Power consumption	Max. 110 mA
Switch-on time	Max. 4 s
IN A1 ... A6, MCC-BDC, MCC-TDC	
Switching voltage HIGH	24 V DC (11 V DC ... 30 V DC)
Switching voltage LOW	-30 V DC ... 5 V DC
Switching current HIGH	6 mA ... 20 mA
Switching current LOW	-3 mA ... 0.5 mA
Change over time operating mode selection	Max. 2 s
IN B1, IN B2, OUT B1, OUT B2	
Change over time bypass	Max. 2 s
Synchronous time monitoring	200 ms

## Safety outputs

Connection type	Screw-terminal connector
Conductor cross-section	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

F



## Dimensional drawings

### C4000 Fusion without extension connection

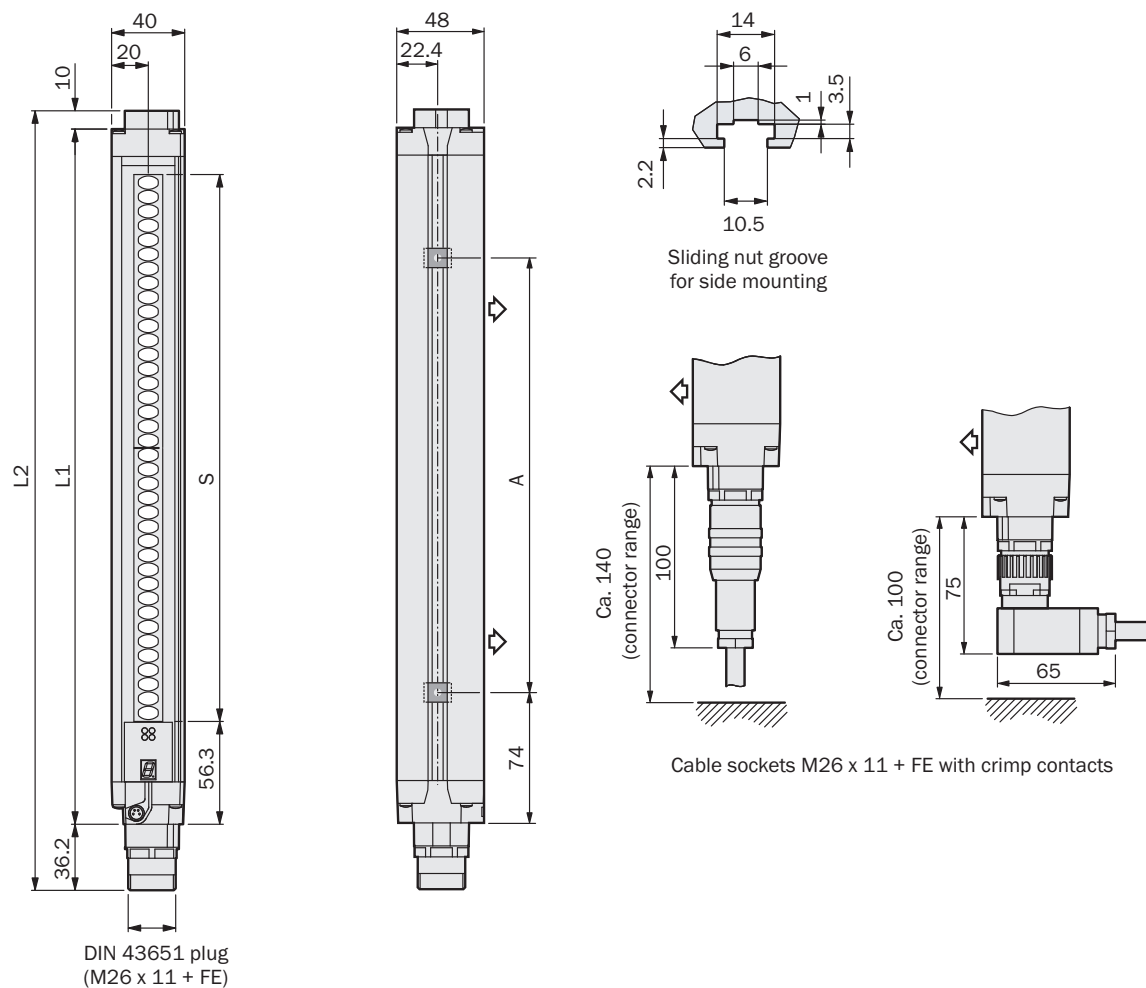


Illustration C4000 without extension connection, sender. Receiver mirror image

Protective field height S	L1	L2	A
300	381	427	224
450	532	578	374
600	682	728	524
750	833	879	674
900	984	1030	824
1050	1134	1180	974
1200	1283	1329	1124
1350	1435	1481	1274
1500	1586	1632	1424
1650	1736	1782	1574
1800	1887	1933	1724

Dimensions in mm

**C4000 Fusion with extension connection**

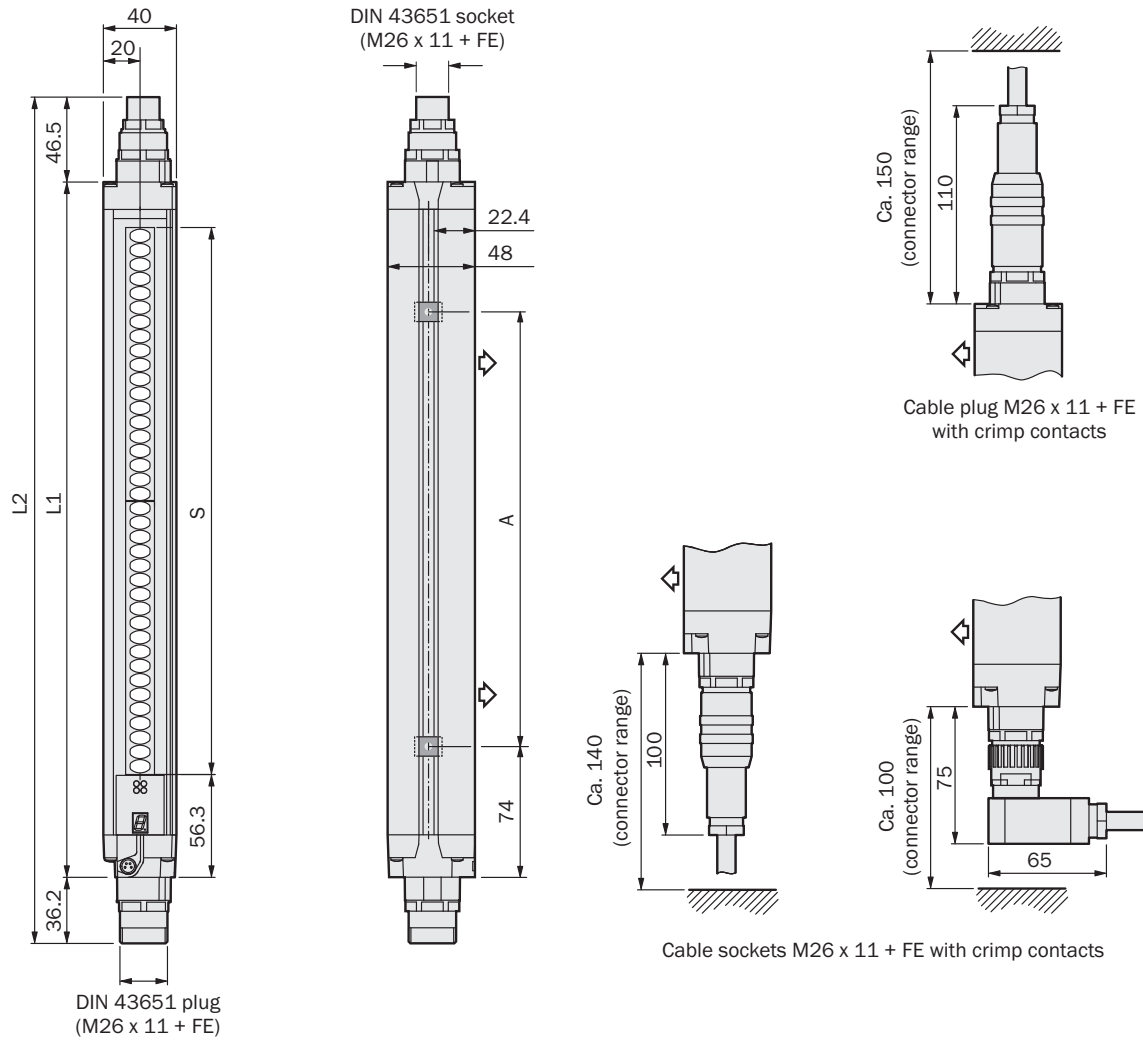
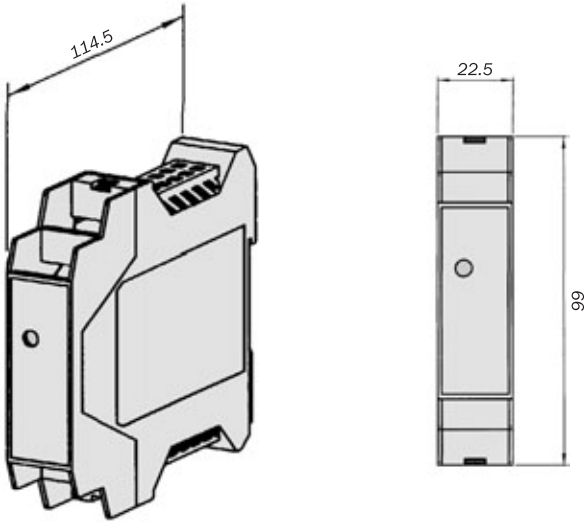


Illustration C4000 with extension connection, sender. Receiver mirror image

Protective field height S	L1	L2	A
300	381	464	224
450	532	614	374
600	682	765	524
750	833	915	674
900	984	1066	824
1050	1134	1216	974
1200	1283	1366	1124
1350	1435	1517	1274
1500	1586	1669	1424
1650	1736	1818	1574
1800	1887	1969	1724

Dimensions in mm

**UE402 switching amplifier**



Dimensions in mm

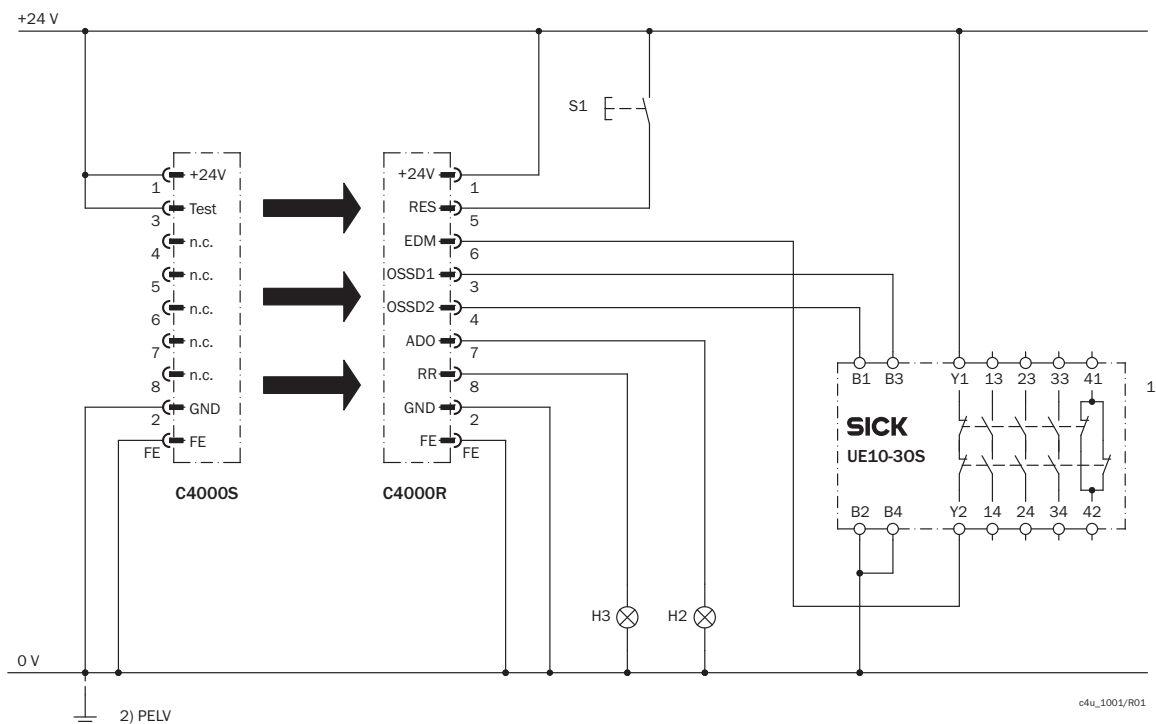


# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## C4000 Fusion on UE10-30S safety relay

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### Task

Connection of a C4000 Standard/Advanced/Palletizer/Fusion safety light curtain to UE10-30S. Operating mode: with restart interlock and external device monitoring.

### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the yellow LED on the receiver and the H3 lamp flash. The system is ready for switch-on. The system is enabled by pressing S1 (button is pressed and released). The OSSD1 and OSSD2 outputs are live and the UE10-30S is switched on. Upon interruption of one or several of the light beams, the UE10-30S is deactivated by the OSSD1 and OSSD2 outputs.

### Fault analysis

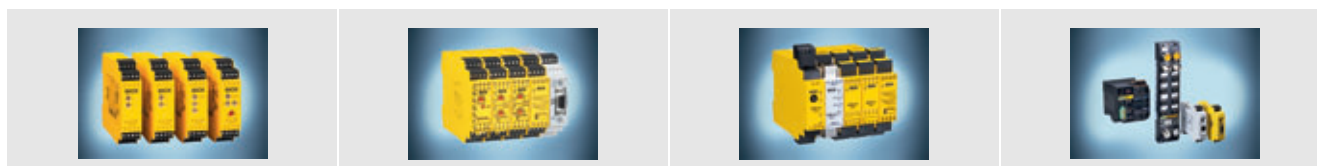
OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of the

UE10-30S will be detected. The shutdown function is retained. On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits. H2 lamp is illuminated if there is contamination (adjustable parameter).

### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
- 2) PELV in accordance with the requirements in EN 60204-1 / 6.4 Take note of the operating instructions of the integrated devices.

## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847
	Mounting kit 11, replacement bracket, suitable for replacement of FGS	4	BEF-3WNGBCST4	2021646
	Stand, for horizontal mounting of C4000 Fusion, Entry/Exit, and Palletizer safety light curtains and M4000 Area multiple light beam safety devices, for mounting heights from 70 mm to 780 mm	2	BEF-3HHOCAST2	2041661



### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600



## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	DOL-0612G2M5075KM0	2022544
			5 m	DOL-0612G05M075KM0	2022545
			7.5 m	DOL-0612G7M5075KM0	2022546
			10 m	DOL-0612G10M075KM0	2022547
			15 m	DOL-0612G15M075KM0	2022548
			20 m	DOL-0612G20M075KM0	2022549
			30 m	DOL-0612G30M075KM0	2022550
			50 m	DOL-0612G50MD75KM0	2033548


## Connectors

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable plug M26 x 11 + FE	Straight	STE-0612G000GA3KM0	6021191
		Angled	STE-0612W000GA3KM0	6021192

## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758


## Configuration connection cables

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649


## Terminators

Description	Remark	Type	Part no.
Terminal with 182 $\Omega$ resistance for pin 9 and 10 on the system connection	For improving the EMC behavior if EFI device communication is not used	Terminal with 182 $\Omega$ resistance	2027227

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

### Device columns with external grooves





Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

### Mirror columns with protective field height mirror

Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0

### Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

**Additional front screens**


Figure	Suitable for protective field height	Part no.
 <p>Example of use</p>	300 mm	2022412
	450 mm	2022413
	600 mm	2022414
	750 mm	2022415
	900 mm	2022416
	1050 mm	2022417
	1200 mm	2022418
	1350 mm	2022419
	1500 mm	2022420
	1650 mm	2022421
	1800 mm	2022422

**Additional heavy-duty front screens**

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Figure	Suitable for protective field height	Part no.
 <p>Example of use</p>	300 mm	2026853
	450 mm	2026854
	600 mm	2026855
	750 mm	2026856
	900 mm	2026857
	1050 mm	2026858
	1200 mm	2026859
	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863

**PNS75 deflector mirrors**



Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
		1800 mm	PNS75-184	1019424



## PNS125 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435


## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731


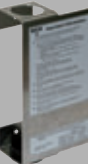
## Configuration software

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

## Configuration tools

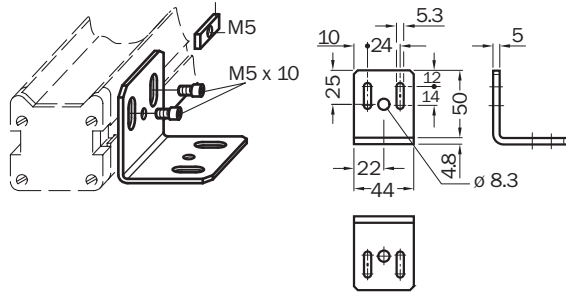
Figure	Description	Type	Part no.
	For saving and transferring configurations. For C4000 Standard, Advanced, Palletizer, Entry/Exit, Fusion and M4000 Advanced, Advanced Curtain, Area	Clone Plug for C4000 and M4000	1029665
		Wall mount	5318443

## Device protection

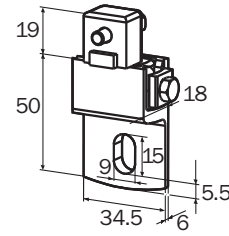
Figure	Description	Type	Part no.
	20 mm diameter	Test rod	2022600
	Test rod holder	BEF-3WNAAAAL1	2052249

Dimensional drawings mounting systems

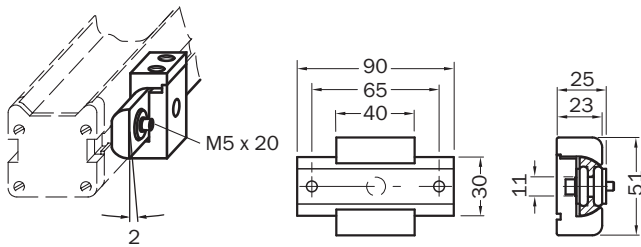
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



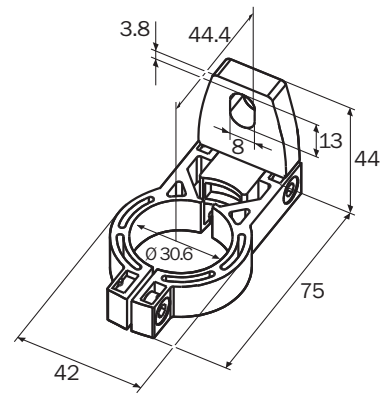
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



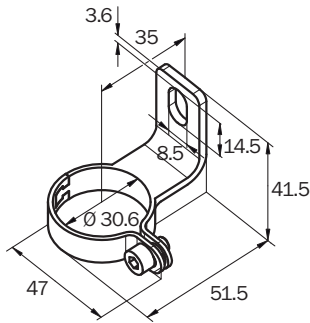
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



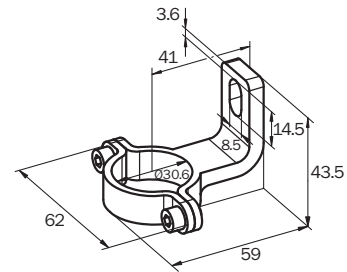
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



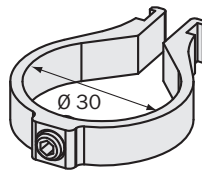
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



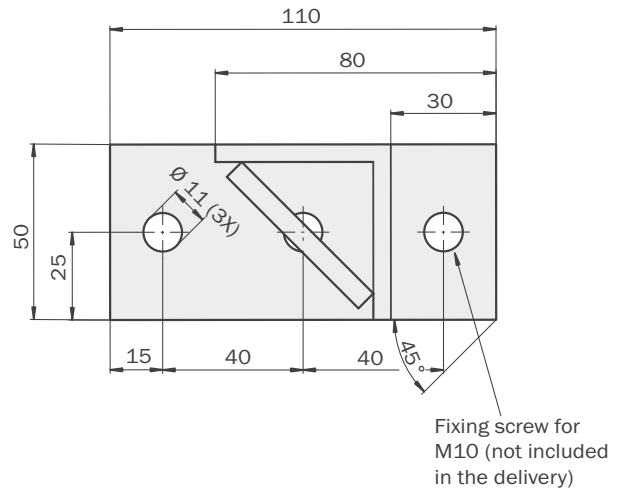
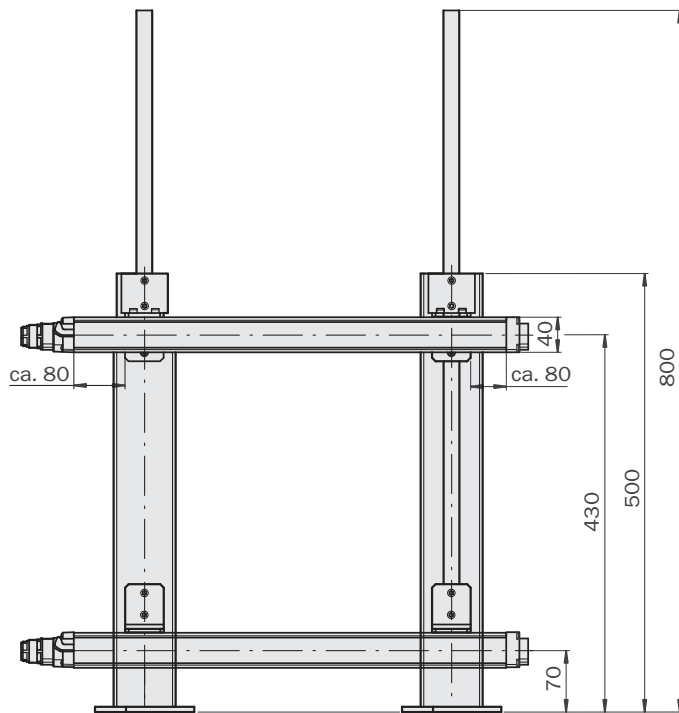
**BEF-2SMMEAAL4, BEF-2SMMEAAL2**  
Omega bracket, flexible and quick installation with only one screw



Dimensions in mm

F

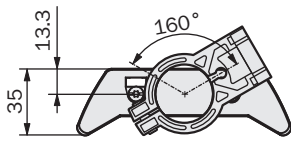
**BEF-3HHOCAST2**  
Stand, for horizontal mounting



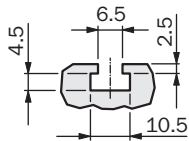
Dimensions in mm



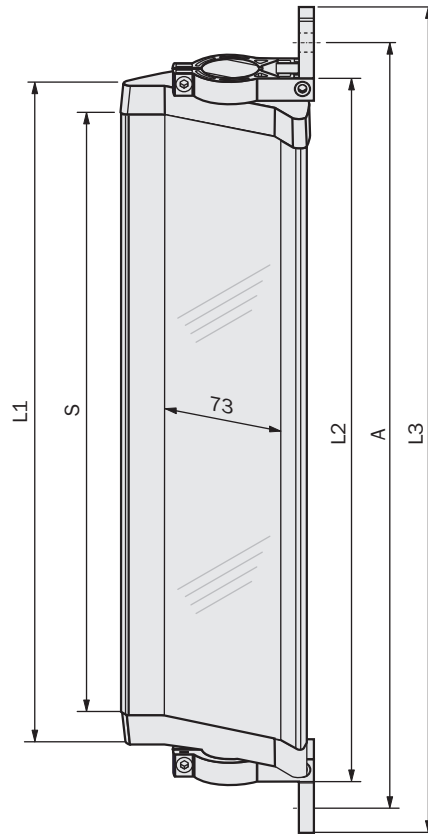
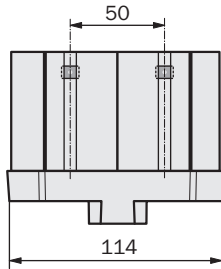
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

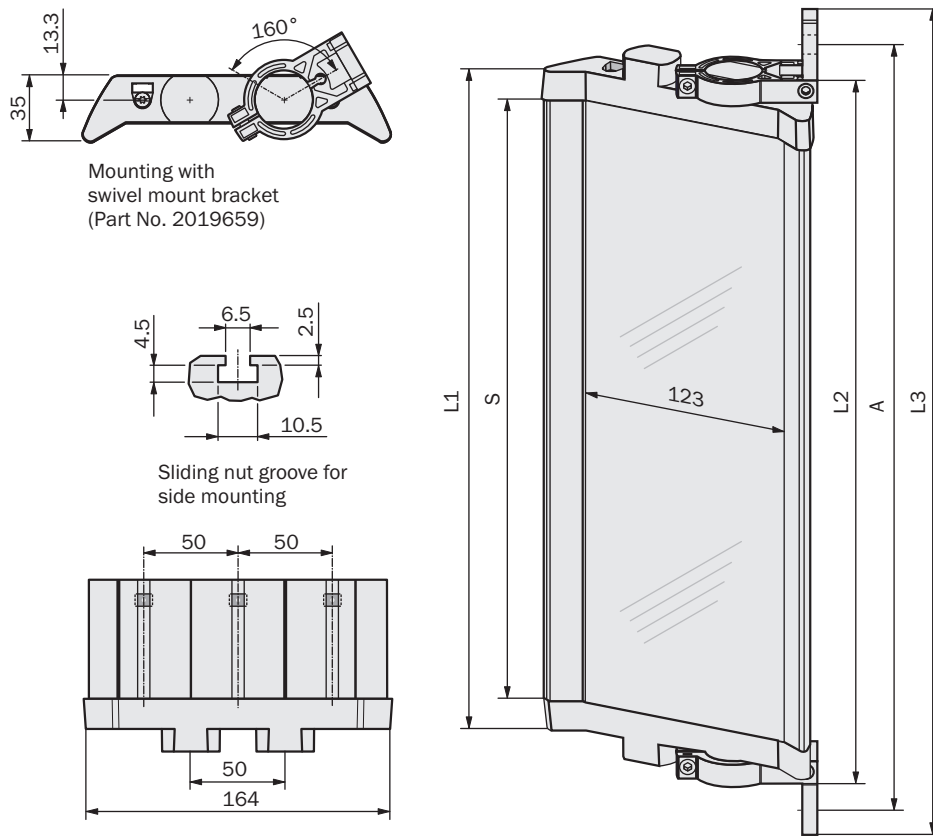


F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

F



F

- Optimal integration due to miniaturization
- Up to 3 systems can be cascaded
- Automatic beam coding
- Alignment and diagnostics via LED display
- External device monitoring (EDM) and reset
- Configuration without PC



## Technical data overview

Protective field height (depending on type)	120 mm ... 1200 mm
Scanning range	Min. 0 m ... 6 m / typ. 0 m ... 8 m
Resolution (depending on type)	14 mm / 24 mm / 34 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508), SILCL2 (IEC 62061)
Enclosure rating	IP 65

## Product description

The miniTwin2 safety light curtain is primarily used for hazardous point protection (finger and hand protection). Thanks to innovative technology, the device offers the customer significant advantages:

- Standardization of the sticks: the innovative Twin Sticks (S/R Stick) reduce the number of system components by up to 50 %. The clear advantages can be seen over the entire life cycle.
- Simplification of the service concept: the simple system construction reduces the effort for training courses and planning the service concept.
- Cost-effective machine integration: very small shape, cascading and fine graduation of the protective field lengths make possible flexible adaptation to the machine design.
- Handling: the simple, software-free commissioning is almost fully automatic. Modern industrial design combines the requirements for intuitive operation with durable appearance.
- The trend toward machines with high quality ergonomic design places special requirements on safety light curtains. For the first time, innovative ideas make it possible to use the optimal safety distance even in positions that were critical in the past.
- Standardization of the accessories: for the first time, innovative solutions make it possible to use additional safety functions on a 5-core cable. Easy to mount brackets ensure space-saving, simple commissioning and provide a cost-effective alternative to the special solutions used in the past.

## In-system added value

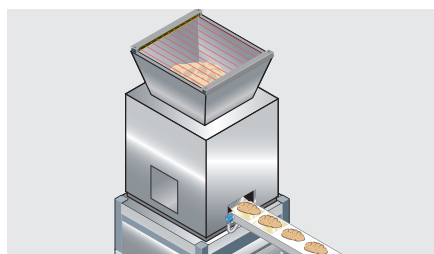
Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	O-2
Flexi Soft	✓	✓	✓	O-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

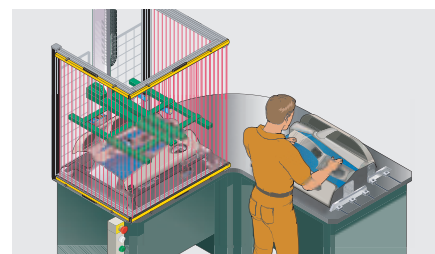
→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)



Food industry: Hazardous point protection at a funnel of a meat skimmer machine

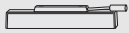
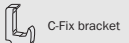
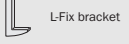
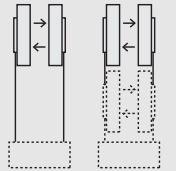


Parts-supplier industry: U-Shape like hazardous point protection at assembly machine

Further information	Page
→ Technical specifications	F-231
→ Dimensional drawings	F-232
→ Connection diagrams	F-232
→ Accessories	F-233
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### miniTwin2 as a standalone device or cascade end unit

Consisting of		Usage
1 x  Twin-Stick 2 x  C-Fix bracket 2 x  L-Fix bracket	<ul style="list-style-type: none"> <li>Twin-Stick with standalone system plug and connecting cable with plug M12 x 4 + FE</li> <li>2 C-Fix brackets with L-Fix bracket</li> <li>Operating instructions on CD-ROM</li> </ul>	 <ul style="list-style-type: none"> <li>As a standalone device</li> <li>As a cascade end unit</li> </ul>
<b>Connection types</b>		System connection: Plug M12 x 4 + FE
<b>Scanning range</b>		
	<b>Minimum</b>	0 m ... 6 m
	<b>Typically</b>	0 m ... 8 m

■ Resolution: 14mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01214BBC03BE0	1207793
180 mm		C2MT-01814BBC03BE0	1207794
240 mm	350 mm	C2MT-02414BBC03DE0	1207795
300 mm		C2MT-03014BBC03DE0	1207796
360 mm		C2MT-03614BBC03DE0	1207797
420 mm		C2MT-04214BBC03DE0	1207798
480 mm		C2MT-04814BBC03DE0	1207799
540 mm		C2MT-05414BBC03DE0	1207800
600 mm		700 mm	C2MT-06014BBC03FE0
660 mm	C2MT-06614BBC03FE0		1207802
720 mm	C2MT-07214BBC03FE0		1207803
780 mm	C2MT-07814BBC03FE0		1207813
840 mm	C2MT-08414BBC03FE0		1207814
900 mm	C2MT-09014BBC03FE0		1207816
960 mm	C2MT-09614BBC03FE0		1207817
1020 mm	C2MT-10214BBC03FE0		1207818
1080 mm	C2MT-10814BBC03FE0		1207819
1140 mm	C2MT-11414BBC03FE0		1207820
1200 mm	C2MT-12014BBC03FE0	1207821	



## ■ Resolution: 24 mm

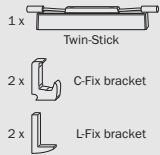
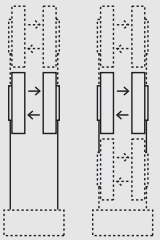
Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01224BBC03BE0	1207822
180 mm		C2MT-01824BBC03BE0	1207823
240 mm	350 mm	C2MT-02424BBC03DE0	1207824
300 mm		C2MT-03024BBC03DE0	1207825
360 mm		C2MT-03624BBC03DE0	1207832
420 mm		C2MT-04224BBC03DE0	1207833
480 mm		C2MT-04824BBC03DE0	1207834
540 mm		C2MT-05424BBC03DE0	1207835
600 mm	700 mm	C2MT-06024BBC03FE0	1207836
660 mm		C2MT-06624BBC03FE0	1207837
720 mm		C2MT-07224BBC03FE0	1207838
780 mm		C2MT-07824BBC03FE0	1207839
840 mm		C2MT-08424BBC03FE0	1207840
900 mm		C2MT-09024BBC03FE0	1207841
960 mm		C2MT-09624BBC03FE0	1207842
1020 mm		C2MT-10224BBC03FE0	1207843
1080 mm		C2MT-10824BBC03FE0	1207844
1140 mm		C2MT-11424BBC03FE0	1207845
1200 mm	C2MT-12024BBC03FE0	1207846	

## ■ Resolution: 34 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01234BBC03BE0	1207847
180 mm		C2MT-01834BBC03BE0	1207848
240 mm	350 mm	C2MT-02434BBC03DE0	1207849
300 mm		C2MT-03034BBC03DE0	1207850
360 mm		C2MT-03634BBC03DE0	1207851
420 mm		C2MT-04234BBC03DE0	1207852
480 mm		C2MT-04834BBC03DE0	1207853
540 mm		C2MT-05434BBC03DE0	1207854
600 mm	700 mm	C2MT-06034BBC03FE0	1207855
660 mm		C2MT-06634BBC03FE0	1207856
720 mm		C2MT-07234BBC03FE0	1207857
780 mm		C2MT-07834BBC03FE0	1207858
840 mm		C2MT-08434BBC03FE0	1207859
900 mm		C2MT-09034BBC03FE0	1207860
960 mm		C2MT-09634BBC03FE0	1207861
1020 mm		C2MT-10234BBC03FE0	1207862
1080 mm		C2MT-10834BBC03FE0	1207863
1140 mm		C2MT-11434BBC03FE0	1207864
1200 mm	C2MT-12034BBC03FE0	1207865	



miniTwin2 as a cascaded host or guest device – not as a cascade end unit

Consisting of		Usage				
 <p>1 x Twin-Stick 2 x C-Fix bracket 2 x L-Fix bracket</p>	<ul style="list-style-type: none"> <li>Twin-Stick with cascade system plug and 2 connecting cables with plug and socket M12 x 4 + FE</li> <li>2 C-Fix brackets with L-Fix bracket</li> <li>Operating instructions on CD-ROM</li> </ul>	 <ul style="list-style-type: none"> <li>As a cascaded host or guest device – not as a cascade end unit</li> </ul>				
<b>Connection types</b>		System connection: Plug M12 x 4 + FE Extension connection: Socket M12 x 4 + FE				
<b>Scanning range</b>		<table border="0"> <tr> <td style="text-align: right;"><b>Minimum</b></td> <td>0 m ... 6 m</td> </tr> <tr> <td style="text-align: right;"><b>Typically</b></td> <td>0 m ... 8 m</td> </tr> </table>	<b>Minimum</b>	0 m ... 6 m	<b>Typically</b>	0 m ... 8 m
<b>Minimum</b>	0 m ... 6 m					
<b>Typically</b>	0 m ... 8 m					

■ Resolution: 14 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01214BBC04BE0	1207866
180 mm		C2MT-01814BBC04BE0	1207867
240 mm	350 mm	C2MT-02414BBC04DE0	1207868
300 mm		C2MT-03014BBC04DE0	1207869
360 mm		C2MT-03614BBC04DE0	1207870
420 mm		C2MT-04214BBC04DE0	1207871
480 mm		C2MT-04814BBC04DE0	1207872
540 mm		C2MT-05414BBC04DE0	1207873
600 mm		700 mm	C2MT-06014BBC04FE0
660 mm	C2MT-06614BBC04FE0		1207875
720 mm	C2MT-07214BBC04FE0		1207876
780 mm	C2MT-07814BBC04FE0		1207877
840 mm	C2MT-08414BBC04FE0		1207878
900 mm	C2MT-09014BBC04FE0		1207879
960 mm	C2MT-09614BBC04FE0		1207880
1020 mm	C2MT-10214BBC04FE0		1207881
1080 mm	C2MT-10814BBC04FE0		1207882
1140 mm	C2MT-11414BBC04FE0		1207883
1200 mm	C2MT-12014BBC04FE0	1207884	



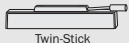

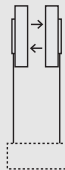
## ■ Resolution: 24 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01224BBC04BE0	1207885
180 mm		C2MT-01824BBC04BE0	1207886
240 mm	350 mm	C2MT-02424BBC04DE0	1207887
300 mm		C2MT-03024BBC04DE0	1207888
360 mm		C2MT-03624BBC04DE0	1207889
420 mm		C2MT-04224BBC04DE0	1207890
480 mm		C2MT-04824BBC04DE0	1207891
540 mm		C2MT-05424BBC04DE0	1207892
600 mm	700 mm	C2MT-06024BBC04FE0	1207893
660 mm		C2MT-06624BBC04FE0	1207894
720 mm		C2MT-07224BBC04FE0	1207895
780 mm		C2MT-07824BBC04FE0	1207896
840 mm		C2MT-08424BBC04FE0	1207897
900 mm		C2MT-09024BBC04FE0	1207898
960 mm		C2MT-09624BBC04FE0	1207899
1020 mm		C2MT-10224BBC04FE0	1207900
1080 mm		C2MT-10824BBC04FE0	1207901
1140 mm		C2MT-11424BBC04FE0	1207902
1200 mm	C2MT-12024BBC04FE0	1207903	

## ■ Resolution: 34 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01234BBC04BE0	1207904
180 mm		C2MT-01834BBC04BE0	1207905
240 mm	350 mm	C2MT-02434BBC04DE0	1207906
300 mm		C2MT-03034BBC04DE0	1207907
360 mm		C2MT-03634BBC04DE0	1207908
420 mm		C2MT-04234BBC04DE0	1207909
480 mm		C2MT-04834BBC04DE0	1207910
540 mm		C2MT-05434BBC04DE0	1207911
600 mm	700 mm	C2MT-06034BBC04FE0	1207912
660 mm		C2MT-06634BBC04FE0	1207913
720 mm		C2MT-07234BBC04FE0	1207914
780 mm		C2MT-07834BBC04FE0	1207915
840 mm		C2MT-08434BBC04FE0	1207916
900 mm		C2MT-09034BBC04FE0	1207917
960 mm		C2MT-09634BBC04FE0	1207918
1020 mm		C2MT-10234BBC04FE0	1207919
1080 mm		C2MT-10834BBC04FE0	1207920
1140 mm		C2MT-11434BBC04FE0	1207921
1200 mm	C2MT-12034BBC04FE0	1207922	

## miniTwin2 as a standalone device

Consisting of		Usage	
1 x  Twin-Stick 2 x  O-Fix bracket	<ul style="list-style-type: none"> <li>Twin-Stick with standalone system plug and 1 connecting cable with plug M12 x 4 + FE</li> <li>2 O-Fix brackets</li> <li>Operating instructions on CD-ROM</li> </ul>		<ul style="list-style-type: none"> <li>As a standalone device</li> </ul>
<b>Connection types</b>		System connection: Plug M12 x 4 + FE	
<b>Scanning range</b>			
	<b>Minimum</b>	0 m ... 6 m	
	<b>Typically</b>	0 m ... 8 m	

■ Resolution: 14 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01214BBC03BB0	1207923
180 mm		C2MT-01814BBC03BB0	1207924
240 mm	350 mm	C2MT-02414BBC03DB0	1207925
300 mm		C2MT-03014BBC03DB0	1207926
360 mm		C2MT-03614BBC03DB0	1207927
420 mm		C2MT-04214BBC03DB0	1207928
480 mm		C2MT-04814BBC03DB0	1207929
540 mm		C2MT-05414BBC03DB0	1207930
600 mm	700 mm	C2MT-06014BBC03FB0	1207931
660 mm		C2MT-06614BBC03FB0	1207932
720 mm		C2MT-07214BBC03FB0	1207933
780 mm		C2MT-07814BBC03FB0	1207934
840 mm		C2MT-08414BBC03FB0	1207935
900 mm		C2MT-09014BBC03FB0	1207936
960 mm		C2MT-09614BBC03FB0	1207937
1020 mm		C2MT-10214BBC03FB0	1207938
1080 mm		C2MT-10814BBC03FB0	1207939
1140 mm		C2MT-11414BBC03FB0	1207940
1200 mm	C2MT-12014BBC03FB0	1207941	



## ■ Resolution: 24 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01224BBC03BB0	1207942
180 mm		C2MT-01824BBC03BB0	1207943
240 mm	350 mm	C2MT-02424BBC03DB0	1207944
300 mm		C2MT-03024BBC03DB0	1207945
360 mm		C2MT-03624BBC03DB0	1207946
420 mm		C2MT-04224BBC03DB0	1207947
480 mm		C2MT-04824BBC03DB0	1207948
540 mm		C2MT-05424BBC03DB0	1207949
600 mm	700 mm	C2MT-06024BBC03FB0	1207950
660 mm		C2MT-06624BBC03FB0	1207951
720 mm		C2MT-07224BBC03FB0	1207952
780 mm		C2MT-07824BBC03FB0	1207953
840 mm		C2MT-08424BBC03FB0	1207954
900 mm		C2MT-09024BBC03FB0	1207955
960 mm		C2MT-09624BBC03FB0	1207956
1020 mm		C2MT-10224BBC03FB0	1207957
1080 mm		C2MT-10824BBC03FB0	1207958
1140 mm		C2MT-11424BBC03FB0	1207959
1200 mm	C2MT-12024BBC03FB0	1207960	

## ■ Resolution: 34 mm

Protective field height	Cable length	Type	Part no.
120 mm	160 mm	C2MT-01234BBC03BB0	1207961
180 mm		C2MT-01834BBC03BB0	1207962
240 mm	350 mm	C2MT-02434BBC03DB0	1207963
300 mm		C2MT-03034BBC03DB0	1207964
360 mm		C2MT-03634BBC03DB0	1207965
420 mm		C2MT-04234BBC03DB0	1207966
480 mm		C2MT-04834BBC03DB0	1207967
540 mm		C2MT-05434BBC03DB0	1207968
600 mm	700 mm	C2MT-06034BBC03FB0	1207969
660 mm		C2MT-06634BBC03FB0	1207970
720 mm		C2MT-07234BBC03FB0	1207971
780 mm		C2MT-07834BBC03FB0	1207972
840 mm		C2MT-08434BBC03FB0	1207973
900 mm		C2MT-09034BBC03FB0	1207974
960 mm		C2MT-09634BBC03FB0	1207975
1020 mm		C2MT-10234BBC03FB0	1207976
1080 mm		C2MT-10834BBC03FB0	1207977
1140 mm		C2MT-11434BBC03FB0	1207978
1200 mm	C2MT-12034BBC03FB0	1207979	

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

Scanning range	0 m ... 6 m
Protective field height (depending on type)	120 mm ... 1200 mm
Safety related parameters (depending on type)	
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)
Category	Category 2 (EN ISO 13849)
Test rate (internal test)	Standalone system: 58/s (EN ISO 13849) Cascaded systems: 47/s (EN ISO 13849)
Maximum demand rate	Standalone system: 34/min (EN ISO 13849) <sup>1)</sup> Cascaded systems: 28/min (EN ISO 13849) <sup>1)</sup>
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>
PFHd (mean probability of a dangerous failure per hour)	Standalone system: $2.4 \times 10^{-8}$ (EN ISO 13849) Cascaded systems: $5.2 \times 10^{-8}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Response time (depending on type)	Max. 17 ms <sup>3)</sup>
Synchronization	Optical, without separate synchronization
Protection class	III (EN 61140)
Enclosure rating	IP 65
Ambient operating temperature from ... to	-20 °C ... +55 °C
Storage temperature from ... to	-25 °C ... +70 °C
Air humidity from ... to	15 % ... 95 %, non-condensing
Housing cross-section (incl. system connection)	15 mm x 32 mm
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 60068-2-6
Shock resistance	10 g, 16 s (IEC 60068-2-29)

<sup>1)</sup> Between two demands on a safety-related response of the device at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics.  
For more detailed information on this topic see page A-10

<sup>3)</sup> Standalone devices, no cascaded systems. Other response times, see operating instructions.

### Functional data

Restart interlock	✓
External device monitoring	✓
Beam coding	Automatic
Extension connection (depending on type)	✓
Configuration method	Hard wired

Electrical data

System connection	Plug M12 x 4 + FE
Connecting cable length	Max. 20 m <sup>1)</sup>
Connecting cable wire cross-section	0.34 mm <sup>2</sup>
Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC)
Residual ripple	± 10 %
Switch-on time	Max. 3 s <sup>2)</sup>
Display elements	LED

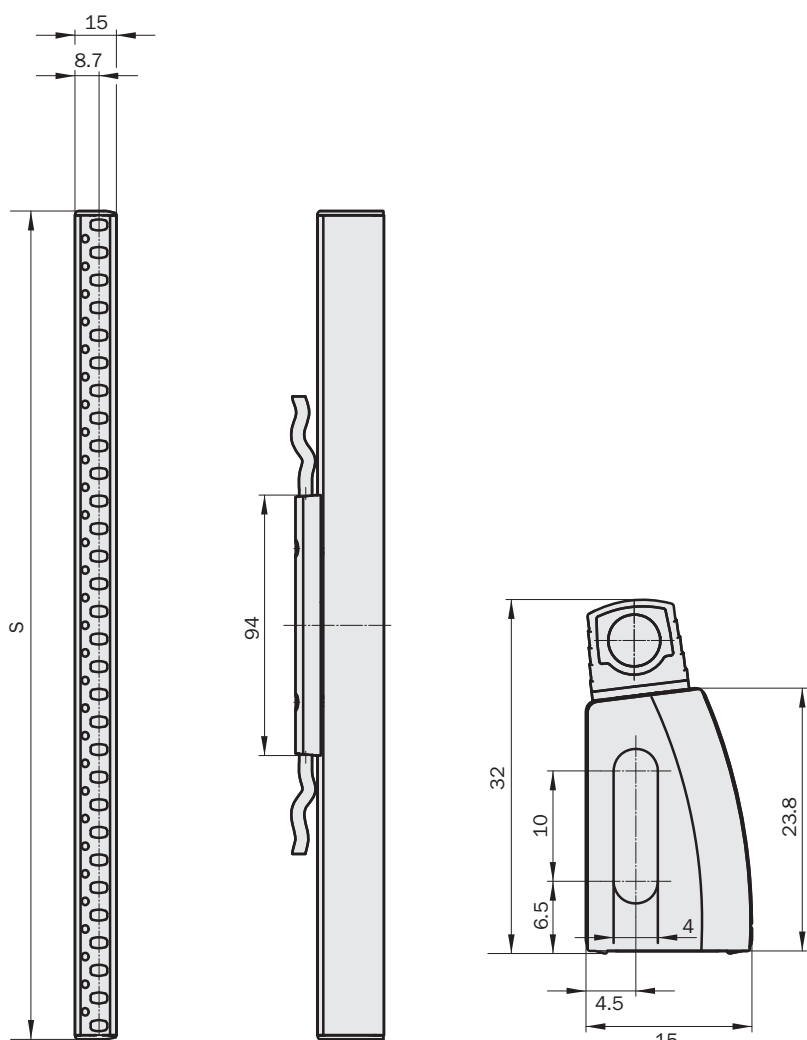
<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> After applying the supply voltage

Dimensional drawings

miniTwin2

F



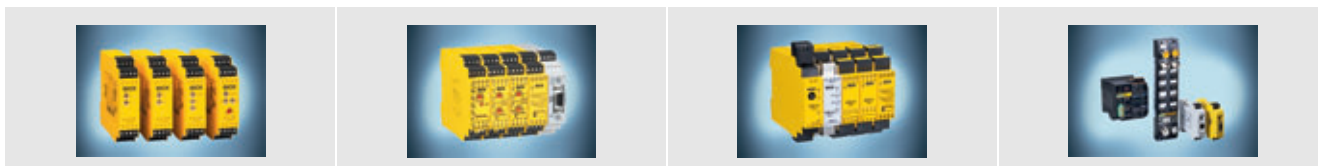
S = protective field height = housing length

Dimensions in mm

Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)




## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories




### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Combination C-Fix bracket with L-Fix bracket	2	BEF-3AAA0MKU2S04	2045843
	O-Fix bracket	2	BEF-3SHAEMKU2	2045835
	C-Fix-Flex bracket, adjustable +4° / -4°, metal version, for flat and connector side assembly	2	BEF-1SHABMAL2	2056598


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


### System plugs

Figure	Description	Cable length	Type	Part no.
	With 1 connecting cable, stripped	10 m	Standalone system plug	2051290
	With 1 connecting cable and plug M12 x 4 + FE	160 mm	Standalone system plug	2046447
		350 mm	Standalone system plug	2046449
		700 mm	Standalone system plug	2046451
	With 2 connecting cables and 1 plug and 1 socket M12 x 4 + FE	160 mm	Cascade system plug	2046452
		350 mm	Cascade system plug	2046454
		700 mm	Cascade system plug	2046456

### Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 5	Straight	2 m	DOL-1205-G02M	6008899
			5 m	DOL-1205-G05M	6009868
			10 m	DOL-1205-G10M	6010544
			15 m	DOL-1205-G15M	6029215
			20 m	DOL-1205-G20MAC	6036386


**Connector**

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Plug M12 x 5	Straight	STE-1205-G	6022083


**Cable receptacles**

Connection type	Direction of cable outlet	Type	Part no.
Socket M12 x 5	Straight	DOS-1205-G	6009719

**Extension connection cables**

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Plug M12 x 5, socket M12 x 5	Plug straight/ socket straight	1 m	DSL-1205-G01MC	6029280
			2 m	DSL-1205-G02MC	6025931


**PNS75 deflector mirrors**

Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
		1800 mm	PNS75-184	1019424

**PNS125 deflector mirrors**



Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435

**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter AR60 for miniTwin	-	-	-	4064710



**Device protection**

Figure	Description	Type	Part no.
	14 mm diameter	Test rod	2022599
	24 mm diameter	Test rod	2045592
	34 mm diameter	Test rod	2045593
	Test rod holder	BEF-3WNAAAAL1	2052249

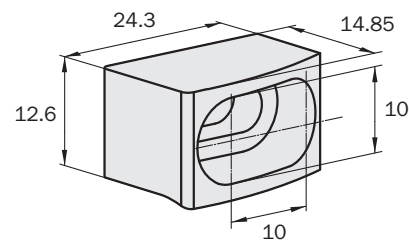
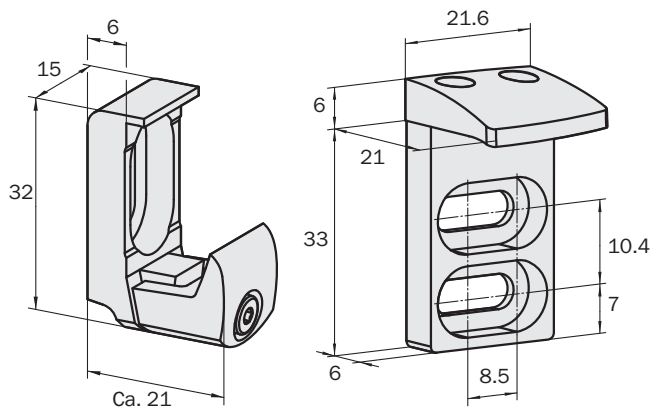
**Dimensional drawings mounting systems**

**BEF-3AAA0MKU2S04**

Combination C-Fix bracket with L-Fix bracket, 2 pieces each

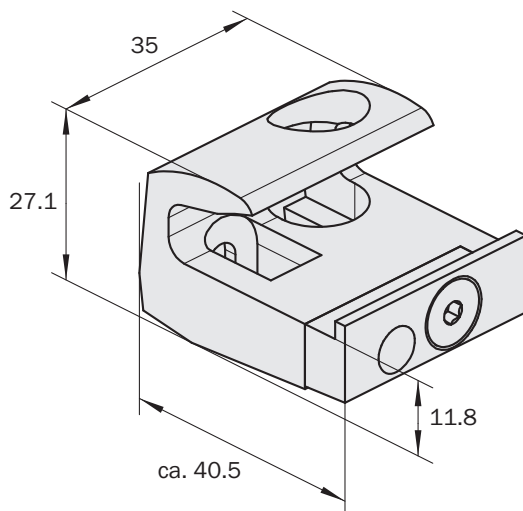
**BEF-3SHAEMKU2**

O-Fix bracket, 2 pieces



**BEF-1SHABMAL2**

C-Fix-Flex bracket, adjustable +4°/-4°, metal version, for flat and connector side assembly



Dimensions in mm

F



F

- External device monitoring (EDM)
- Self-test
- 7-segment display
- Diagnostics
- Alignment aid
- Beam coding



## Technical data overview

Protective field height (depending on type)	150 mm ... 1800 mm
Scanning range (depending on type)	0 m ... 6 m / 2.5 m ... 19 m
Resolution (depending on type)	20 mm / 30 mm / 40 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)
Enclosure rating	IP 65

## Product description

With its high signal reserve, the C2000 Standard safety light curtain is also reliable under harsh industrial conditions. Functions and status information integrated in the device allows rapid commissioning and prevents unnecessary machine downtime. Its modular design achieves maximum machine safety while taking into account

economic considerations by precisely coordinating the characteristics of the device to the requirements. Safe control solutions and service concepts complete the product range to provide an ideal solution.

## In-system added value

Combined with SICK safe control solutions

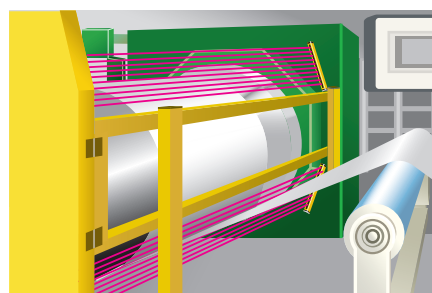
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	O-2
Flexi Soft	✓	✓	✓	O-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

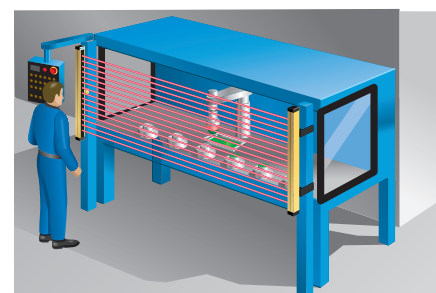
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Storage and conveyor technology
- Wood industry
- Textile industry
- Stone production
- Electronics industry
- Packaging industry



Textile industry: C2000 Standard on a warping machine



Printing industry: C2000 Standard on a pad printing machine

Further information	Page
→ Technical specifications	F-239
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→ Connection diagrams	F-243
→ Accessories	F-244
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C2000 Standard

<b>Housing cross-section</b>	
<b>Protective field heights 150 mm to 1200 mm</b>	34 mm x 29 mm
<b>Protective field heights 1350 mm to 1800 mm</b>	48 mm x 40 mm
<b>Usage</b>	As a standalone system
<b>Connection types</b>	System connection: plug M12 x 8

■ Scanning range: 0 m ... 6 m

Resolution	Protective field height	Sender		Receiver	
		Type	Part no.	Type	Part no.
20 mm	150 mm	C20S-015102A11	1016563	C20E-015302A11	1016564
	300 mm	C20S-030102A11	1016448	C20E-030302A11	1016449
	450 mm	C20S-045102A11	1016573	C20E-045302A11	1016459
	600 mm	C20S-060102A11	1016574	C20E-060302A11	1016575
	750 mm	C20S-075102A11	1016579	C20E-075302A11	1016580
	900 mm	C20S-090102A11	1016584	C20E-090302A11	1016585
	1050 mm	C20S-105102A11	1016589	C20E-105302A11	1016590
30 mm	1200 mm	C20S-120102A11	1016464	C20E-120302A11	1016465
	150 mm	C20S-015103A11	1016475	C20E-015303A11	1016476
	300 mm	C20S-030103A11	1016568	C20E-030303A11	1016569
	450 mm	C20S-045103A11	1016454	C20E-045303A11	1016455
	600 mm	C20S-060103A11	1016477	C20E-060303A11	1016478
	750 mm	C20S-075103A11	1016479	C20E-075303A11	1016480
	900 mm	C20S-090103A11	1016481	C20E-090303A11	1016482
	1050 mm	C20S-105103A11	1016483	C20E-105303A11	1016484
	1200 mm	C20S-120103A11	1016594	C20E-120303A11	1016595
	1350 mm	C20S-135103A12	1016600	C20E-135303A12	1016601
	1500 mm	C20S-150103A12	1016605	C20E-150303A12	1016606
40 mm	1650 mm	C20S-165103A12	1016610	C20E-165303A12	1016611
	1800 mm	C20S-180103A12	1016615	C20E-180303A12	1016616
	150 mm	C20S-015104A11	1016565	C20E-015304A11	1016566
	300 mm	C20S-030104A11	1016570	C20E-030304A11	1016571
	450 mm	C20S-045104A11	1016456	C20E-045304A11	1016457
	600 mm	C20S-060104A11	1016576	C20E-060304A11	1016577
	750 mm	C20S-075104A11	1016581	C20E-075304A11	1016582
	900 mm	C20S-090104A11	1016586	C20E-090304A11	1016587
	1050 mm	C20S-105104A11	1016591	C20E-105304A11	1016592
	1200 mm	C20S-120104A11	1016596	C20E-120304A11	1016597
	1350 mm	C20S-135104A12	1016603	C20E-135304A12	1016604
1500 mm	C20S-150104A12	1016608	C20E-150304A12	1016609	
1650 mm	C20S-165104A12	1016613	C20E-165304A12	1016614	
1800 mm	C20S-180104A12	1016618	C20E-180304A12	1016619	

F

■ Scanning range: 2.5 m ... 19 m

F

Resolution	Protective field height	Sender		Receiver	
		Type	Part no.	Type	Part no.
20 mm	150 mm	C20S-015202A11	1016631	C20E-015302A11	1016564
	300 mm	C20S-030202A11	1016632	C20E-030302A11	1016449
	450 mm	C20S-045202A11	1016458	C20E-045302A11	1016459
	600 mm	C20S-060202A11	1016633	C20E-060302A11	1016575
	750 mm	C20S-075202A11	1016634	C20E-075302A11	1016580
	900 mm	C20S-090202A11	1016635	C20E-090302A11	1016585
	1050 mm	C20S-105202A11	1016636	C20E-105302A11	1016590
	1200 mm	C20S-120202A11	1016466	C20E-120302A11	1016465
30 mm	150 mm	C20S-015203A11	1016567	C20E-015303A11	1016476
	300 mm	C20S-030203A11	1016572	C20E-030303A11	1016569
	450 mm	C20S-045203A11	1016460	C20E-045303A11	1016455
	600 mm	C20S-060203A11	1016578	C20E-060303A11	1016478
	750 mm	C20S-075203A11	1016583	C20E-075303A11	1016480
	900 mm	C20S-090203A11	1016588	C20E-090303A11	1016482
	1050 mm	C20S-105203A11	1016593	C20E-105303A11	1016484
	1200 mm	C20S-120203A11	1016599	C20E-120303A11	1016595
	1350 mm	C20S-135203A12	1016602	C20E-135303A12	1016601
	1500 mm	C20S-150203A12	1016607	C20E-150303A12	1016606
	1650 mm	C20E-165303A12	1016611	C20S-165203A12	1016612
	1800 mm	C20S-180203A12	1016617	C20E-180303A12	1016616
40 mm	150 mm	C20S-015204A11	1016637	C20E-015304A11	1016566
	300 mm	C20S-030204A11	1016638	C20E-030304A11	1016571
	450 mm	C20S-045204A11	1016462	C20E-045304A11	1016457
	600 mm	C20S-060204A11	1016639	C20E-060304A11	1016577
	750 mm	C20S-075204A11	1016640	C20E-075304A11	1016582
	900 mm	C20S-090204A11	1016641	C20E-090304A11	1016587
	1050 mm	C20S-105204A11	1016642	C20E-105304A11	1016592
	1200 mm	C20S-120204A11	1016643	C20E-120304A11	1016597
	1350 mm	C20S-135204A12	1016644	C20E-135304A12	1016604
	1500 mm	C20E-150304A12	1016609	C20S-150204A12	1016646
	1650 mm	C20S-165204A12	1016647	C20E-165304A12	1016614
	1800 mm	C20S-180204A12	1016648	C20E-180304A12	1016619

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	20 mm / 30 mm / 40 mm	
Scanning range (depending on type)	0 m ... 6 m / 2.5 m ... 19 m	-
Protective field height (depending on type)	150 mm ... 1800 mm	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	2.2 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 34 ms
Synchronization	Optical, without separate synchronization	
Protection class	III	
Enclosure rating	IP 65 (EN 60529)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section (depending on type)		
Protective field heights 150 mm to 1200 mm	34 mm x 29 mm	
Protective field heights 1350 mm to 1800 mm	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	
Shock resistance	10 g, 16 ms (IEC 68-2-29)	

<sup>1)</sup> Between two demands on a safety-related response of the device at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics.  
For more detailed information on this topic, see page A-10.

### Functional data

System part	Sender	Receiver
External device monitoring	-	✓
Beam coding		✓
Configuration method	Hard wired	

## Electrical data

System part	Sender	Receiver
System connection	Plug M12 x 8	
Connecting cable length	Max. 15 m <sup>1)</sup>	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 5 %	
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	Min. $V_S - 2.25$ V DC
Switching current	-	Max. 500 mA
Display elements	LED/7-segment	

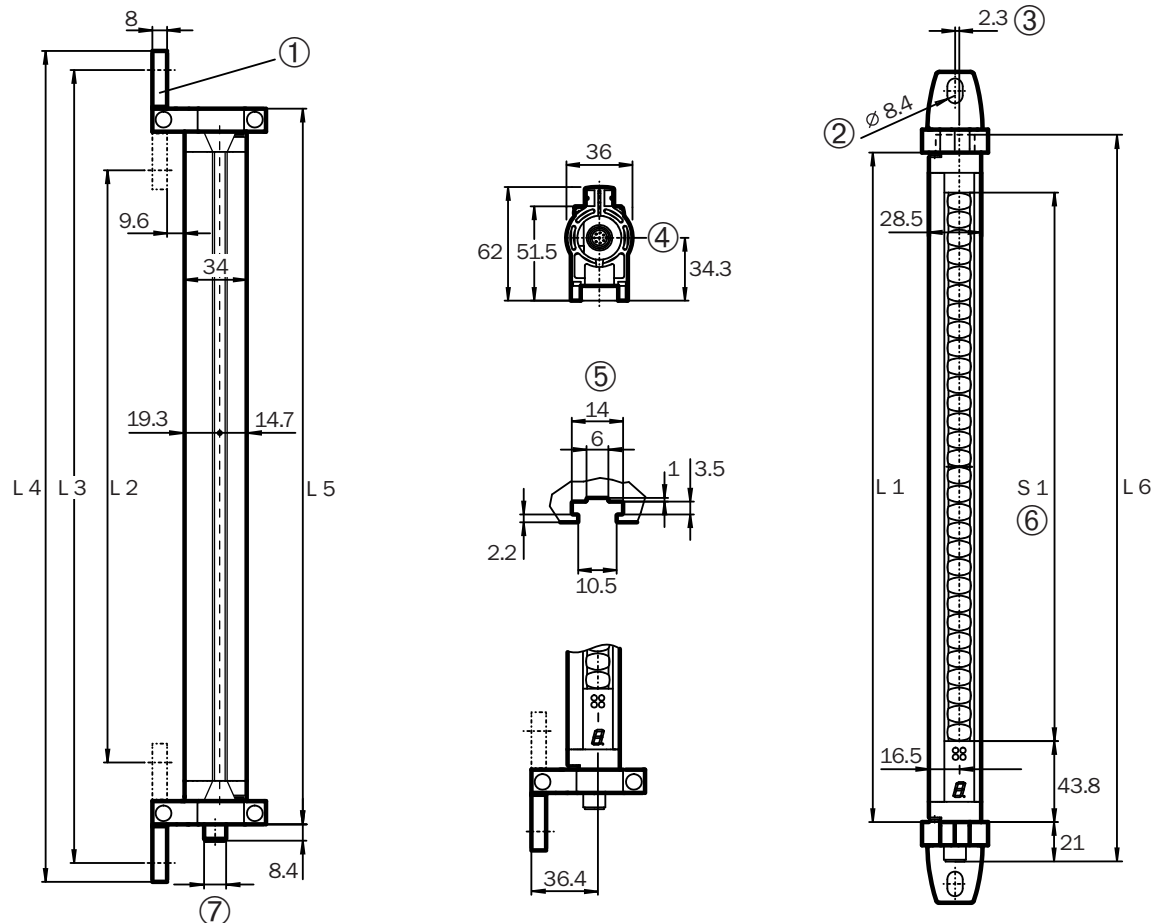
<sup>1)</sup> The length of the connecting cable is limited, because wire resistance is max. 4 Ohm.

<sup>2)</sup> Upper and lower limit values of voltage supply not be infringed.

F

# Dimensional drawings

Protective field heights 150 mm ... 1200 mm



Sender with swivel mount, small housing (receiver mirror image)

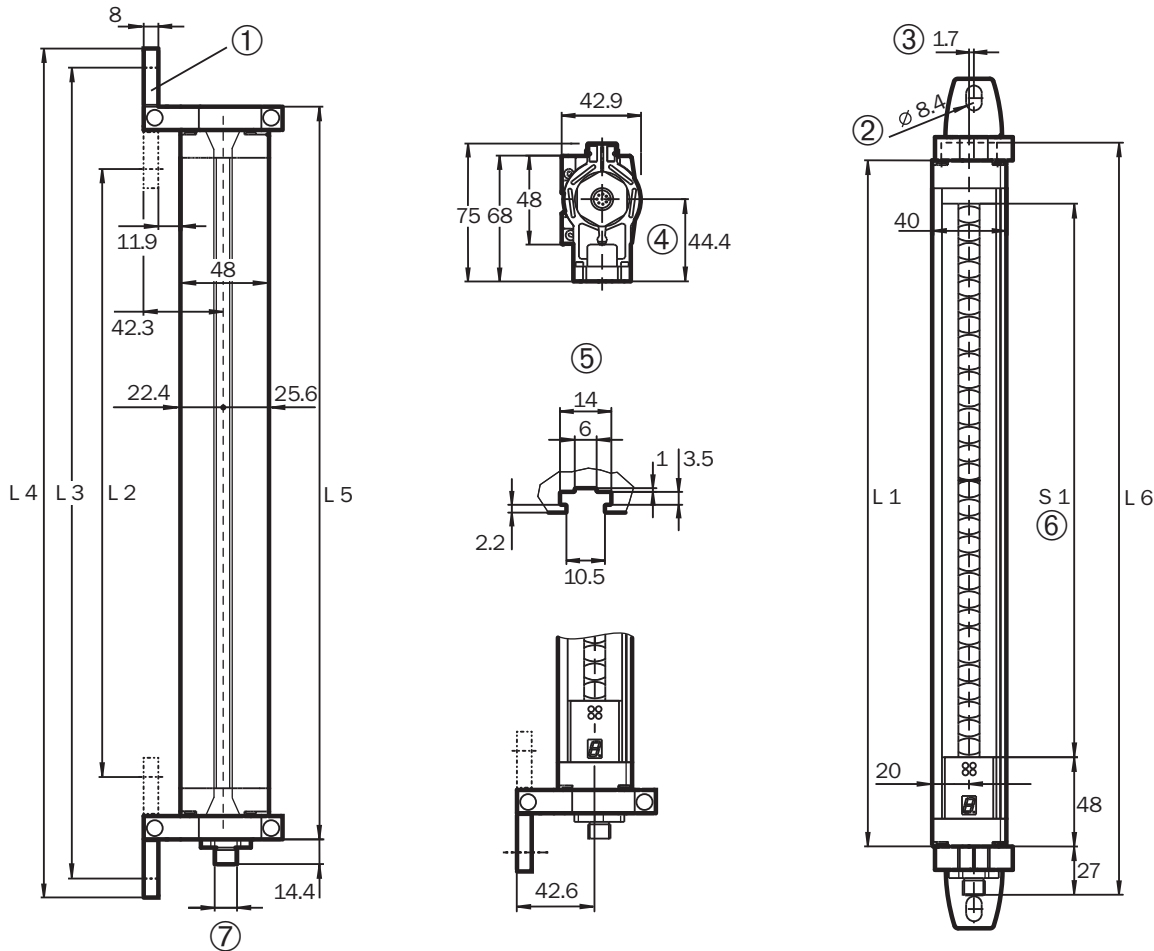
- ① Mounting clamp
- ② Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ③ Center of light beam offset
- ④ Adjustment
- ⑤ Sliding nut groove for side mounting
- ⑥ Protective field height
- ⑦ Plug M12 x 8

S1	L1	L2	L3	L4	L5	L6
150	246	204	313	334	271	276
300	364	322	432	452	390	394
450	515	473	582	603	540	545
600	666	623	733	754	691	696
750	816	774	884	904	841	846
900	967	924	1034	1055	992	997
1050	1117	1075	1185	1205	1142	1147
1200	1266	1224	1334	1345	1292	1298

Dimensions in mm

Protective field heights 1350 mm ... 1800 mm

F



Sender unit with swivel mount, large housing profile (receiver unit mirror image)

- ① Mounting clamp
- ② Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ③ Center of light beam offset
- ④ Adjustment
- ⑤ Sliding nut groove for side mounting
- ⑥ Protective field height
- ⑦ Plug M12 x 8

S1	L1	L2	L3	L4	L5	L6
1350	1426	1384	1494	1514	1452	1463
1500	1577	1535	1644	1665	1602	1614
1650	1727	1685	1795	1815	1752	1764
1800	1878	1836	1945	1966	1903	1915

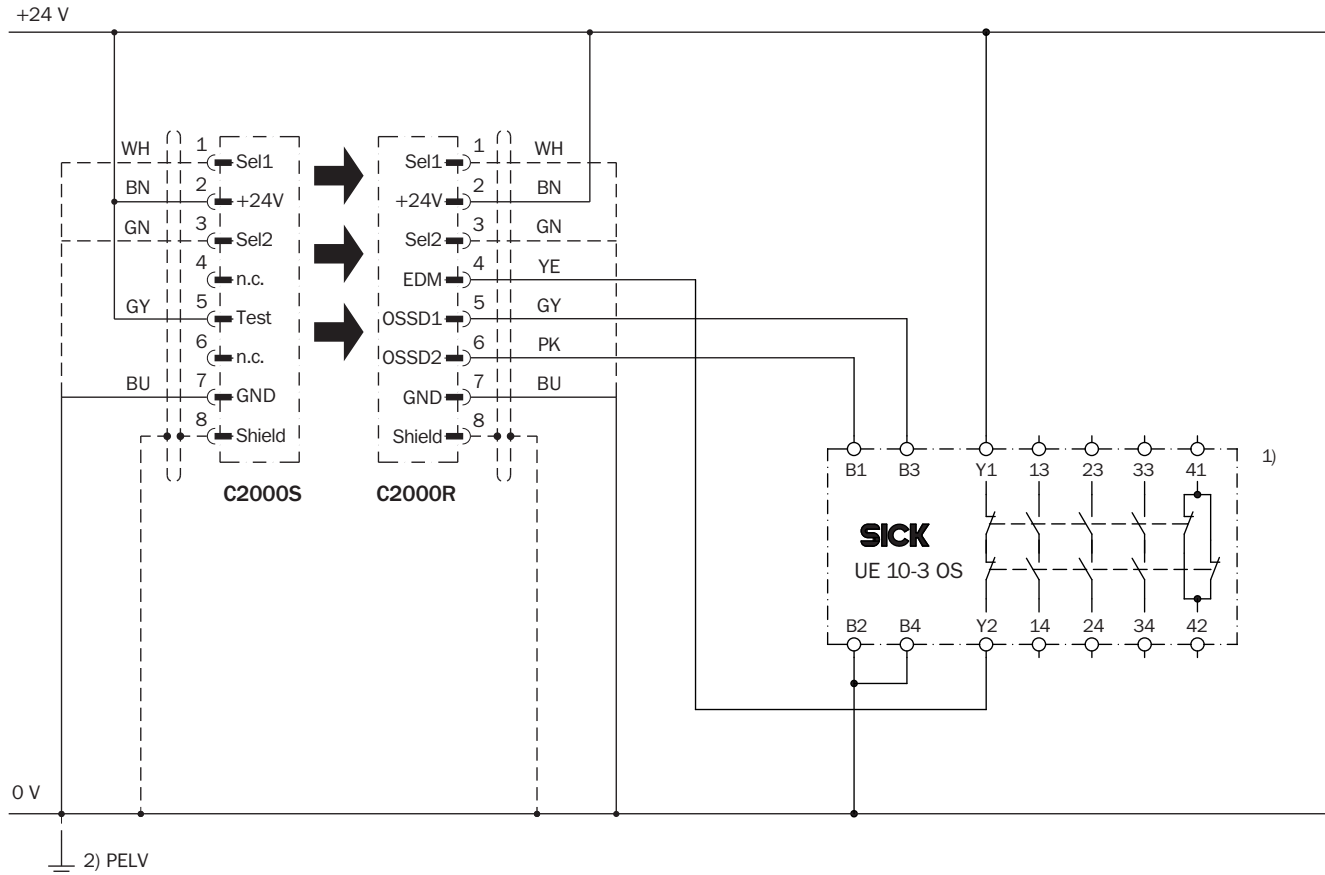
Dimensions in mm



## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### C2000 Standard on UE10-30S safety relay



#### Task

Connection of a C2000 Standard safety light curtain to UE10-30S. Operating mode: without restart interlock and with external device monitoring.

#### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the system is enabled. The OSSD1 and OSSD2 outputs are live, the UE10-30S is switched on. On the interruption of one of the light beams, the UE10-30S is deactivated by the OSSD1 and OSSD2 outputs.

#### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of the UE10-30S will be detected. The shutdown function is retained.

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
- 2) PELV in accordance with the requirements in EN 60204-1 / 6.4 Take note of the operating instructions of the integrated devices.


## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).









## Accessories

### Mounting systems for C2000, protective field heights 150 mm ... 1200 mm (small housing)


Figure	Description	Packing unit	Type	Part no.
	Mounting bracket, rigid	4	BEF-3WNKBAST4	2044068
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 1, swivel mount	4	BEF-2SMKEAKU4	2019649
	Stainless steel bracket, adjustable	4	BEF-2SMKEAES4	2030288
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMKEAAL4	2044848

F



## Mounting systems for C2000, protective field heights 1350 mm ... 1800 mm (large housing)

Figure	Description	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847


## Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
	Socket M12 x 7 + FE	Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves

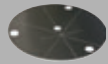




Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

## Mirror columns with protective field height mirror


Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0

## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns, for C4000, C2000 and M2000 in large housing	2	BEF-2SMMEAL2	2045883
	Omega bracket, mounting kit for device columns, for C4000 and C2000 in small housing	2	BEF-2SMKEAL2	2045884
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

**Additional front screens**

Figure	Suitable for protective field height	Part no.
 <p>Example of use</p>	150 mm	2022404
	450 mm	2022406
	600 mm	2022407
	750 mm	2022408
	900 mm	2022409
	1050 mm	2022410
	1200 mm	2022411

**Additional heavy-duty front screens**

Figure	Suitable for protective field height	Part no.
 <p>Example of use</p>	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863

F




**PNS75 deflector mirrors**

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
1800 mm		PNS75-184	1019424	


## PNS125 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435



## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column				4056731
	Adapter for AR60, for small housing profile	-	-	-	4032462
	Adapter for AR60, for small housing profile in PU3Hxx-xxxxxxx device column				4056730

## Configuration tools

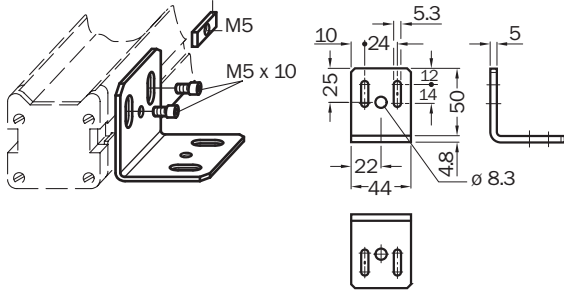
Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

## Device protection

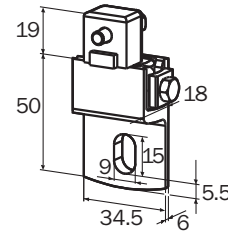
Figure	Description	Type	Part no.
	20 mm diameter	Test rod	2022600
	30 mm diameter	Test rod	2022602
	40 mm diameter	Test rod	2022604
	Test rod holder	BEF-3WNAAAAL1	2052249

Dimensional drawings mounting systems

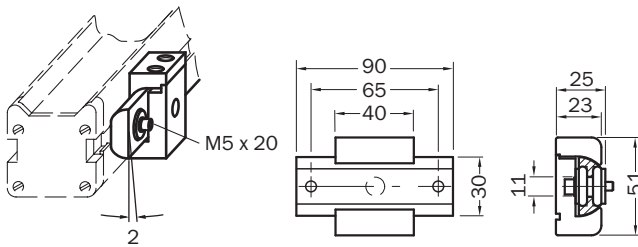
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



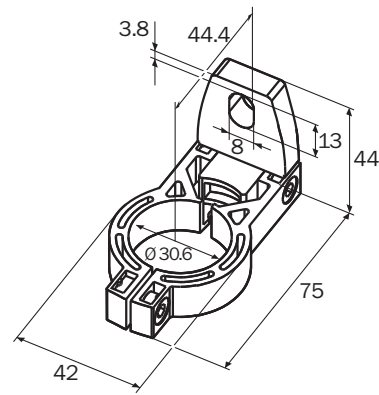
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



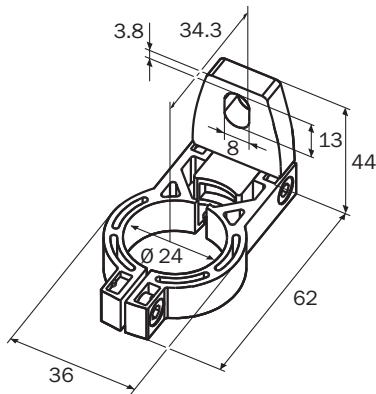
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



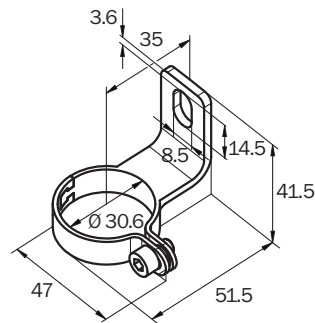
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



**BEF-2SMKEAKU4**  
Mounting kit 1, swivel mount

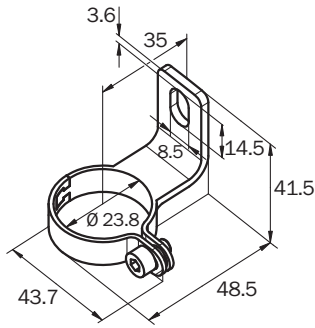


**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable

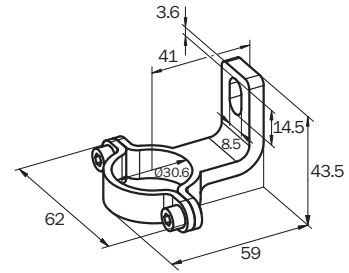


Dimensions in mm

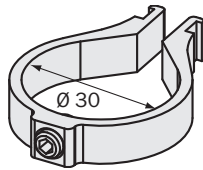
**BEF-2SMKEAES4**  
Stainless steel bracket, adjustable



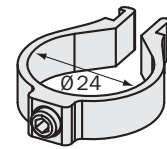
**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2SMMEAAL4**  
Omega bracket, flexible and quick installation with only one screw



**BEF-2SMKEAAL4**  
Omega bracket, flexible and quick installation with only one screw

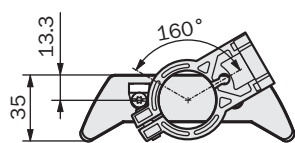


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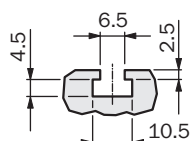
Dimensions in mm



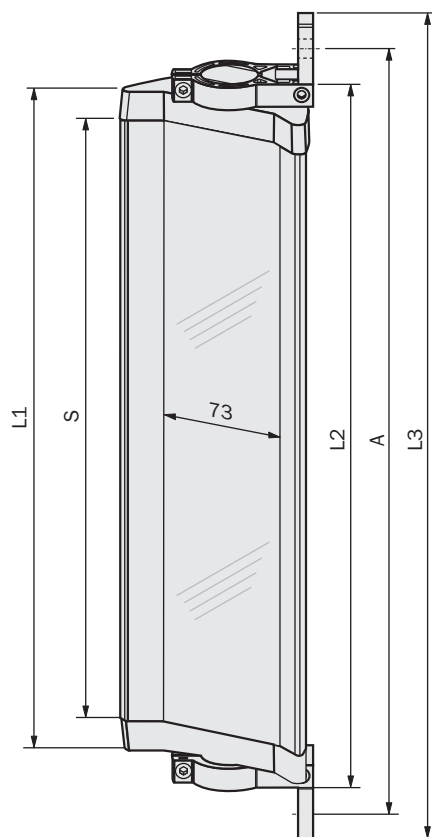
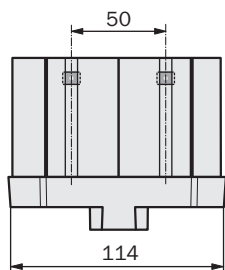
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

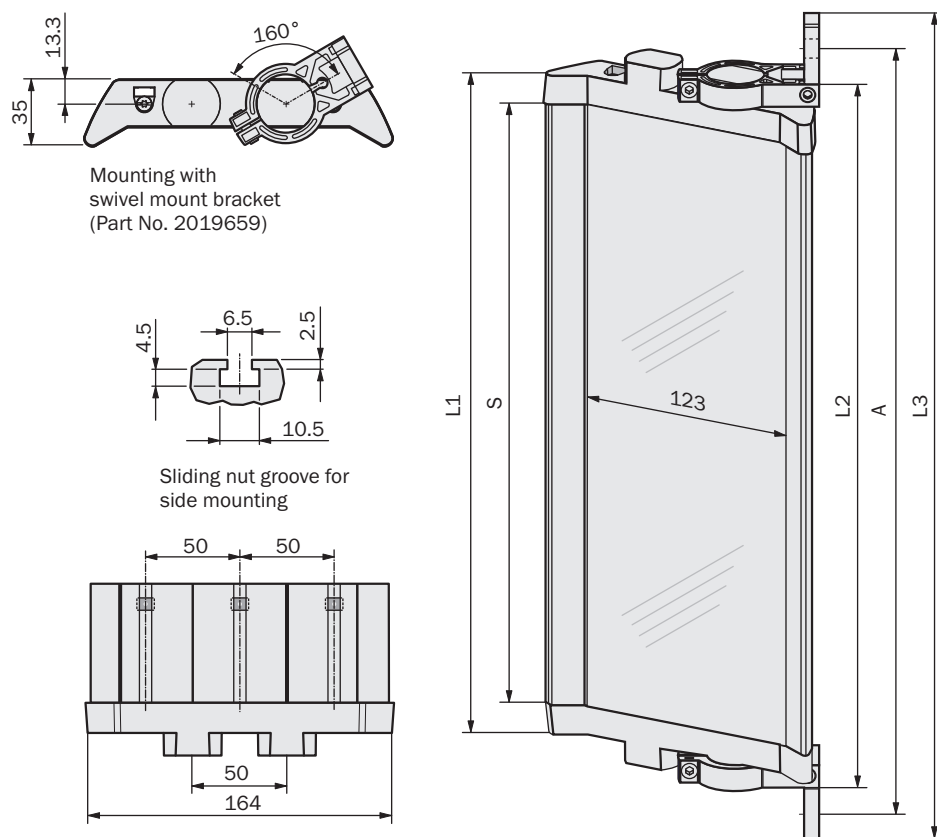


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



F

Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

## Technical data overview

Resistant materials	Stainless steel V4A, PMMA, PA 6
Enclosure rating	IP 69K, IP 67, IP 66, IP 65
Protective field height (depending on type)	150 mm ... 1200 mm
Scanning range (depending on type)	0 m ... 4.5 m / 2.5 m ... 14.5 m
Resolution	30 mm
Type	Type 2 (IEC 61496)

## Product description

The IP69K housing in conjunction with the C2000 safety light curtain achieves the enclosure rating IP 69K. A high level of resistance against the usual cleaning agents is achieved by using suitable mate-

rials (V4A, PMMA, PA, PVC). A compensating element (membrane) prevents the plastic tubes from misting up and the entry of liquids. The cable is fed into the device through the proven PG connector.

## In-system added value

Combined with SICK safe control solutions

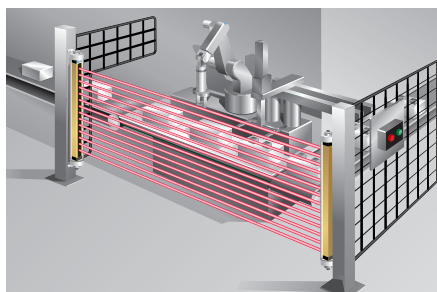
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

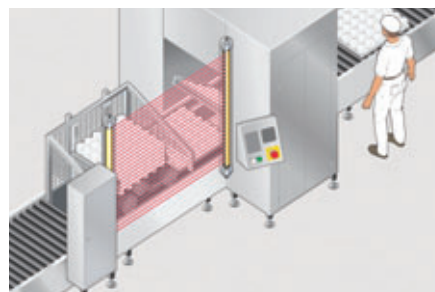
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Packaging industry
- Pharmaceutical industry
- Food industry
- Clean room systems
- Chemical industry



Hazardous point protection on a machining center in the hygiene area



Hazardous point protection on a cheese-making machine



- Enclosure ratings IP 69K, IP 67 and IP 66
- Resistant to wash down pressures up to 100 bar and wash down temperatures up to 80 °C
- ECOLAB and Diversy cleaning certificates
- Compact design in 50 mm acrylic tube with high hygiene and cleaning standards
- Chemical-resistant materials: stainless steel end caps, PMMA tube, PA membrane
- IP 69K-rated PVC cable and screw fitting
- Stainless steel brackets



Further information	Page
→ Ordering information	F-254
→ Technical specifications	F-255
→ Dimensional drawings	F-256
→ Connection diagrams	F-257
→ Accessories	F-258
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

IP69K Housing with integrated C2000 Standard sender or receiver unit,  
including IP 69K-rated PVC cable

- Resolution: 30 mm
- Scanning range: 0 m ... 4.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C25S-015103C11	1024184	C25E-015303C11	1024185
300 mm	C25S-030103C11	1024187	C25E-030303C11	1024188
450 mm	C25S-045103C11	1024190	C25E-045303C11	1024191
600 mm	C25S-060103C11	1024193	C25E-060303C11	1024194
750 mm	C25S-075103C11	1024196	C25E-075303C11	1024197
900 mm	C25S-090103C11	1024199	C25E-090303C11	1024200
1050 mm	C25S-105103C11	1024202	C25E-105303C11	1024203
1200 mm	C25S-120103C11	1024205	C25E-120303C11	1024206

- Resolution: 30 mm
- Scanning range: 2.5 m ... 14.5 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C25S-015203C11	1024186	C25E-015303C11	1024185
300 mm	C25S-030203C11	1024189	C25E-030303C11	1024188
450 mm	C25S-045203C11	1024192	C25E-045303C11	1024191
600 mm	C25S-060203C11	1024195	C25E-060303C11	1024194
750 mm	C25S-075203C11	1024198	C25E-075303C11	1024197
900 mm	C25S-090203C11	1024201	C25E-090303C11	1024200
1050 mm	C25S-105203C11	1024204	C25E-105303C11	1024203
1200 mm	C25S-120203C11	1024207	C25E-120303C11	1024206

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution	30 mm	
Scanning range (depending on type)	0 m ... 4.5 m / 2.5 m ... 14.5 m	-
Protective field height (depending on type)	150 mm ... 1200 mm	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	2.2 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 19 ms
Synchronization	Optical, without separate synchronization	
Protection class	III	
Enclosure rating	IP 69K, IP 67, IP 66, IP 65	
Materials		
End caps	Stainless steel V4A	
Plastic tube	PMMA	
Compensating element (membrane)	PA 6	
PG connector	PA 6	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing diameter	52 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	
Shock resistance	10 g, 16 ms (IEC 68-2-29)	

<sup>1)</sup> Between two demands on a safety-related response of the device at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics.  
For more detailed information on this topic, see page A-10.

### Functional data

System part	Sender	Receiver
External device monitoring	-	✓
Beam coding	✓	
Configuration method	Hard wired	

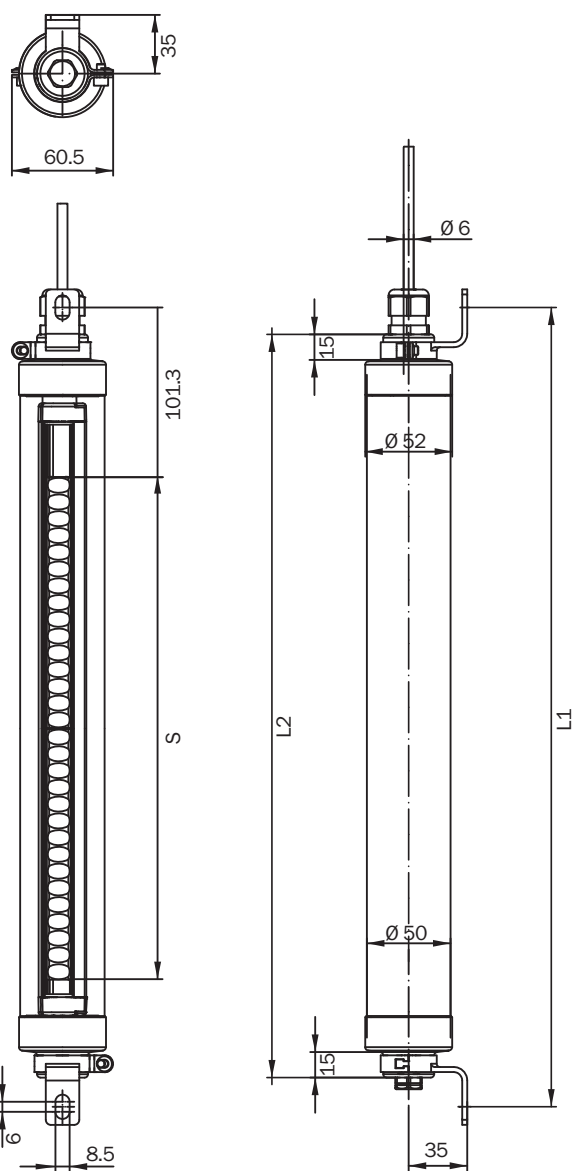
Electrical data

System part	Sender	Receiver
System connection	PVC cable, 15 m	
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>1)</sup>	
Residual ripple	≤ 5 %	
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	Min. $V_S$ - 2.25 V DC
Switching current	-	Max. 500 mA

<sup>1)</sup> Upper and lower limit values of voltage supply not be infringed

Dimensional drawings

F



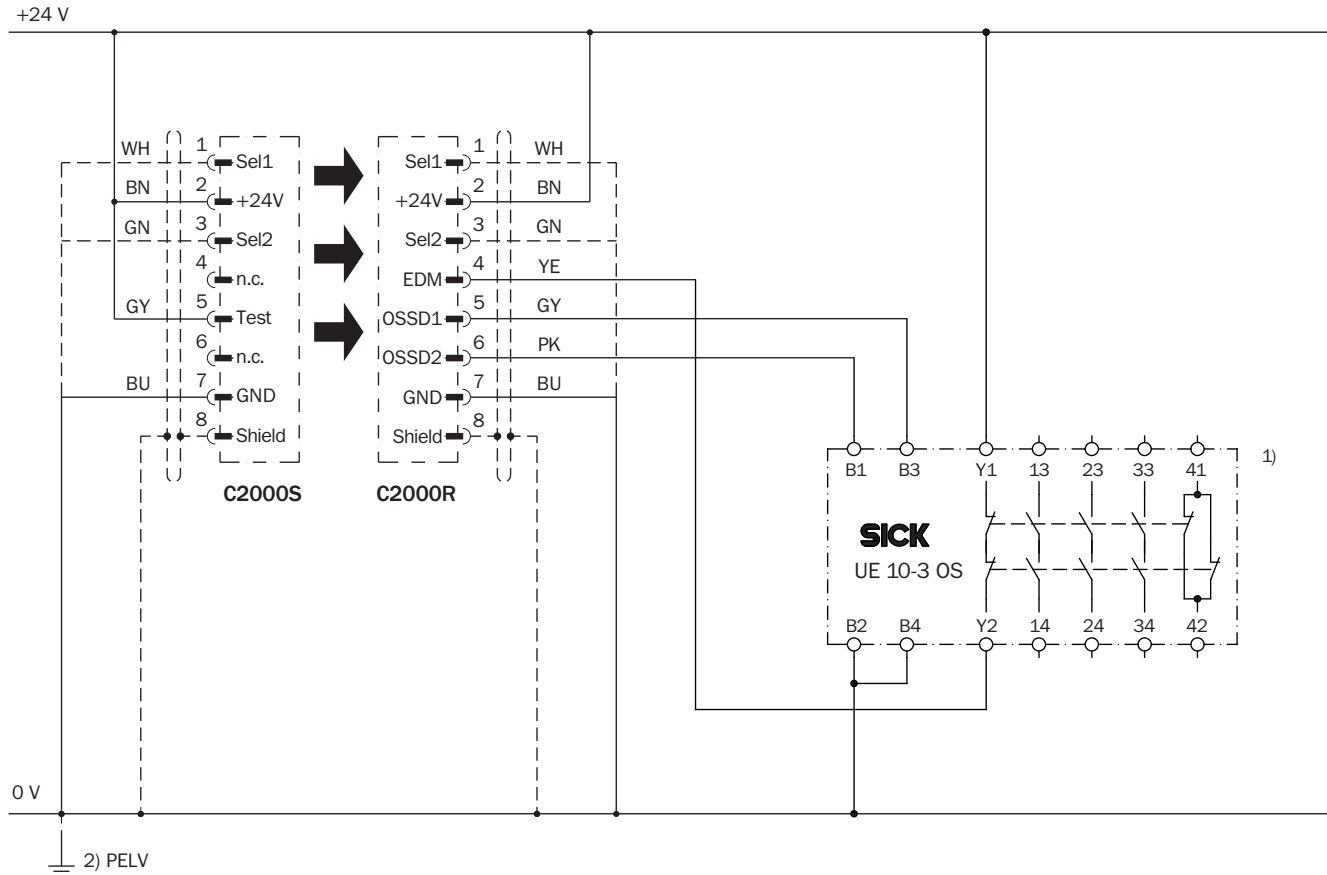
Protective field heght S	L1	L2
150	357	324
300	476	443
450	626	593
600	777	744
750	927	894
900	1078	1045
1050	1228	1195
1200	1382	1349

Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### C2000 Standard on UE10-30S safety relay



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#### Task

Connection of a C2000 Standard safety light curtain to UE10-30S. Operating mode: without restart interlock and with external device monitoring.

#### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the system is enabled. The OSSD1 and OSSD2 outputs are live, the UE10-30S is switched on. On interruption of one of the light beams, the UE10-30S is deactivated by the OSSD1 and OSSD2 outputs.

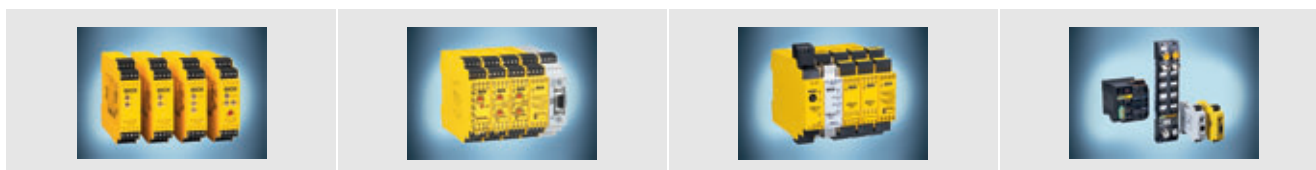
#### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of the UE10-30S will be detected. The shutdown function is retained.

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
- 2) PELV in accordance with the requirements in EN 60204-1 / 6.4 Take note of the operating instructions of the integrated devices.

## sens:Control – safe control solutions



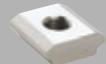
Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Description	Packing unit	Type	Part no.
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Stainless steel support bracket	2	BEF-2AAADES2	2026849
	Venting membrane	-	Venting membrane	5309082
	For M12 cable socket	-	Assembly key	4034690

### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789


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**Deflector mirror**

Figure	Mirror material	Suitable for protective field height	Type	Part no.
	Stainless steel	750 mm	PNS75-079S05	1046075

**Configuration tools**

Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

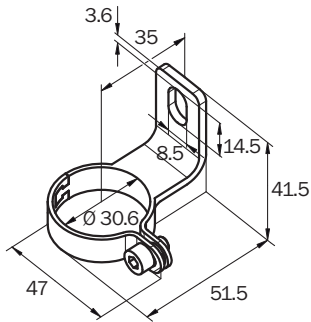
**Device protection**

Figure	Description	Type	Part no.
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

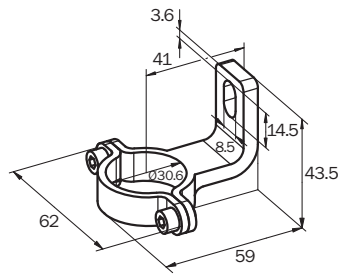
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Dimensional drawings mounting systems

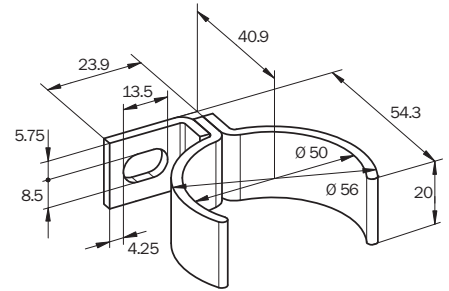
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



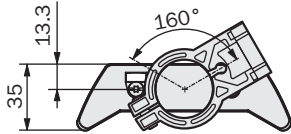
**BEF-2AAADES2**  
Stainless steel support bracket



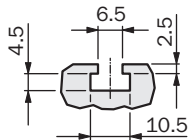
Dimensions in mm

Dimensional drawings PNS75 deflector mirror

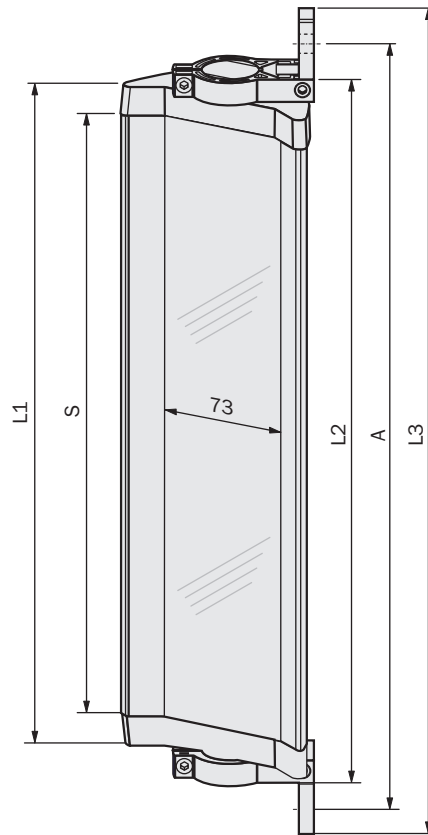
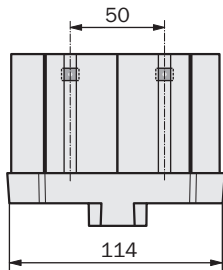
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Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting



Mirror height S	L1	L2	L3	A
790	822	846	910	890

Dimensions in mm

## Technical data overview

Protective field height (depending on type)	150 mm ... 1200 mm
Scanning range	0 m ... 6 m
Resolution	30 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)
Enclosure rating	IP 54

## Product description

With its high signal reserve, the C2000 Eco safety light curtain is also reliable under harsh industrial conditions.

The C2000 Eco is designed for guard only function, but no additional functionality. The LED status indicator shows the status of the OSSDs and the supply voltage.

The light curtain is mounted with a low-cost side bracket. The 5-pole cable is another option to optimize expenses.

Safe control solutions and service concepts complete the product range to provide an ideal solution.

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52

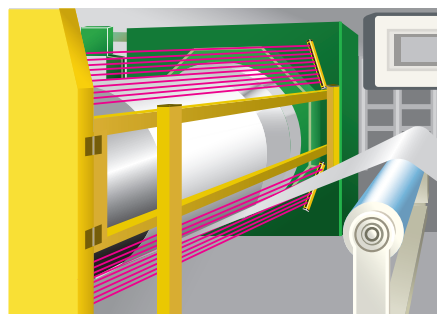
→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

■ Wood industry

■ Textile industry



Textile industry: C2000 on a warping machine



- Self-test
- LED status display
- Mounting with side bracket



F

Further information	Page
→ Ordering information	F-262
→ Technical specifications	F-263
→ Dimensional drawings	F-264
→ Connection diagrams	F-265
→ Accessories	F-266
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

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### C2000 Eco

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Usage	As a standalone system
Connection types	System connection: Plug M12 x 5

- Resolution: 30 mm
- Scanning range: 0 m ... 6 m

Protective field height	Sender		Receiver	
	Type	Part no.	Type	Part no.
150 mm	C20S-015103D41	1041577	C20E-015303D41	1041578
300 mm	C20S-030103D41	1041579	C20E-030303D41	1041580
450 mm	C20S-045103D41	1041581	C20E-045303D41	1041582
600 mm	C20S-060103D41	1041583	C20E-060303D41	1041584
750 mm	C20S-075103D41	1041585	C20E-075303D41	1041586
900 mm	C20S-090103D41	1041587	C20E-090303D41	1041588
1050 mm	C20S-105103D41	1041589	C20E-105303D41	1041590
1200 mm	C20S-120103D41	1041591	C20E-120303D41	1041592

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution	30 mm	
Scanning range	0 m ... 6 m	-
Protective field height (depending on type)	150 mm ... 1200 mm	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	$2.2 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 19 ms
Synchronization	Optical, without separate synchronization	
Protection class	III	
Enclosure rating	IP 54 (EN 60529)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	34 mm x 29 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	
Shock resistance	10 g, 16 ms (IEC 68-2-29)	

<sup>1)</sup> Between two demands on a safety-related response of the device at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics.  
For more detailed information on this topic, see page A-10.

### Electrical data

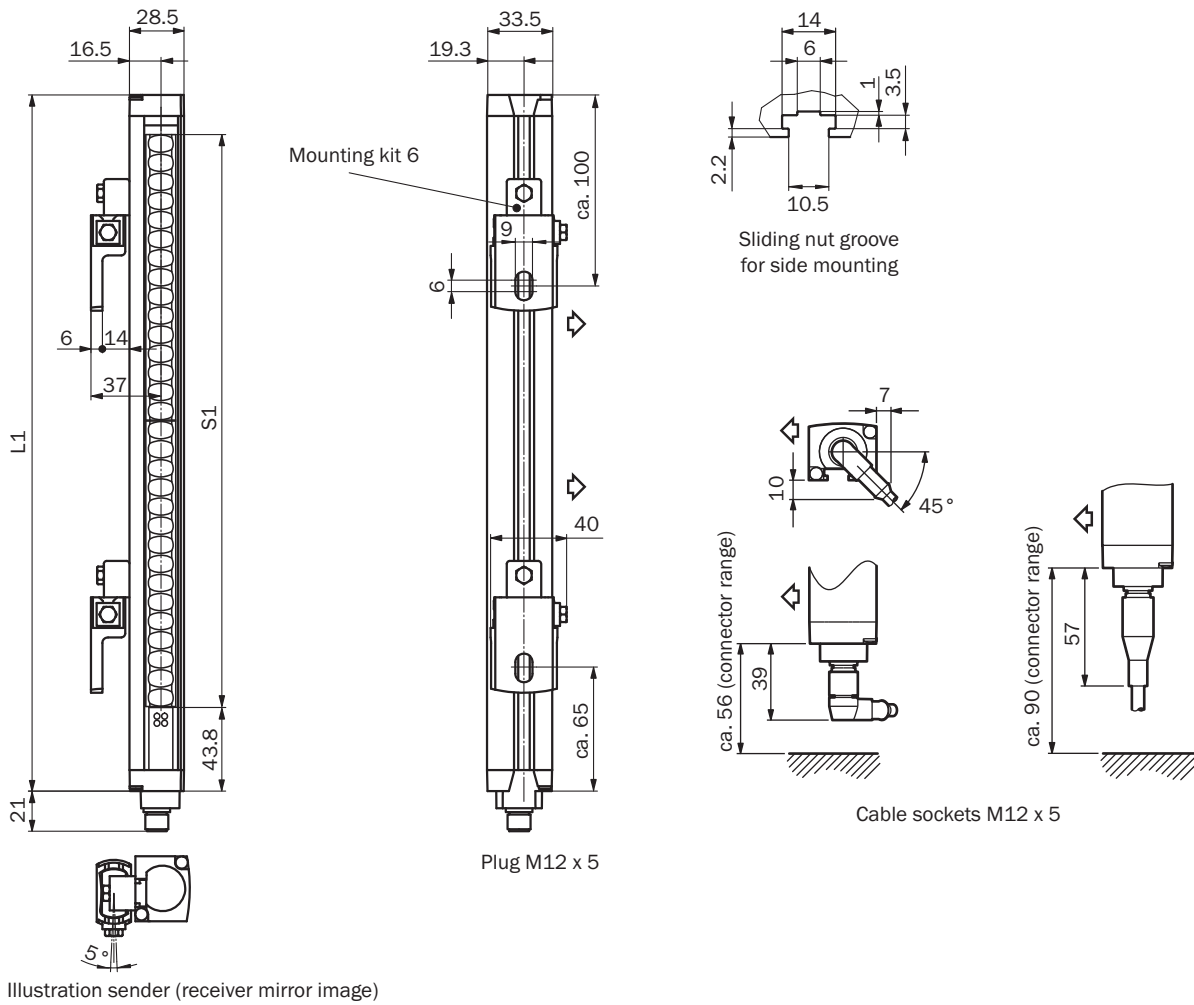
System part	Sender	Receiver
System connection	Plug M12 x 5	
Connecting cable length	Max. 15 m <sup>1)</sup>	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 5 %	
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	Min. $V_S - 2.25$ V DC
Switching current	-	Max. 250 mA
Display elements	LED	

<sup>1)</sup> The length of the connecting cable is limited, because wire resistance is max. 4 Ohm

<sup>2)</sup> Upper and lower limit values of voltage supply not be infringed

# Dimensional drawings

## C2000 Eco



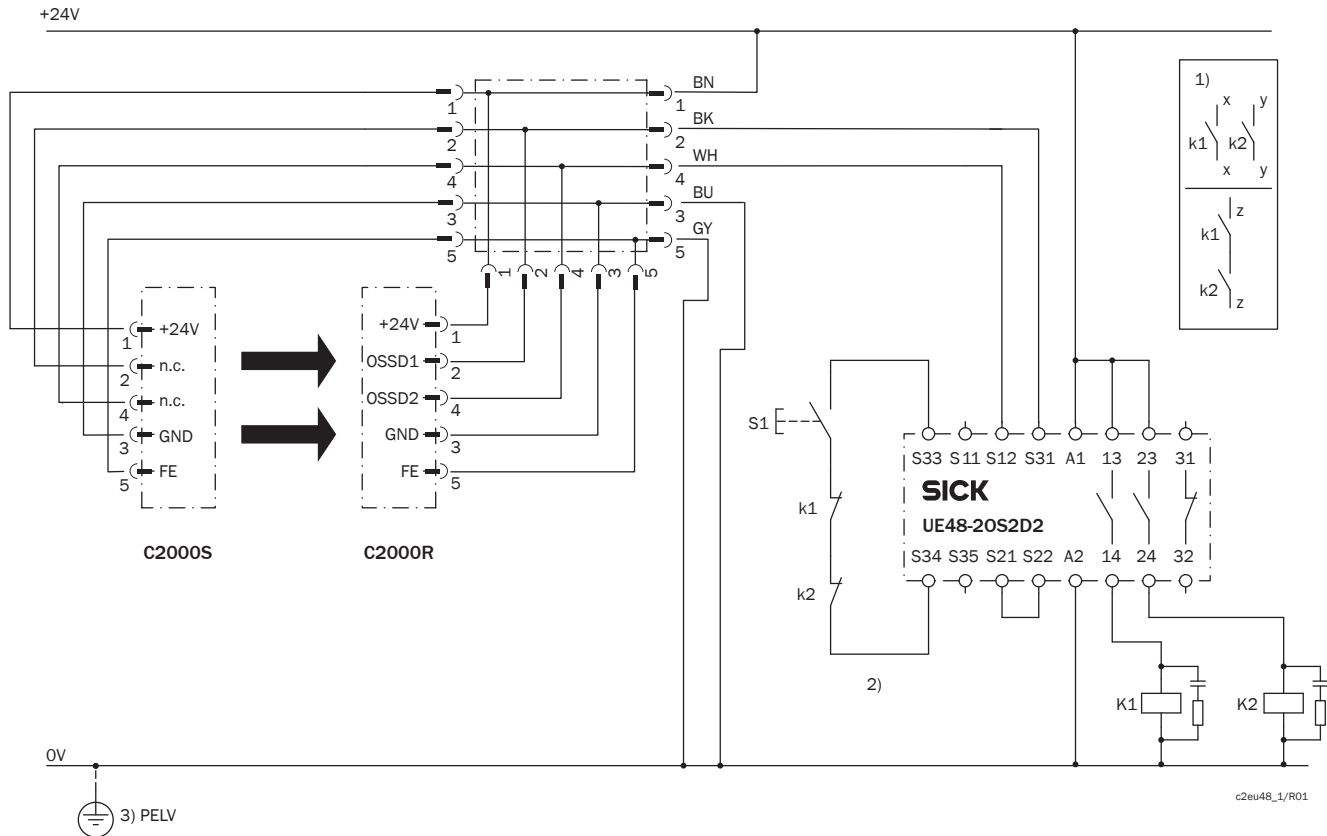
S1	L1
150	246
300	364
450	515
600	666
750	816
900	967
1050	1117
1200	1266

Dimensions in mm

# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## C2000 Eco with T-piece on UE48-20S safety relay



**Task**

Connection of a C2000 Eco safety light curtain with a T-piece to a UE48-20S safety relay. Operating mode: with restart interlock and external device monitoring.

**Operating characteristics**

When the light path is clear, the OSSD1 and OSSD2 outputs are live. When K1 and K2 are de-energized and functioning correctly, the system is ready for switch-on and waits for an input signal/switch-on signal. The UE48-20S is switched on by pressing and releasing the S1 button. The outputs (contacts 13 - 14 and 23 - 24) energize the K1 and K2 contactors. On interruption of one or several of the light beams in the active protective field, the OSSD1 and OSSD2 outputs shutdown the UE48-20S. The contactors K1 and K2 are de-energized.

**Fault analysis**

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of one of

the contactors K1 or K2 will be detected. The shutdown function is retained. On manipulation (e.g., jamming) of the S1 button, the UE48-20S will not re-enable the output current circuits.

**Comments**

1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) The external device monitoring is only static.

3) PELV in accordance with the requirements in EN 60204-1 / 6.4

Take note of the operating instructions of the integrated devices.

This circuit can also be used for the UE48-30S.



## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting bracket, rigid	4	BEF-3WNKBAST4	2044068
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600

### Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 5, stripped	Straight	2 m	DOL-1205-G02M	6008899
			5 m	DOL-1205-G05M	6009868
			10 m	DOL-1205-G10M	6010544
			15 m	DOL-1205-G15M	6029215

### Extension connection cables for the connection to T-connector


Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Plug M12 x 5, socket M12 x 5	Plug straight/ socket straight	0.6 m	DSL-1205-G0M6C	6025930
			1 m	DSL-1205-G01MC	6029280
			1.5 m	DSL-1205-G1M5C	6029281
			2 m	DSL-1205-G02MC	6025931
			5 m	DSL-1205-G05MC	6029282
		Plug straight/ socket angled	0.6 m	DSL-1205-B0M6C	6029283
			1 m	DSL-1205-B01MC	6029284
			1.5 m	DSL-1205-B1M5C	6029286
			2 m	DSL-1205-B02MC	6029287
			5 m	DSL-1205-B05MC	6029288




**T-junction**

Remark	Connection type	Type	Part no.
T-connector plugs directly into receiver, splits the single home run from control cabinet between sender and receiver	Plug M12 x 5	DSC-1205T000025KM0	6030664

**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

**Device columns with external grooves**

Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646




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**Mirror columns with protective field height mirror**


Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0

**Column parts and accessories**

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Additional front screens

Figure	Suitable for protective field height	Part no.
 Example of use	150 mm	2022404
	300 mm	2022405
	450 mm	2022406
	600 mm	2022407
	750 mm	2022408
	900 mm	2022409
	1050 mm	2022410
	1200 mm	2022411



## PNS75 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
		1800 mm	PNS75-184	1019424


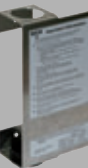
## PNS125 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435

**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for small housing profile	-	-	-	4032462
	Adapter for AR60, for small housing profile in PU3Hx-xxxxxxx device column	-	-	-	4056730

**Device protection**

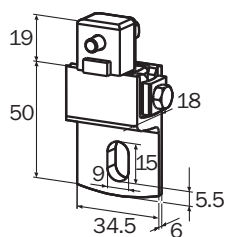
Figure	Description	Type	Part no.
	30 mm diameter	Test rod	2022602
	Test rod holder	BEF-3WNAAAAL1	2052249

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**Dimensional drawings mounting systems**

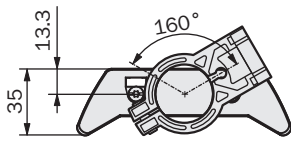
**BEF-1SHABAZN4**

**Mounting kit 6, swivel function, side bracket**

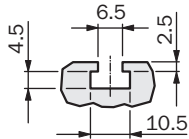


Dimensions in mm

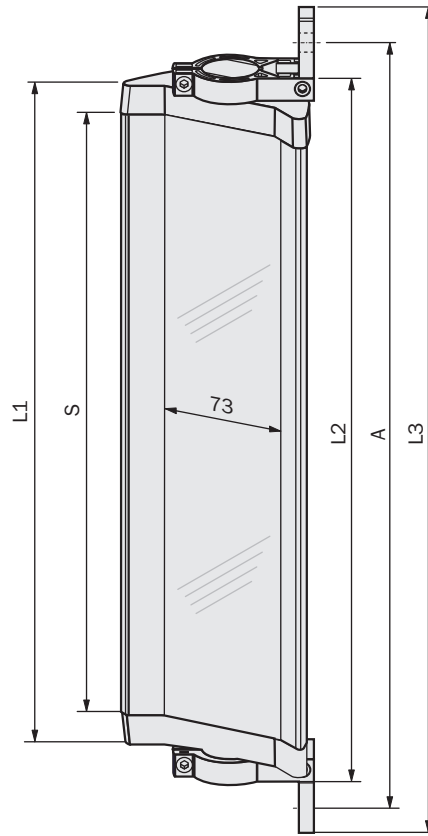
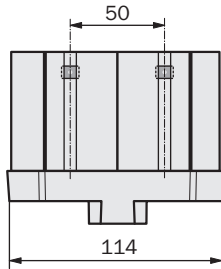
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

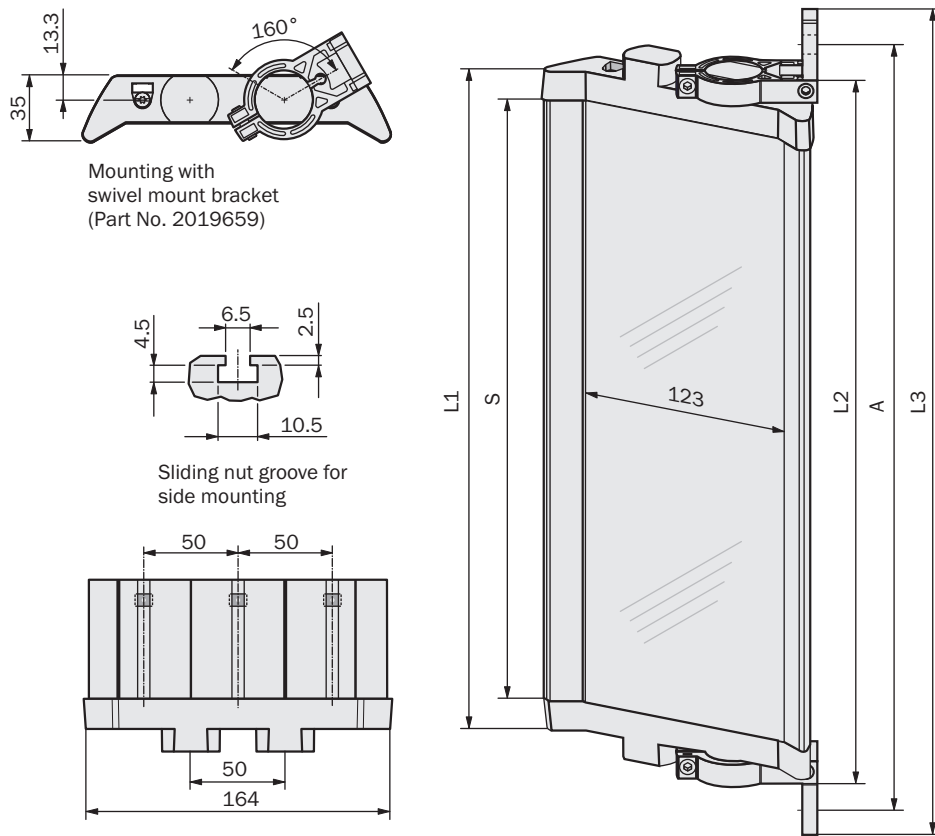


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm



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- Restart interlock (RES)
- External device monitoring (EDM)
- Self-test
- 7-segment display
- Diagnostics
- Alignment aid
- Beam coding



## Technical data overview

Protective field height (depending on type)	300 mm ... 1200 mm
Scanning range (depending on type)	0 m ... 6 m / 2.5 m ... 19 m
Resolution (depending on type)	20 mm / 30 mm / 40 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)
Enclosure rating	IP 65 EN 60529

## Product description

With its high signal reserve, the C2000 RES/EDM safety light curtain is also reliable under harsh industrial conditions. Functions and status information integrated in the device allow rapid commissioning and prevent unnecessary machine downtime. The modular design provides

maximum machine safety while taking into account economic considerations by precisely coordinating the characteristics of the device to the requirements.

Safe control solutions and service concepts complete the product range to provide an ideal solution.

## In-system added value

Combined with SICK safe control solutions

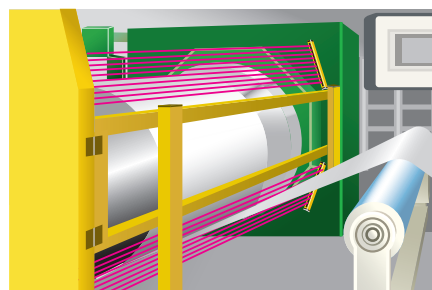
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	O-2
Flexi Soft	✓	✓	✓	O-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

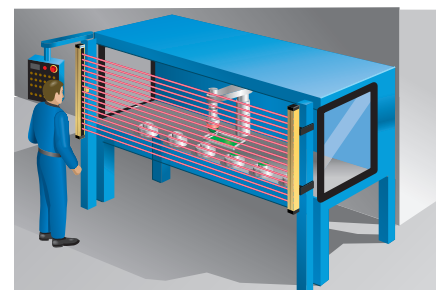
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Storage and conveyor technology
- Wood industry
- Textile industry
- Stone production
- Electronics industry
- Packaging industry



Textile industry: C2000 RES/EDM on a warping machine



Printing industry: C2000 RES/EDM on a pad printing machine

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→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C2000 RES/EDM

Usage	As a standalone system
Connection types	System connection: plug M12 x 8

■ Scanning range: 0 m ... 6 m

Resolution	Protective field height	Sender		Receiver	
		Type	Part no.	Type	Part no.
20 mm	300 mm	C20S-030102A11	1016448	C20E-030302A31	1042138
	450 mm	C20S-045102A11	1016573	C20E-045302A31	1042139
	600 mm	C20S-060102A11	1016574	C20E-060302A31	1042140
	750 mm	C20S-075102A11	1016579	C20E-075302A31	1042141
	900 mm	C20S-090102A11	1016584	C20E-090302A31	1042142
	1050 mm	C20S-105102A11	1016589	C20E-105302A31	1042143
	1200 mm	C20S-120102A11	1016464	C20E-120302A31	1042144
30 mm	300 mm	C20S-030103A11	1016568	C20E-030303A31	1041570
	450 mm	C20S-045103A11	1016454	C20E-045303A31	1041571
	600 mm	C20S-060103A11	1016477	C20E-060303A31	1041572
	750 mm	C20S-075103A11	1016479	C20E-075303A31	1041573
	900 mm	C20S-090103A11	1016481	C20E-090303A31	1041574
	1050 mm	C20S-105103A11	1016483	C20E-105303A31	1041575
	1200 mm	C20S-120103A11	1016594	C20E-120303A31	1041576
40 mm	300 mm	C20S-030104A11	1016570	C20E-030304A31	1042145
	450 mm	C20S-045104A11	1016456	C20E-045304A31	1042146
	600 mm	C20S-060104A11	1016576	C20E-060304A31	1042147
	750 mm	C20S-075104A11	1016581	C20E-075304A31	1042148
	900 mm	C20S-090104A11	1016586	C20E-090304A31	1042149
	1050 mm	C20S-105104A11	1016591	C20E-105304A31	1042150
	1200 mm	C20S-120104A11	1016596	C20E-120304A31	1042151

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■ Scanning range: 2.5 m ... 19 m

Resolution	Protective field height	Sender		Receiver	
		Type	Part no.	Type	Part no.
20 mm	300 mm	C20S-030202A11	1016632	C20E-030302A31	1042138
	450 mm	C20S-045202A11	1016458	C20E-045302A31	1042139
	600 mm	C20S-060202A11	1016633	C20E-060302A31	1042140
	750 mm	C20S-075202A11	1016634	C20E-075302A31	1042141
	900 mm	C20S-090202A11	1016635	C20E-090302A31	1042142
	1050 mm	C20S-105202A11	1016636	C20E-105302A31	1042143
	1200 mm	C20S-120202A11	1016466	C20E-120302A31	1042144
30 mm	300 mm	C20S-030203A11	1016572	C20E-030303A31	1041570
	450 mm	C20S-045203A11	1016460	C20E-045303A31	1041571
	600 mm	C20S-060203A11	1016578	C20E-060303A31	1041572
	750 mm	C20S-075203A11	1016583	C20E-075303A31	1041573
	900 mm	C20S-090203A11	1016588	C20E-090303A31	1041574
	1050 mm	C20S-105203A11	1016593	C20E-105303A31	1041575
	1200 mm	C20S-120203A11	1016599	C20E-120303A31	1041576
40 mm	300 mm	C20S-030204A11	1016638	C20E-030304A31	1042145
	450 mm	C20S-045204A11	1016462	C20E-045304A31	1042146
	600 mm	C20S-060204A11	1016639	C20E-060304A31	1042147
	750 mm	C20S-075204A11	1016640	C20E-075304A31	1042148
	900 mm	C20S-090204A11	1016641	C20E-090304A31	1042149
	1050 mm	C20S-105204A11	1016642	C20E-105304A31	1042150
	1200 mm	C20S-120204A11	1016643	C20E-120304A31	1042151

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	20 mm / 30 mm / 40 mm	
Scanning range (depending on type)	0 m ... 6 m / 2.5 m ... 19 m	-
Protective field height (depending on type)	300 mm ... 1200 mm	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	2.2 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 34 ms
Synchronization	Optical, without separate synchronization	
Protection class	III	
Enclosure rating	IP 65 (EN 60529)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section	34 mm x 29 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	
Shock resistance	10 g, 16 ms (IEC 68-2-29)	

<sup>1)</sup> Between two demands on a safety-related response of the device at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics.  
For more detailed information on this topic see page A-10

### Functional data

System part	Sender	Receiver
Restart interlock	-	✓
External device monitoring	-	✓
Beam coding	✓	
Configuration method	Hard wired	

## Electrical data

System part	Sender	Receiver
System connection	Plug M12 x 8	
Connecting cable length	Max. 15 m <sup>1)</sup>	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage V <sub>S</sub>	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 5 %	
Safety outputs (OSSD)		
	Type of output	–
	Switching voltage HIGH	–
	Switching current	–
		2 PNP semiconductors, short-circuit protected, cross-circuit monitored
		Min. V <sub>S</sub> – 2.25 V DC
		Max. 500 mA
Display elements	LED/7-segment	

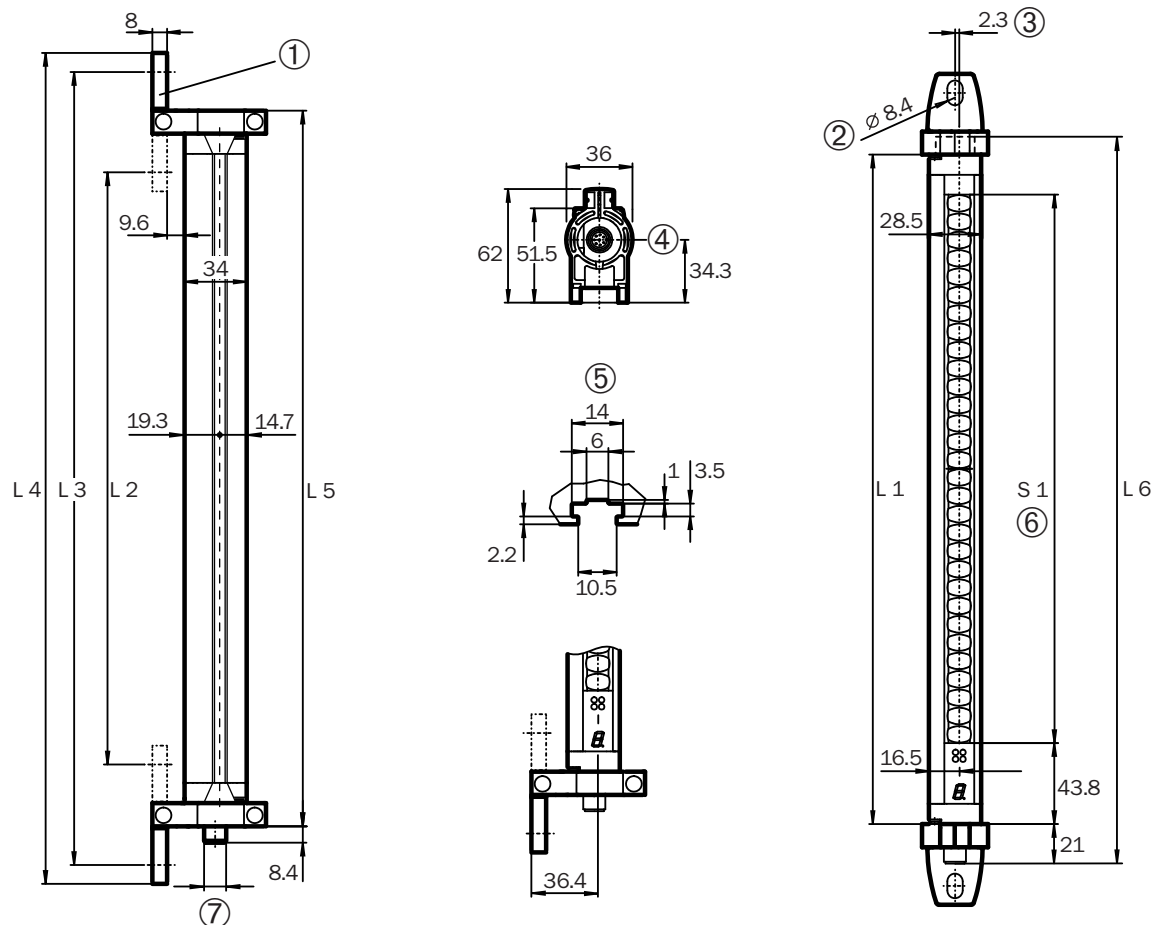
<sup>1)</sup> The length of the connecting cable is limited, because wire resistance is max. 4 Ohm

<sup>2)</sup> Upper and lower limit values of voltage supply not be infringed

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# Dimensional drawings

## C2000 RES/EDM



Sender with swivel mount (receiver mirror image)

- ① Mounting clamp
- ② Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ③ Center of light beam offset
- ④ Adjustment
- ⑤ Sliding nut groove for side mounting
- ⑥ Protective field height
- ⑦ Plug M12 x 8

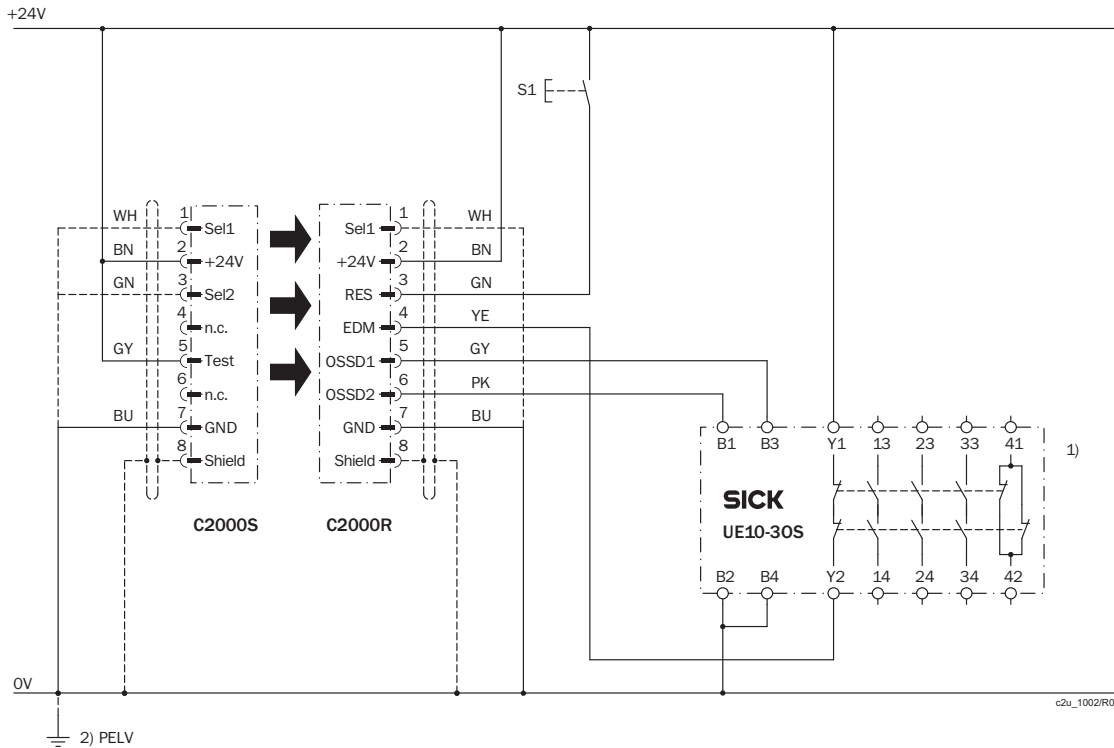
S1	L1	L2	L3	L4	L5	L6
150	246	204	313	334	271	276
300	364	322	432	452	390	394
450	515	473	582	603	540	545
600	666	623	733	754	691	696
750	816	774	884	904	841	846
900	967	924	1034	1055	992	997
1050	1117	1075	1185	1205	1142	1147
1200	1266	1224	1334	1345	1292	1298

Dimensions in mm

# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## C2000 RES/EDM on UE10-30S safety relay



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### Task

Integration of a C2000 RES/EDM safety light curtain on UE10-30S. Operating mode: with restart interlock and external device monitoring.

### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the yellow LED on the receiver flashes. The system is ready to be switched on. The system is enabled by pressing S1 (button is pressed and released). The OSSD1 and OSSD2 outputs are live, the UE10-30S is switched on. On interruption of one of the light beams, the UE10-30S is deactivated by the OSSD1 and OSSD2 outputs.

### Fault analysis

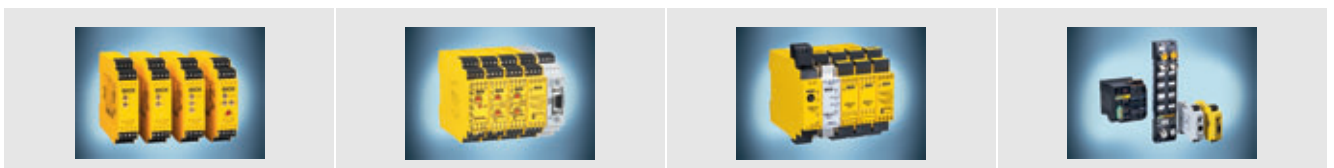
OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The incorrect functioning of the

UE10-30S will be detected and will not result in the loss of the shutdown function. On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits.

### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel insertion in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
- 2) PELV in accordance with the requirements in EN 60204-1 / 6.4 Take note of the operating instructions of the integrated devices.


## sens:Control – safe control solutions



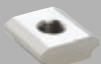
Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting bracket, rigid	4	BEF-3WNKBAST4	2044068
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 1, swivel mount	4	BEF-2SMKEAKU4	2019649
	Stainless steel bracket, adjustable	4	BEF-2SMKEAES4	2030288
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMKEAAL4	2044848


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


### Connecting cable

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
	M12 x 7 + FE	Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343

### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves





Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

## Mirror columns with protective field height mirror


Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0


## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMKEAAL2	2045884
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938


## Additional front screens

Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2022405
	450 mm	2022406
	600 mm	2022407
	750 mm	2022408
	900 mm	2022409
	1050 mm	2022410
	1200 mm	2022411



## PNS75 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
			1800 mm	PNS75-184


## PNS125 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.		
	Glass	300 mm	PNS125-034	1019425		
		450 mm	PNS125-049	1019426		
		600 mm	PNS125-064	1019427		
		750 mm	PNS125-079	1019428		
		900 mm	PNS125-094	1019429		
		1050 mm	PNS125-109	1019430		
		1200 mm	PNS125-124	1019431		
		1350 mm	PNS125-139	1019432		
		1500 mm	PNS125-154	1019433		
		1650 mm	PNS125-169	1019434		
				1800 mm	PNS125-184	1019435



## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for small housing profile	-	-	-	4032462
	Adapter for AR60, for small housing profile in PU3Hx-xxxxxxx device column				4056730

## Configuration tools

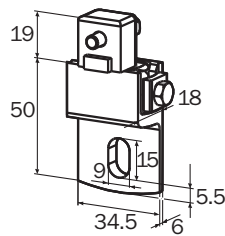
Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

Device protection

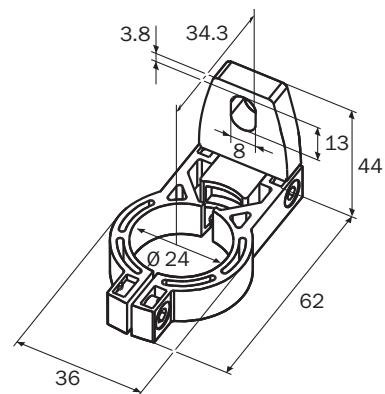
Figure	Description	Type	Part no.
	20 mm diameter	Test rod	2022600
	30 mm diameter	Test rod	2022602
	40 mm diameter	Test rod	2022604
	Test rod holder	BEF-3WNAAAAL1	2052249

Dimensional drawings mounting systems

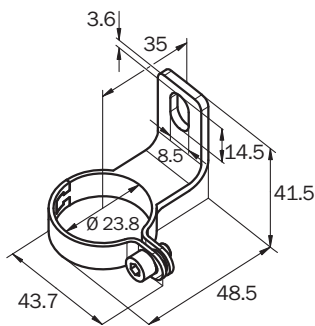
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



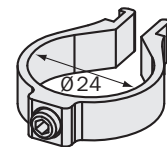
**BEF-2SMKEAKU4**  
Mounting kit 1, swivel mount



**BEF-2SMKEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMKEAAL4**  
Omega bracket, flexible and quick installation with only one screw

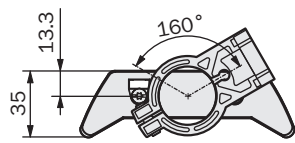


Dimensions in mm

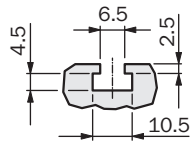
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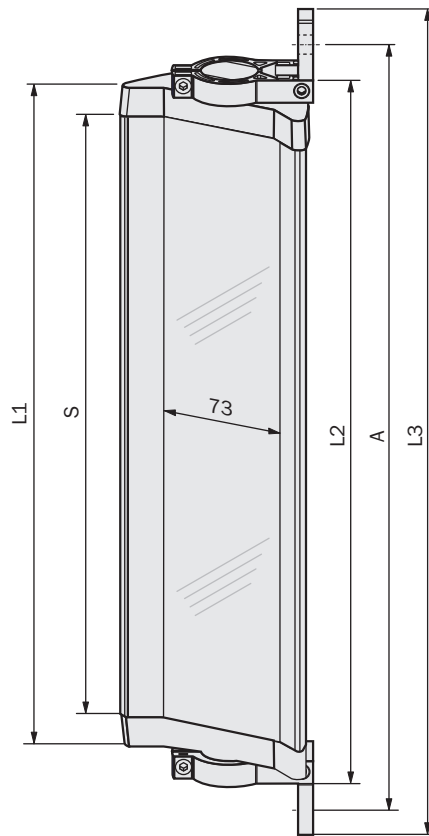
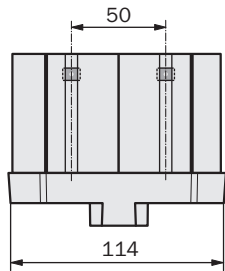
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

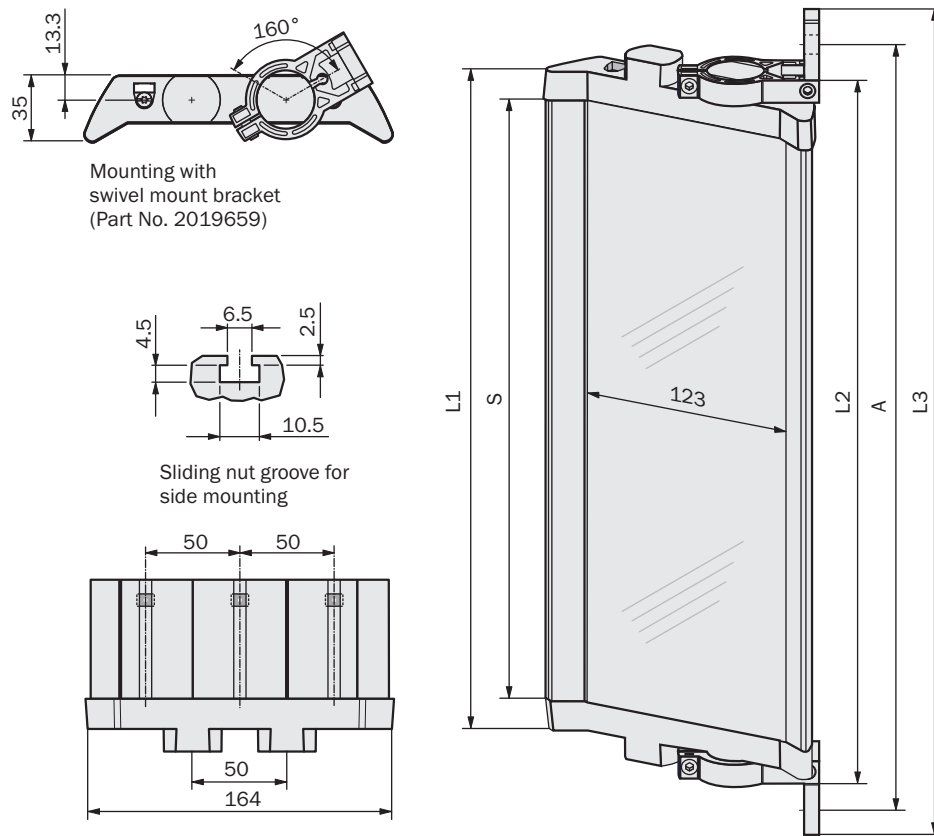


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

## Technical data overview

Protective field height (depending on type)	300 mm ... 1800 mm
Scanning range (depending on type)	0 m ... 6 m / 2.5 m ... 19 m
Resolution (depending on type)	20 mm / 30 mm / 40 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508), SILCL2 (IEC 62061)
Enclosure rating	IP 65

## Product description

With its high signal reserve, the C2000 Cascadable safety light curtain is also reliable under harsh industrial conditions. Functions and status information integrated in the device allow rapid commissioning and prevent unnecessary machine downtime.

The modular design provides maximum machine safety while taking into account economic considerations by precisely co-

ordinating the characteristics of the device to the requirements.

Safe control solutions and service concepts complete the product range to provide an ideal solution for the sector.

With the cascadable variants, safety light curtains can be flexibly adapted to the existing installation situation.

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Storage and conveyor technology
- Wood industry
- Paper and textile industry
- Stone production
- Electronics industry
- Packaging industry



Printing industry: C2000 Cascadable on a pad printing machine



- Cascade
  - Max. 3 devices
  - Max. 3 m cable length
- External device monitoring (EDM)
- Self-test
- 7-segment display
- Diagnostics
- Alignment aid
- Beam coding



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Further information	Page
→ Ordering information	F-286
→ Technical specifications	F-288
→ Dimensional drawings	F-290
→ Connection diagrams	F-292
→ Accessories	F-293
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### C2000 Cascadable

<b>Housing cross-section</b>	Protective field heights 150 mm to 1200 mm Protective field heights 1350 mm to 1800 mm	34 mm x 29 mm 48 mm x 40 mm
<b>Usage</b>	As first, middle or last system in a cascade	
<b>Connection types</b>	System connection: plug M12 x 8 Extension connection: socket M12 x 8	

■ Scanning range: 0 m ... 6 m

Resolution	Protective field height	Sender		Receiver	
		Type	Part no.	Type	Part no.
20 mm	300 mm	C20S-030102A21	1018072	C20E-030302A21	1018073
	450 mm	C20S-045102A21	1018078	C20E-045302A21	1018079
	600 mm	C20S-060102A21	1018055	C20E-060302A21	1018056
	750 mm	C20S-075102A21	1018095	C20E-075302A21	1018096
	900 mm	C20S-090102A21	1018104	C20E-090302A21	1018105
	1050 mm	C20S-105102A21	1018113	C20E-105302A21	1018114
	1200 mm	C20S-120102A21	1018122	C20E-120302A21	1016970
30 mm	300 mm	C20S-030103A21	1018074	C20E-030303A21	1016974
	450 mm	C20S-045103A21	1018080	C20E-045303A21	1018081
	600 mm	C20S-060103A21	1018087	C20E-060303A21	1018089
	750 mm	C20S-075103A21	1018097	C20E-075303A21	1018098
	900 mm	C20S-090103A21	1018106	C20E-090303A21	1018107
	1050 mm	C20S-105103A21	1018115	C20E-105303A21	1018116
	1200 mm	C20S-120103A21	1018123	C20E-120303A21	1018124
	1350 mm	C20S-135103A22	1018057	C20E-135303A22	1018058
	1500 mm	C20S-150103A22	1018133	C20E-150303A22	1018134
	1650 mm	C20S-165103A22	1018139	C20E-165303A22	1018140
1800 mm	C20S-180103A22	1018145	C20E-180303A22	1018147	
40 mm	300 mm	C20S-030104A21	1016967	C20E-030304A21	1016973
	450 mm	C20S-045104A21	1018082	C20E-045304A21	1018083
	600 mm	C20S-060104A21	1018090	C20E-060304A21	1018091
	750 mm	C20S-075104A21	1018099	C20E-075304A21	1018100
	900 mm	C20S-090104A21	1018108	C20E-090304A21	1018109
	1050 mm	C20S-105104A21	1018117	C20E-105304A21	1018118
	1200 mm	C20S-120104A21	1018125	C20E-120304A21	1018126
	1350 mm	C20S-135104A22	1018129	C20E-135304A22	1018130
	1500 mm	C20S-150104A22	1018135	C20E-150304A22	1018136
	1650 mm	C20S-165104A22	1018141	C20E-165304A22	1018142
	1800 mm	C20S-180104A22	1018148	C20E-180304A22	1018149

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## ■ Scanning range: 2.5 m ... 19 m

Resolution	Protective field height	Sender		Receiver	
		Type	Part no.	Type	Part no.
20 mm	300 mm	C20S-030202A21	1018075	C20E-030302A21	1018073
	450 mm	C20S-045202A21	1018084	C20E-045302A21	1018079
	600 mm	C20S-060202A21	1018092	C20E-060302A21	1018056
	750 mm	C20S-075202A21	1018101	C20E-075302A21	1018096
	900 mm	C20S-090202A21	1018110	C20E-090302A21	1018105
	1050 mm	C20S-105202A21	1018119	C20E-105302A21	1018114
	1200 mm	C20S-120202A21	1016964	C20E-120302A21	1016970
30 mm	300 mm	C20S-030203A21	1016968	C20E-030303A21	1016974
	450 mm	C20S-045203A21	1018085	C20E-045303A21	1018081
	600 mm	C20S-060203A21	1018093	C20E-060303A21	1018089
	750 mm	C20S-075203A21	1018102	C20E-075303A21	1018098
	900 mm	C20S-090203A21	1018111	C20E-090303A21	1018107
	1050 mm	C20S-105203A21	1018120	C20E-105303A21	1018116
	1200 mm	C20S-120203A21	1018127	C20E-120303A21	1018124
	1350 mm	C20S-135203A22	1018131	C20E-135303A22	1018058
	1500 mm	C20S-150203A22	1018137	C20E-150303A22	1018134
	1650 mm	C20S-165203A22	1018143	C20E-165303A22	1018140
1800 mm	C20S-180203A22	1018150	C20E-180303A22	1018147	
40 mm	300 mm	C20S-030204A21	1018077	C20E-030304A21	1016973
	450 mm	C20S-045204A21	1018086	C20E-045304A21	1018083
	600 mm	C20S-060204A21	1018094	C20E-060304A21	1018091
	750 mm	C20S-075204A21	1018103	C20E-075304A21	1018100
	900 mm	C20S-090204A21	1018112	C20E-090304A21	1018109
	1050 mm	C20S-105204A21	1018121	C20E-105304A21	1018118
	1200 mm	C20S-120204A21	1018128	C20E-120304A21	1018126
	1350 mm	C20S-135204A22	1018132	C20E-135304A22	1018130
	1500 mm	C20S-150204A22	1018138	C20E-150304A22	1018136
	1650 mm	C20S-165204A22	1018144	C20E-165304A22	1018142
	1800 mm	C20S-180204A22	1018151	C20E-180304A22	1018149

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	20 mm / 30 mm / 40 mm	
Scanning range (depending on type)	0 m ... 6 m / 2.5 m ... 19 m	-
Protective field height (depending on type)	300 mm ... 1800 mm	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (IEC 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	$2.2 \times 10^{-8}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Response time (depending on type)	-	Max. 34 ms
Synchronization	Optical, without separate synchronization	
Protection class	III	
Enclosure rating	IP 65 (EN 60529)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross-section (depending on type)		
Protective field heights 150 mm to 1200 mm	34 mm x 29 mm	
Protective field heights 1350 mm to 1800 mm	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	
Shock resistance	10 g, 16 ms (IEC 68-2-29)	

<sup>1)</sup> Between two demands on a safety-related response of the device at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics.  
For more detailed information on this topic, see page A-10.

### Functional data

System part	Sender	Receiver
External device monitoring	-	✓
Beam coding		✓
Extension connection		✓
Configuration method	Hard wired	

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## Electrical data

System part	Sender	Receiver
System connection	Plug M12 x 8	
Connecting cable length	Max. 15 m <sup>1)</sup>	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Extension connection	Socket M12 x 8	
Connection cable length	Max. 3 m	
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>2)</sup>	
Residual ripple	≤ 5 %	
Safety outputs (OSSD)		
	Type of output	-
	Switching voltage HIGH	-
	Switching current	-
		2 PNP semiconductors, short-circuit protected, cross-circuit monitored
		Min. $V_s - 2.25$ V DC
		Max. 500 mA
Display elements	LED/7-segment	

<sup>1)</sup> The length of the connecting cable is limited, because wire resistance is max. 4 Ohm

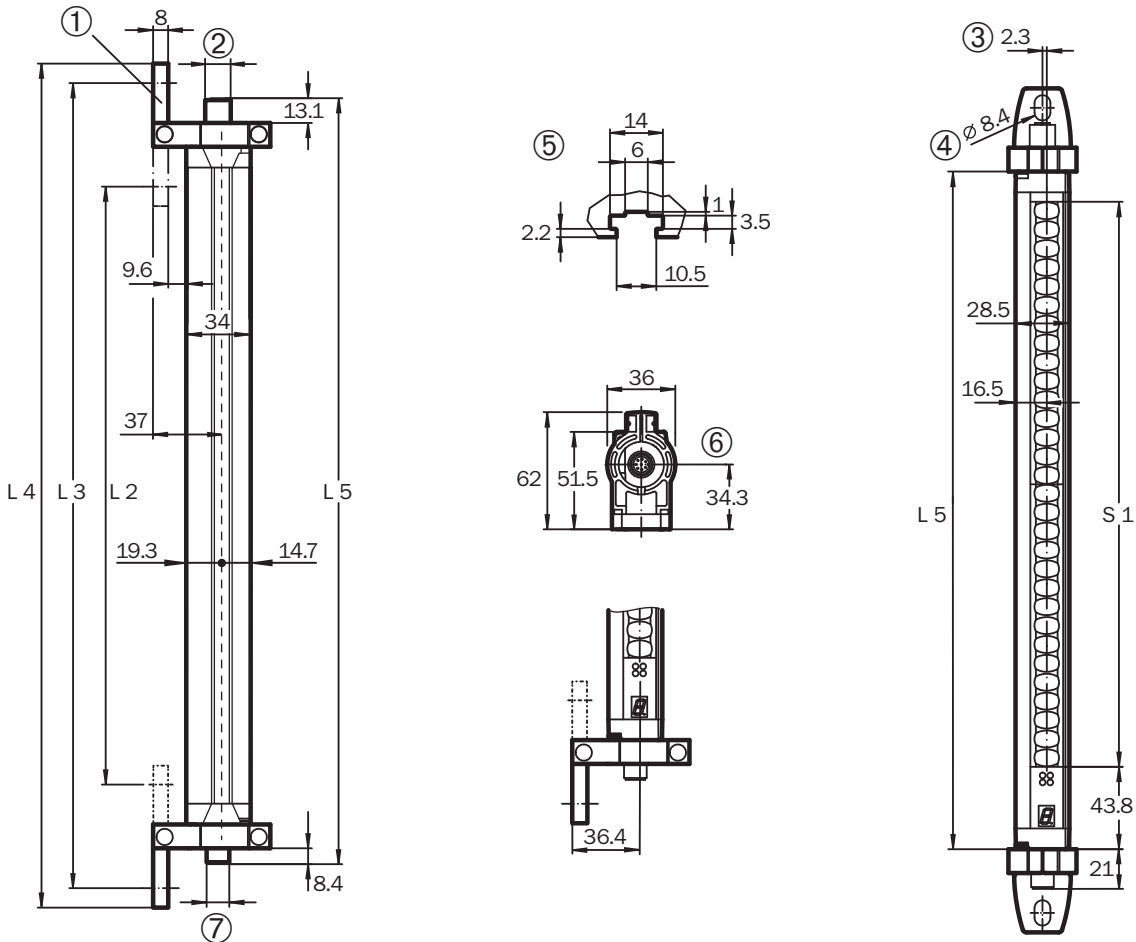
<sup>2)</sup> Upper and lower limit values of voltage supply not be infringed



# Dimensional drawings

Protective field heights 300 mm ... 1200 mm

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Sender with swivel mount, small housing (receiver mirror image)

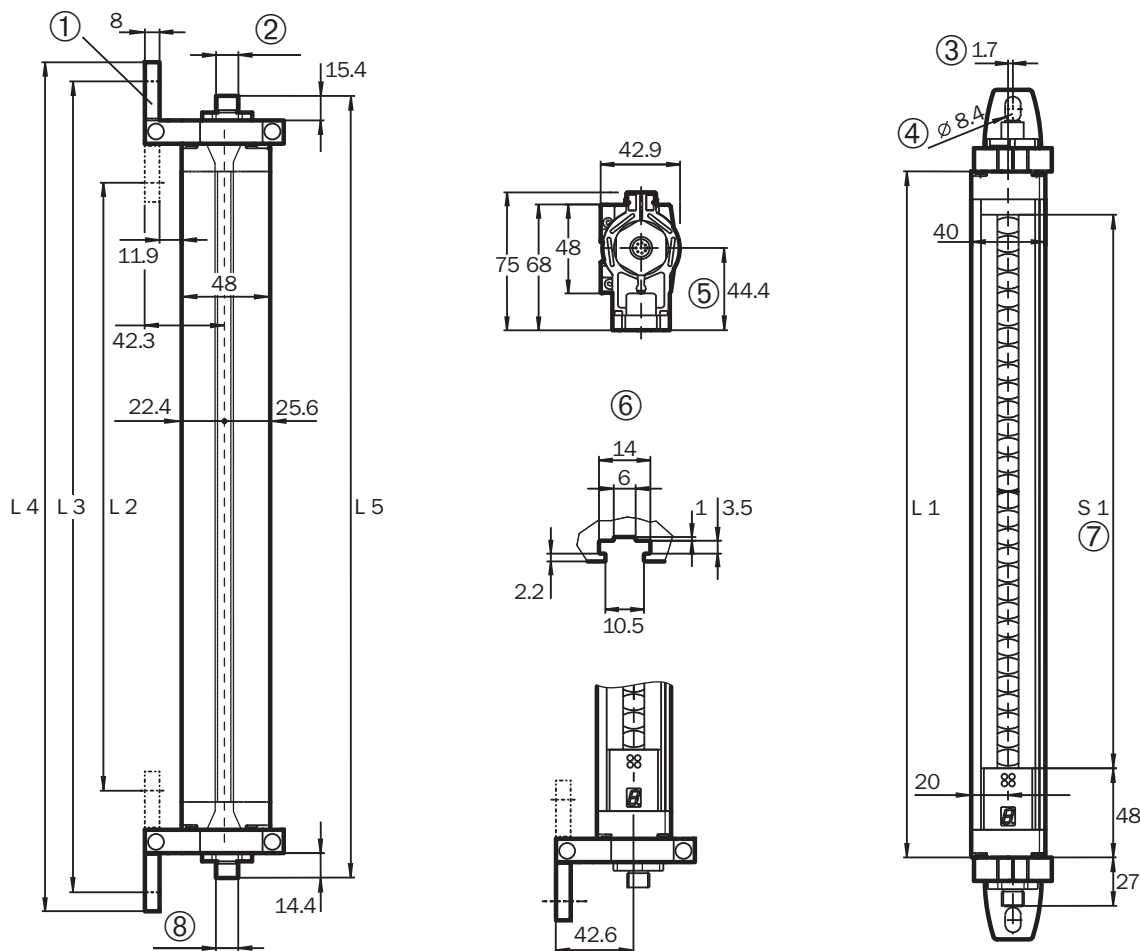
- ① Mounting clamp
- ② Plug M12 x 8
- ③ Center of light beam offset
- ④ Hexagon screw M8 DIN 933 with washer DIN 9021 (not supplied with delivery)
- ⑤ Sliding nut groove for side mounting
- ⑥ Adjustment
- ⑦ Plug M12 x 8

S1	L1	L2	L3	L4	L5
300	364	322	432	452	411
450	515	473	582	603	562
600	666	623	733	754	712
750	816	774	884	904	863
900	967	924	1034	1055	1013
1050	1117	1075	1185	1205	1164
1200	1266	1224	1334	1354	1313

Dimensions in mm



Protective field heights 1350 mm ... 1800 mm



Sender with swivel mount, large housing profile (receiver mirror image)

- ① Mounting clamp
- ② M12 x 8 socket
- ③ Center of light beam offset
- ④ Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ⑤ Adjustment
- ⑥ Sliding nut groove for side mounting
- ⑦ Protective field height
- ⑧ Plug M12 x 8

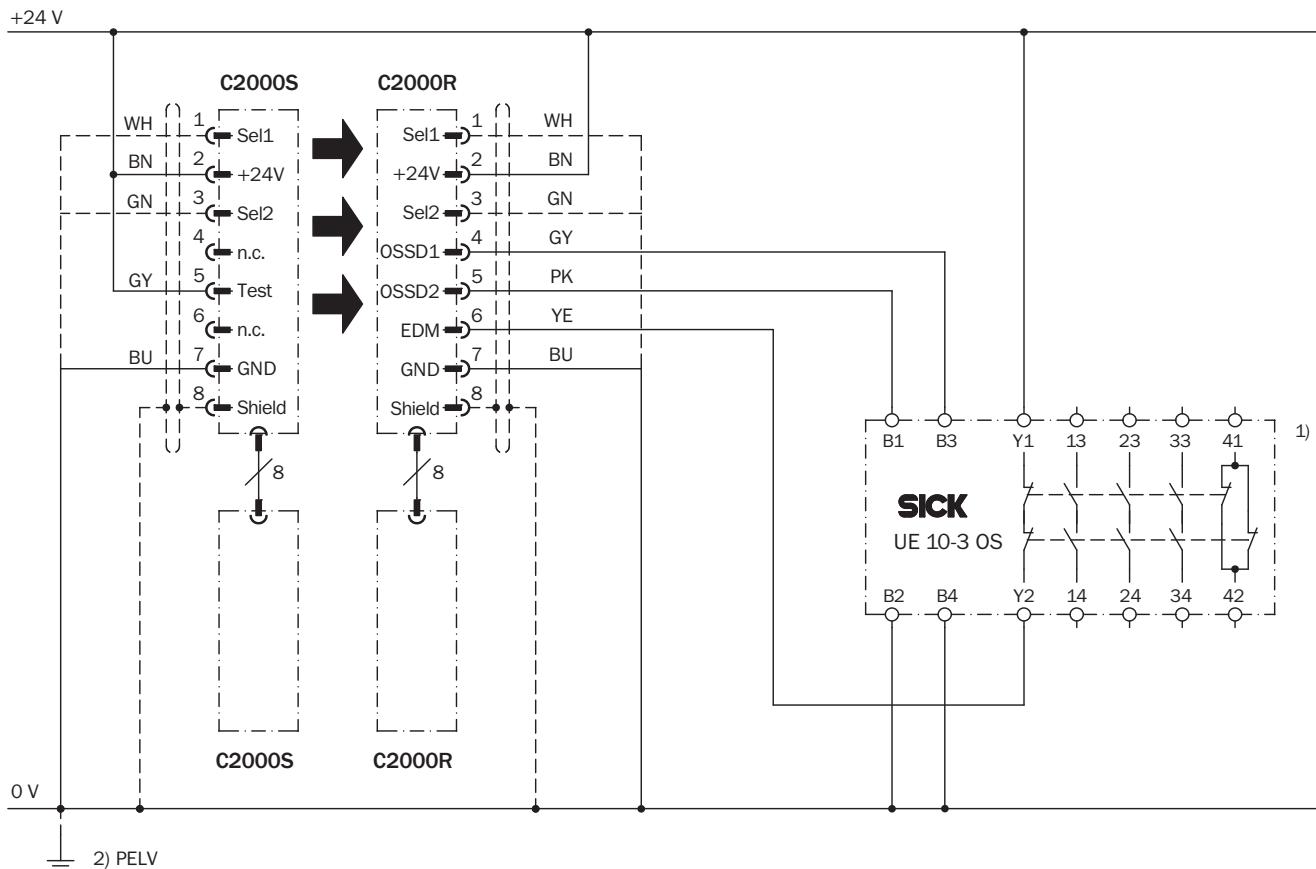
S1	L1	L2	L3	L4	L5
1350	1426	1384	1494	1514	1481
1500	1577	1535	1644	1665	1632
1650	1727	1685	1795	1815	1782
1800	1878	1836	1945	1966	1933

Dimensions in mm

# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## C2000 Cascadable on UE10-30S safety relay



### Task

Connection of two cascaded C2000 Cascadable safety light curtains to UE10-30S.

Operating mode: without restart interlock and with external device monitoring. Restart interlock is realized via the machine control.

### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the system is enabled. The OSSD1 and OSSD2 outputs are live, the UE10-30S is switched on. On the interruption of one of the light beams, the UE10-30S is deactivated by the OSSD1 and OSSD2 outputs.

### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of the UE10-30S will be detected. The shutdown function is retained.

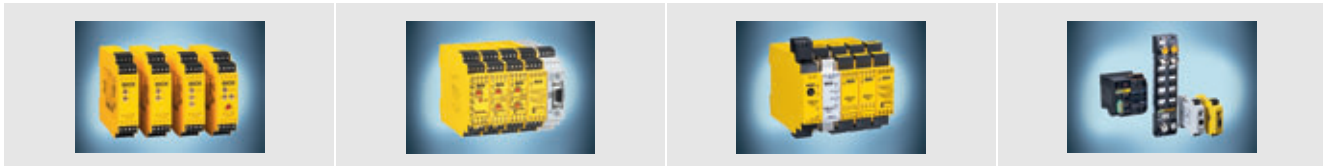
### Comments

1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) PELV in accordance with the requirements in EN 60204-1 / 6.4

Take note of the operating instructions of the integrated devices.







## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).









## Accessories

### Mounting systems for C2000, protective field heights 150 mm ... 1200 mm (small housing)


Figure	Description	Packing unit	Type	Part no.
	Mounting bracket, rigid	4	BEF-3WNKBAST4	2044068
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 1, swivel mount	4	BEF-2SMKEAKU4	2019649
	Stainless steel bracket, adjustable	4	BEF-2SMKEAES4	2030288
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMKEAAL4	2044848

F



## Mounting systems for C2000, protective field heights 1350 mm ... 1800 mm (large housing)

Figure	Description	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAL4	2044847

## Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirrors	Suitable for PNS75 and PNS125	6	2030600


## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
		Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343


## Cascade connection cables

Connection type	Direction of cable outlet	Cable length	Type	Part no.
M12 x 8	Plug straight/ socket straight	0.25 m	DSL-127SGM25E25KM0	6021000
		0.5 m	DSL-127SG0M5E25KM0	6021001
		1 m	DSL-127SG01ME25KM0	6021002
		1.5 m	DSL-127SG1M5E25KM0	6021003
		2 m	DSL-127SG02ME25KM0	6021004
		2.5 m	DSL-127SG2M5E25KM0	6021005
		3 m	DSL-127SG03ME25KM0	6021006

## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Device columns with external grooves



Figure	Description	Max. installation length	Suitable for protective field height	Type	Part no.
	Robust device column with two external mounting grooves	965 mm	150 ... 600 mm	PU3H96-00000000	2045490
		1165 mm	150 ... 900 mm	PU3H11-00000000	2045641
		1265 mm	150 ... 1050 mm	PU3H13-00000000	2045642
		1720 mm	150 ... 1350 mm	PU3H17-00000000	2045643
		2020 mm	150 ... 1650 mm	PU3H21-00000000	2045644
		2250 mm	150 ... 1800 mm	PU3H22-00000000	2045645
		2400 mm	150 ... 1800 mm	PU3H24-00000000	2045646

## Mirror columns with protective field height mirror




Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0

## Column parts and accessories


Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961

**Column parts and accessories (cont'd)**


Figure	Description	Packing unit	Type	Part no.
	Omega bracket, mounting kit for device columns, for C4000, C2000 and M2000 in large housing	2	BEF-2SMMEAL2	2045883
	Omega bracket, mounting kit for device columns, for C4000 and C2000 in small housing	2	BEF-2SMKEAL2	2045884
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

**Additional front screens**

F

Figure	Suitable for protective field height	Part no.
 Example of use	300 mm	2022405
	450 mm	2022406
	600 mm	2022407
	750 mm	2022408
	900 mm	2022409
	1050 mm	2022410
	1200 mm	2022411


**Additional heavy-duty front screens**

Figure	Suitable for protective field height	Part no.
 Example of use	1350 mm	2026860
	1500 mm	2026861
	1650 mm	2026862
	1800 mm	2026863




**PNS75 deflector mirrors**

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS75-034	1019414
		450 mm	PNS75-049	1019415
		600 mm	PNS75-064	1019416
		750 mm	PNS75-079	1019417
	Stainless steel	750 mm	PNS75-079S05	1046075
	Glass	900 mm	PNS75-094	1019418
		1050 mm	PNS75-109	1019419
		1200 mm	PNS75-124	1019420
		1350 mm	PNS75-139	1019421
		1500 mm	PNS75-154	1019422
		1650 mm	PNS75-169	1019423
		1800 mm	PNS75-184	1019424


## PNS125 deflector mirrors

Figure	Mirror material	For maximum protective field height	Type	Part no.
	Glass	300 mm	PNS125-034	1019425
		450 mm	PNS125-049	1019426
		600 mm	PNS125-064	1019427
		750 mm	PNS125-079	1019428
		900 mm	PNS125-094	1019429
		1050 mm	PNS125-109	1019430
		1200 mm	PNS125-124	1019431
		1350 mm	PNS125-139	1019432
		1500 mm	PNS125-154	1019433
		1650 mm	PNS125-169	1019434
		1800 mm	PNS125-184	1019435



## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	AR60 laser alignment aid	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column				4056731
	Adapter for AR60, for small housing profile	-	-	-	4032462
	Adapter for AR60, for small housing profile in PU3Hxx-xxxxxxx device column				4056730

## Configuration tools

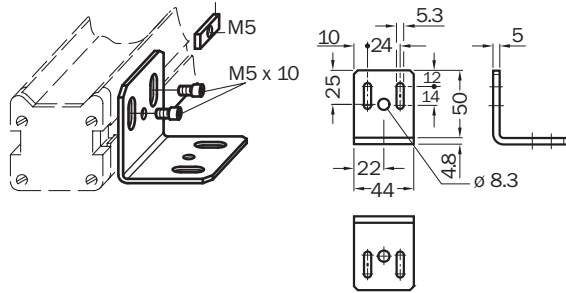
Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

## Device protection

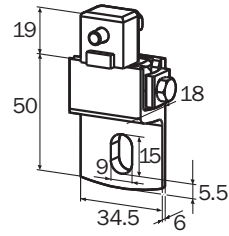
Figure	Description	Type	Part no.
	20 mm diameter	Test rod	2022600
	30 mm diameter	Test rod	2022602
	40 mm diameter	Test rod	2022604
	Test rod holder	BEF-3WNAAAAL1	2052249

Dimensional drawings mounting systems

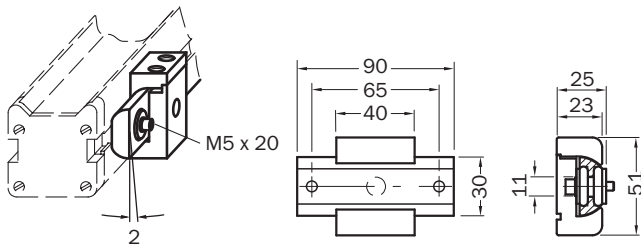
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



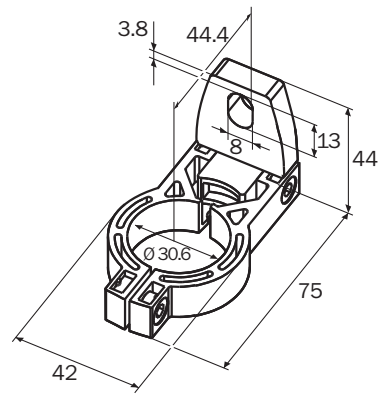
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



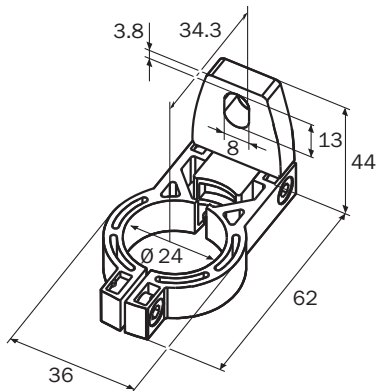
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



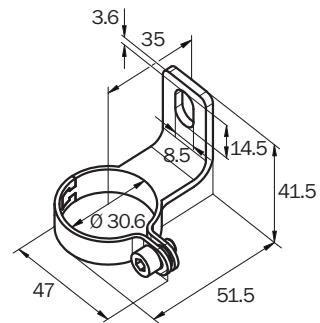
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



**BEF-2SMKEAKU4**  
Mounting kit 1, swivel mount



**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable

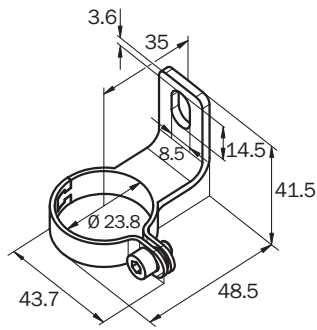


Dimensions in mm

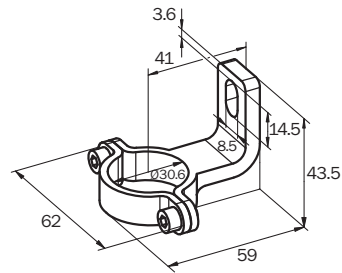
F



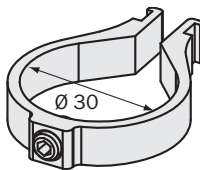
**BEF-2SMKEAES4**  
Stainless steel bracket, adjustable



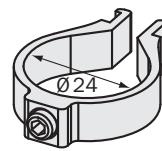
**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2SMMEAAL4**  
Omega bracket, flexible and quick installation with only one screw



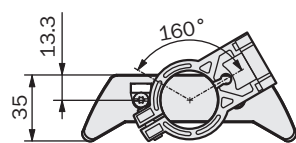
**BEF-2SMKEAAL4**  
Omega bracket, flexible and quick installation with only one screw



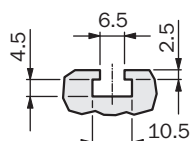
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Dimensions in mm

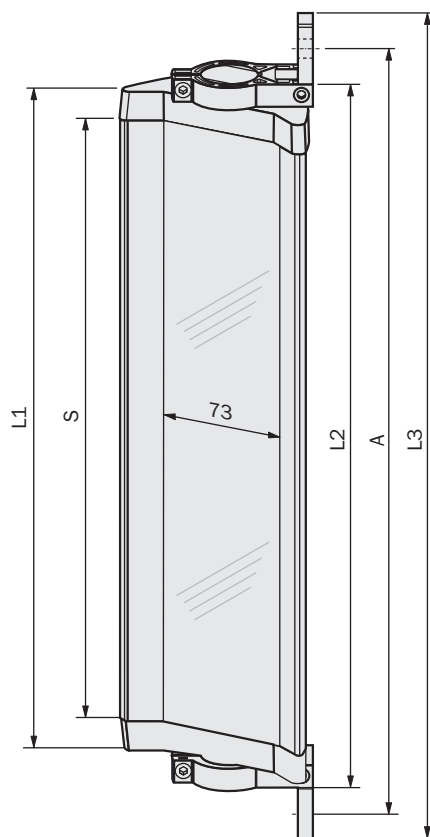
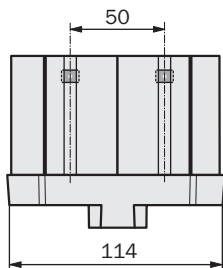
Dimensional drawings PNS75 deflector mirror



Mounting with swivel mount bracket (Part No. 2019659)



Sliding nut groove for side mounting

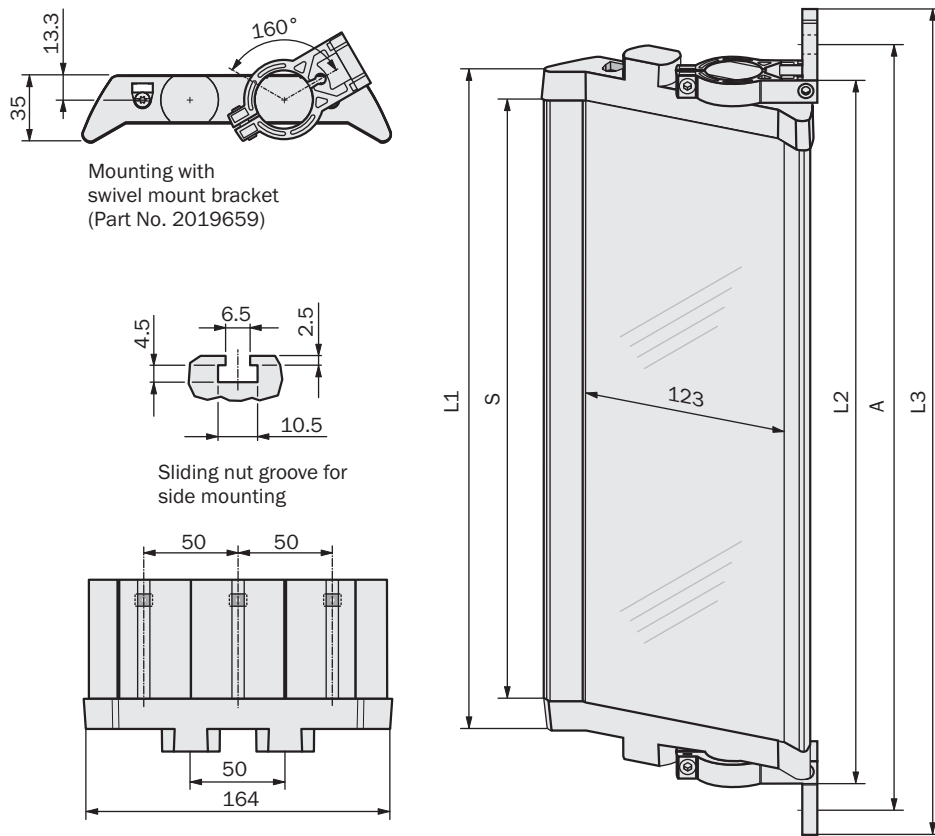


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Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

Dimensional drawings PNS125 deflector mirror



Mirror height S	L1	L2	L3	A
340	372	396	460	440
490	522	546	610	590
640	672	696	760	740
790	822	846	910	890
940	972	996	1060	1040
1090	1122	1146	1210	1190
1240	1272	1296	1360	1340
1390	1422	1446	1510	1490
1540	1572	1596	1660	1640
1690	1722	1746	1810	1790
1840	1872	1896	1960	1940

Dimensions in mm

F

## Multiple light beam safety devices

### Principle of operation of multiple light beam safety devices

Multiple light beam safety devices are electro-sensitive protective devices comprising a sender unit and a receiver unit or a sender/receiver unit on the active side and one or more deflector mirrors on the passive side. If one or more light beams are

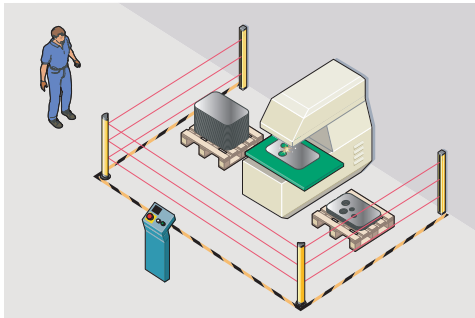
interrupted, the multiple light beam safety device provides a shutdown signal that is suitable for interrupting the dangerous state on a machine or system.

### Applications for multiple light beam safety devices

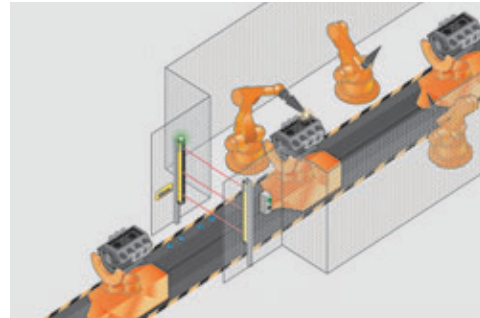
Multiple light beam safety devices are used wherever access to a hazardous area must be protected or the hazardous area itself must be monitored. In some applications, the protective

device must be able to unambiguously differentiate between man and material.

G



Machine tool industry: M4000 Standard with mirror column for multi-sided access protection on a punching machine



Automotive industry: M4000 Advanced with UE403 for access protection with muting on a motor machining station

### Advantages of the SICK multiple light beam safety device

SICK's range of multiple light beam safety devices provides a reliable, cost-effective solution for almost every hazardous area protection and access protection application. Customized solutions are produced using standard components that are flexible in use: from simple access protection to the complex muting application with direction monitoring, belt stop and override function.

The M4000 Standard and/or Advanced can be used for access protection and M4000 Area for hazardous area protection (horizontal use) if a type 4 multiple light beam safety device is required. M4000 Advanced, in combination with the UE403 switching amplifier, offers a comfortable, decentralized muting

solution where automatic material transport in and out of the hazardous area is required. In warehouse and conveyor systems, the M4000 Advanced with UE403 not only complies with safety requirements, but also provides highly efficient automatic material transport.

The M2000 is the right choice for applications where a type 2 multiple light beam safety device is desired. Product variants with differing functionalities are available for countless applications. The use of SICK interfaces also offers numerous advantages. The M2000 variants in IP69K housings were designed for environments in which very high demands are made of the enclosure rating (IP 69K) and the material strength.

### Mounting and operation made easy

SICK provides a comprehensive range of accessories for multiple light beam safety devices. These accessories make it possible to integrate the devices in the machine control and also to

mount the devices rapidly, reliably and safely. Device and mirror columns offer an efficient solution to create multi-sided access protection with minimum assembly.

### Services for productive safety

With services tailored specifically to your needs, SICK offers complete support for the safety of your machine or system.

Address productivity and cost-effectiveness from the start: from selection and planning, through commissioning and inspection, to maintenance and modernization.

→ For information about the services please refer to chapter B



Safety application	Type according to IEC 61496	Number of beams resp. resolution	Scanning range (m)	Ambient operating temperature (°C)	Functions						Product	Page	
					Sender/receiver system	Active/passive system	Muting	Beam coding	Restart interlock	External device monitoring			Safe device communication via EFI/SDL
	Type 4	2 ... 8	0.5 ... 70	-10 ... +55	✓	-	✓ <sup>1)</sup>	✓	✓	✓	✓	M4000 Advanced / UE403	G-2
		2 / 4 <sup>2)</sup>	0.5 ... 7.5 / 4.5	-10 ... +55	-	✓	✓ <sup>1)</sup>	✓	✓	✓	✓	M4000 Advanced A/P / UE403	
		2 ... 8	0.5 ... 70	-10 ... +55	✓	-	-	✓	✓	✓	-	M4000 Standard	G-21
		2 / 4 <sup>2)</sup>	0.5 ... 7.5 / 4.5	-10 ... +55	-	✓	-	✓	✓	✓	-	M4000 Standard A/P	
	Type 4	60 mm 80 mm	0.5 ... 19 0.5 ... 70	-10 ... +55	✓	-	-	✓	✓	✓	✓	M4000 Area	G-35
	Type 2			0 ... +55	✓	-	✓ <sup>3)</sup>	✓	-	✓	-	M2000 Standard	G-46
		2 ... 9	0 ... 25	0 ... +55	✓	-	✓ <sup>3)</sup>	✓	-	✓	-	M2000 Standard in IP69K Housing	G-57
		2 ... 4	0 ... 70	0 ... +55	✓	-	✓ <sup>3)</sup>	✓	✓	✓	-	M2000 RES/EDM	G-63
		2 ... 9	0 ... 25	0 ... +55	✓	-	✓ <sup>3)</sup>	✓	-	✓	-	M2000 Cascadable	G-74
				0 ... +55	-	✓	✓ <sup>3)</sup>	-	-	✓	-	M2000 A/P Standard	G-85
		1 <sup>2)</sup>	0 ... 6	0 ... +55	-	✓	✓ <sup>3)</sup>	-	✓	✓	-	M2000 A/P RES/EDM	G-94

<sup>1)</sup> Muting with UE403 switching amplifier

<sup>2)</sup> Passive side using deflector mirror/deflector unit

<sup>3)</sup> Muting with Flexi Classic safety controller

→ Suitable mirror columns and device columns can be found in chapter I



- Restart interlock (RES)
- External device monitoring (EDM)
- Beam coding
- LED/7-segment display
- Application diagnostic output (ADO)
- Configuration and diagnostics via PC
- SDL interface
- Muting configurable in conjunction with UE403
- A/P (active/passive) variant
- Integrated laser alignment aid (optional)
- End cap with integrated LED (optional)



## Technical data overview

Scanning range (depending on type)	0.5 m ... 70 m / 4.5 m / 7.5 m
Number of beams (depending on type)	2 ... 8
Beam separation (depending on type)	220 mm ... 600 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The M4000 Advanced multiple light beam safety device and the UE403 switching amplifier form the efficient solution for decentralized conventional muting applications involving automatic material transport.

Access protection with muting can be achieved with maximum availability, easily configured by PC via the RS-232 interface, and the simple in-situ connection of muting signals and control switches to the UE403. The integrated functions and status and diagnostic information permit rapid commissioning and prevent unnecessary machine downtime.

The modular concept provides a high level of machine safety that takes economic efficiency into account since device properties can be adapted to meet specific requirements. This is especially the case for the M4000 Advanced A/P (active/passive) variants, since only one requires electrical connection – considerably simplifying installation and cutting costs.

The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

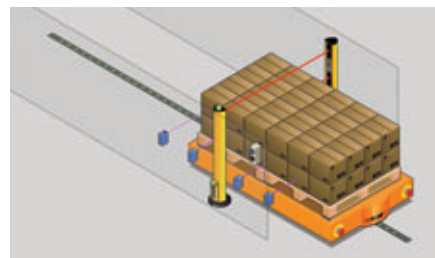
- Combined with safe control solutions by SICK
- Safe integration in network solutions
- M4000 Advanced with UE403 for the connection of:
  - 2 to 4 muting sensors
  - External muting lamp
  - Reset and override control switch
  - Conveyor belt stop signal
- Additional functions:
  - Concurrence monitoring
  - Total muting time monitoring
  - Sensor gap monitoring
  - Sensor test
  - Partial blanking
  - Muting end via ESPE
  - Integrated override
- Alternative to UE403: use of e.g., UE4155

→ For more combinations, see annex

## Applications

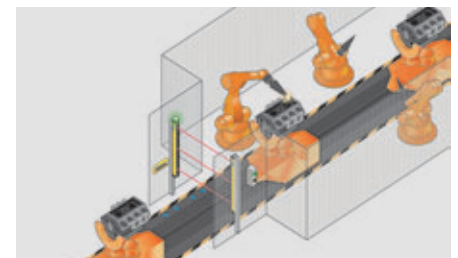
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

Provides access protection of hazardous areas on machining centers in mechanical engineering applications, robot systems



Access protection with partial blanking on a system with floor transporter

(such as welding lines in the automotive industry) and automated conveying, storage and transport systems.



Access protection with muting on a motor machining station

Further information	Page
→ Technical specifications	G-5
→ Dimensional drawings	G-11
→ Connection diagrams	G-13
→ Accessories	G-14
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### M4000 Advanced

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M40S-025003AA0	1200060	M40E-025003RB0	1200065
	600 mm	M40S-026003AA0	1200070	M40E-026003RB0	1200096
3	220 mm	M40S-032203AA0	1200063	M40E-032203RB0	1200097
	400 mm	M40S-034003AA0	1200061	M40E-034003RB0	1200064
	450 mm	M40S-034503AA0	1200071	M40E-034503RB0	1200098
4	220 mm	M40S-042203AA0	1200072	M40E-042203RB0	1200099
	300 mm	M40S-043003AA0	1200073	M40E-043003RB0	1200100
5	220 mm	M40S-052203AA0	1200074	M40E-052203RB0	1200101
6	220 mm	M40S-062203AA0	1200075	M40E-062203RB0	1200102
7	220 mm	M40S-072203AA0	1200076	M40E-072203RB0	1200103
8	220 mm	M40S-082203AA0	1200077	M40E-082203RB0	1200104

### M4000 Advanced, includes end cap with integrated LED

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M40S-025003AA0	1200060	M40E-025023RB0	1200062
	600 mm	M40S-026003AA0	1200070	M40E-026023RB0	1200079
3	220 mm	M40S-032203AA0	1200063	M40E-032223RB0	1200066
	400 mm	M40S-034003AA0	1200061	M40E-034023RB0	1200067
	450 mm	M40S-034503AA0	1200071	M40E-034523RB0	1200081
4	220 mm	M40S-042203AA0	1200072	M40E-042223RB0	_ 1)
	300 mm	M40S-043003AA0	1200073	M40E-043023RB0	1200109
5	220 mm	M40S-052203AA0	1200074	M40E-052223RB0	1208161
6	220 mm	M40S-062203AA0	1200075	M40E-062223RB0	1203850
7	220 mm	M40S-072203AA0	1200076	M40E-072223RB0	1201247
8	220 mm	M40S-082203AA0	1200077	M40E-082223RB0	1206683

<sup>1)</sup> When ordering for the first time, please use the information in the "Type" column instead of "Part no."

### M4000 Advanced, with integrated alignment aid

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M40S-025013AA0	1200057	M40E-025013RB0	1200058
	600 mm	M40S-026013AA0	1200078	M40E-026013RB0	1200105
3	400 mm	M40S-034013AA0	1200069	M40E-034013RB0	1200106
	450 mm	M40S-034513AA0	1200082	M40E-034513RB0	1200107
4	300 mm	M40S-043013AA0	1200080	M40E-043013RB0	1200108

## M4000 Advanced, with integrated alignment aid and end cap with integrated LED

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M40S-025013AA0	1200057	M40E-025033RB0	1200110
	600 mm	M40S-026013AA0	1200078	M40E-026033RB0	1200111
3	400 mm	M40S-034013AA0	1200069	M40E-034033RB0	1200068
	450 mm	M40S-034513AA0	1200082	M40E-034533RB0	1200112
4	300 mm	M40S-043013AA0	1200080	M40E-043033RB0	1200113

## M4000 Advanced A/P

Number of beams	Beam separation	Scanning range	Sender/receiver in one housing		Deflector unit	
			Type	Part no.	Type	Part no.
2	500 mm	7.5 m	M40Z-025003RB0	1200115	PSD01-1501 <sup>1)</sup>	1027906
		4.5 m	M40Z-025003TB0	1200128	PSD01-2501 <sup>2)</sup>	1027907
4	300 mm	4.5 m	M40Z-043003TB0	1200127	PSD02-2301 <sup>2)</sup>	1027908

<sup>1)</sup> With mirror deflection (max. effective scanning range 7.5 m)

<sup>2)</sup> With fiber-optic cable deflection (max. effective scanning range 4.5 m)



## M4000 Advanced A/P, includes end cap with integrated LED

Number of beams	Beam separation	Scanning range	Sender/receiver in one housing		Deflector unit	
			Type	Part no.	Type	Part no.
2	500 mm	7.5 m	M40Z-025023RB0	1200126	PSD01-1501 <sup>1)</sup>	1027906
		4.5 m	M40Z-025023TB0	1200125	PSD01-2501 <sup>2)</sup>	1027907
4	300 mm	4.5 m	M40Z-043023TB0	1200131	PSD02-2301 <sup>2)</sup>	1027908

<sup>1)</sup> With mirror deflection (max. effective scanning range 7.5 m)

<sup>2)</sup> With fiber-optic cable deflection (max. effective scanning range 4.5 m)

## UE403 switching amplifier

Type	Part no.
UE403-A0930	1026287



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### M4000 Advanced

#### General data

System part	Sender	Receiver
Number of beams (depending on type)	2 ... 8	
Beam separation (depending on type)	220 mm ... 600 mm	
Scanning range		
Configurable	-	✓
	-	0.5 m ... 20 m 15 m ... 70 m
Response time (depending on type)	-	Max. 12 ms
Protection class	III (EN 50178:1998)	
Enclosure rating	IP 65 (EN 60529)	
Synchronization	Optical, without separate synchronization	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$6.6 \times 10^{-9}$ (EN ISO 13849)	
$T_M$ (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature from ... to	-10 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross section	52 mm x 55.5 mm	
Vibration resistance	5 (10 ... 55), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Housing material	Aluminum alloy ALMGSI 0.5, powder coated	
Front screen material	Polycarbonate, scratch-resistant coating	
Integrated laser alignment aid		
Laser class	-	≤ 1 mW 2 (IEC 60825-1:2007) <sup>1)</sup>
Light sender/type of light	-	Laser (visible red light)
Wave length	-	630 nm ... 680 nm

<sup>1)</sup> Do not stare into beam!



## Functional data

System part	Sender	Receiver
Safe device communication via EFI/SDL		✓
Restart interlock	-	✓
Restart interlock (delivery status)	-	Internal
External device monitoring	-	✓
External device monitoring (delivery status)	-	Activated
Beam coding		✓
Beam coding (delivery status)		Non-coded
Configurable application diagnostic output	-	✓
Application diagnostic output (delivery status)	-	Contamination (OWS)
Sender test	✓	-
Sender test (delivery status)	Deactivated	-
Configurable scanning range	-	✓
Scanning range (delivery status)	-	20 m
Integrated laser alignment aid (optional) (depending on type)		- / ✓
End cap with integrated LED (optional) (depending on type)	-	- / ✓
SDL interface		✓
Configuration method	PC with CDS (configuration and diagnostic software)	
Concurrence monitoring (with UE403)	-	✓
Monitoring total muting time (with UE403)	-	✓
Sensor gap monitoring (with UE403)	-	✓
Sensor test (with UE403)	-	✓
Partial blanking (with UE403)	-	✓
End of muting by ESPE (with UE403)	-	✓
Belt stop (with UE403)	-	✓
Muting with override (with UE403)	-	✓

G

## Electrical data

System part	Sender	Receiver
System connection	M26 x 11 + FE Hirschmann plug	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Extension connection	-	Plug M12 x 5
Supply voltage $V_s$	24 V (19.2 V ... 28.8 V) <sup>2)</sup>	
Residual ripple	± 10 %	
Power consumption	Max. 0.2 A	Max. 0.6 A
Display elements	LED/7-segment	
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored <sup>3)</sup>
Switching voltage HIGH	-	24 V DC ( $V_S - 2.25 V \dots V_S$ )
Switching voltage LOW	-	2 V DC
Switching current	-	0 mA ... 500 mA
Application diagnostic output		
Switching voltage HIGH	-	24 V DC ( $V_S - 4.2 V \dots V_S$ )
Switching voltage LOW	-	High resistance
Switching current	-	0 mA ... 100 mA

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204.

<sup>3)</sup> Applies to a voltage range between -30 V and +30 V.



## M4000 Advanced A/P

## General data

System part	Sender/receiver in one housing	Deflector unit
Number of beams (depending on type)	2 / 4	
Beam separation (depending on type)	300 mm / 500 mm	
Scanning range	✓	-
Configurable		
Beam separation 300 mm	0.5 m ... 4.5 m	4.5 m
Beam separation 500 mm (depending on type)	0.5 m ... 7.5 m / 0.5 m ... 4.5 m	7.5 m / 4.5 m
Response time	Max. 10 ms	-
Protection class	III (EN 50178:1998)	-
Enclosure rating	IP 65 (EN 60529)	-
Synchronization	Optical, without separate synchronization	-
Safety related parameters		
Type	Type 4 (IEC 61496)	-
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	-
Category	Category 4 (EN ISO 13849)	-
Performance level	PL e (EN ISO 13849)	-
PFHd (mean probability of a dangerous failure per hour)	$6.6 \times 10^{-9}$ (EN ISO 13849)	-
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	-
Ambient operating temperature from ... to	-10 °C ... +55 °C	-
Storage temperature from ... to	-25 °C ... +70 °C	-
Air humidity from ... to	15 % ... 95 %, non-condensing	-
Housing cross section	52 mm x 55.5 mm	
Vibration resistance	5 (10 ... 55), IEC 60068-2-6	-
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	-
Housing material	Aluminum alloy ALMGSI 0.5, powder coated	-
Front screen material	Polycarbonate, scratch-resistant coating	-



## Functional data

System part	Sender/receiver in one housing	Deflector unit
Safe device communication via EFI/SDL	✓	-
Restart interlock	✓	-
Restart interlock (delivery status)	Internal	-
External device monitoring	✓	-
External device monitoring (delivery status)	Activated	-
Beam coding	✓	-
Beam coding (delivery status)	Non-coded	-
Configurable application diagnostic output	✓	-
Application diagnostic output (delivery status)	Contamination (OWS)	-
Configurable scanning range	✓	-
Scanning range (delivery status) (depending on type)	7.5 m / 4.5 m	-
End cap with integrated LED (optional) (depending on type)	- / ✓	-
SDL interface	✓	-
Configuration method	PC with CDS (configuration and diagnostic software)	-
Concurrence monitoring (with UE403)	✓	-
Monitoring total muting time (with UE403)	✓	-
Sensor gap monitoring (with UE403)	✓	-
Sensor test (with UE403)	✓	-
End of muting by ESPE (with UE403)	✓	-
Belt stop (with UE403)	✓	-
Muting with override (with UE403)	✓	-

## Electrical data

System part	Sender/receiver in one housing	Deflector unit
System connection	M26 x 11 + FE Hirschmann plug	-
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	-
Connecting cable length	Max. 50 m <sup>1)</sup>	-
Extension connection	Plug M12 x 5	-
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC)	-
Residual ripple	± 10 %	-
Power consumption	Max. 0.6 A	-
Safety outputs (OSSD)		
Type of output	2 PNP semiconductors, short-circuit protected, cross-circuit monitored <sup>2)</sup>	-
Switching voltage HIGH	24 V DC ( $V_s - 2.25 V \dots V_s$ )	-
Switching voltage LOW	2 V DC	-
Switching current	0 mA ... 500 mA	-
Application diagnostic output		
Switching voltage HIGH	PNP semiconductor, short-circuit protected 24 V DC ( $V_s - 4.2 V \dots V_s$ )	-
Switching voltage LOW	High resistance	-
Switching current	0 mA ... 100 mA	-
Display elements	LED/7-segment	-

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> Applies to a voltage range between -30 V and +30 V.

## UE403 switching amplifier

## General data

Type of muting sensors	Optical sensors, inductive sensors, mechanical switches, controller signals
Protection class	III (EN 50178:1998)
Enclosure rating	IP 65 (IEC 60529)
Safety related parameters	
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$1.0 \times 10^{-8}$ (EN ISO 13849) <sup>1)</sup>
T <sub>M</sub> (Mission Time)	18 years (EN ISO 13849) <sup>1)</sup>
Ambient operating temperature from ... to	-10 °C ... +55 °C
Air humidity from ... to	15 % ... 95 %, non-condensing
Storage temperature from ... to	-25 °C ... +70 °C
Vibration resistance	5, 10 ... 55 (IEC 60068-2-6)
Shock resistance	10 g, 16 ms (IEC 60068-2-29)
Housing material	Die-cast aluminum powder coated
Material, connector strip	Polyamide
Assembly	Flexible mounting to the M4000 Advanced or directly in the system

<sup>1)</sup> Only in conjunction with M4000 Advanced or M4000 Advanced A/P

## Electrical data

Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC), via connected ESPE
Power consumption	Max. 2 A
Inputs override, reset, C1, belt stop, muting sensors	
Switching voltage HIGH	24 V DC (11 V DC ... 30 V DC)
Input current HIGH	10 mA (6 mA ... 15 mA)
Switching voltage LOW	0 V DC (-30 V DC ... 5 V DC)
Input current LOW	0 mA (-0.5 mA ... 1.5 mA)
Outputs voltage supply for reset, override, C1, muting sensors	
Supply voltage	24 V DC (15 V DC ... 28.8 V DC)
Output current for muting sensors	Max. 500 mA <sup>1)</sup>
Output current for reset, override, C1	400 mA <sup>1)</sup>
Muting lamp	
Output current	Monitored 20 mA ... 400 mA at max. 5 W power consumption Not monitored 0 mA ... 400 mA at max. 5 W power consumption
Connection type	Socket M12 x 5
Cable length	Max. 10 m <sup>2)</sup>
Wire cross-section	0.34 mm <sup>2</sup>
Cable resistance	< 0.5 Ohm (per cable)

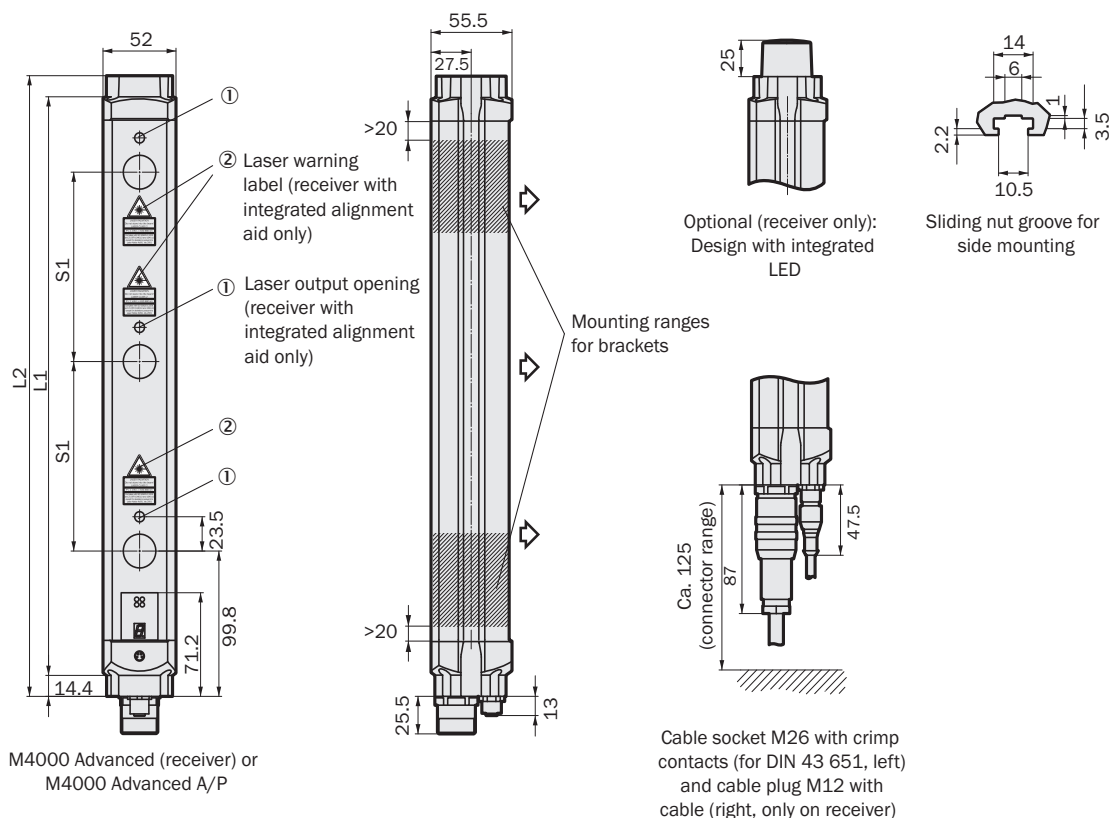
<sup>1)</sup> Total of all supply currents from the connections RES/OVR, A1, A2, B1 and B2 (pin 1 in each case): max. 1000 mA

<sup>2)</sup> Between UE403 and M4000 Advanced / Advanced Curtain as well as between the muting sensors/control switches/muting lamp and UE403



# Dimensional drawings

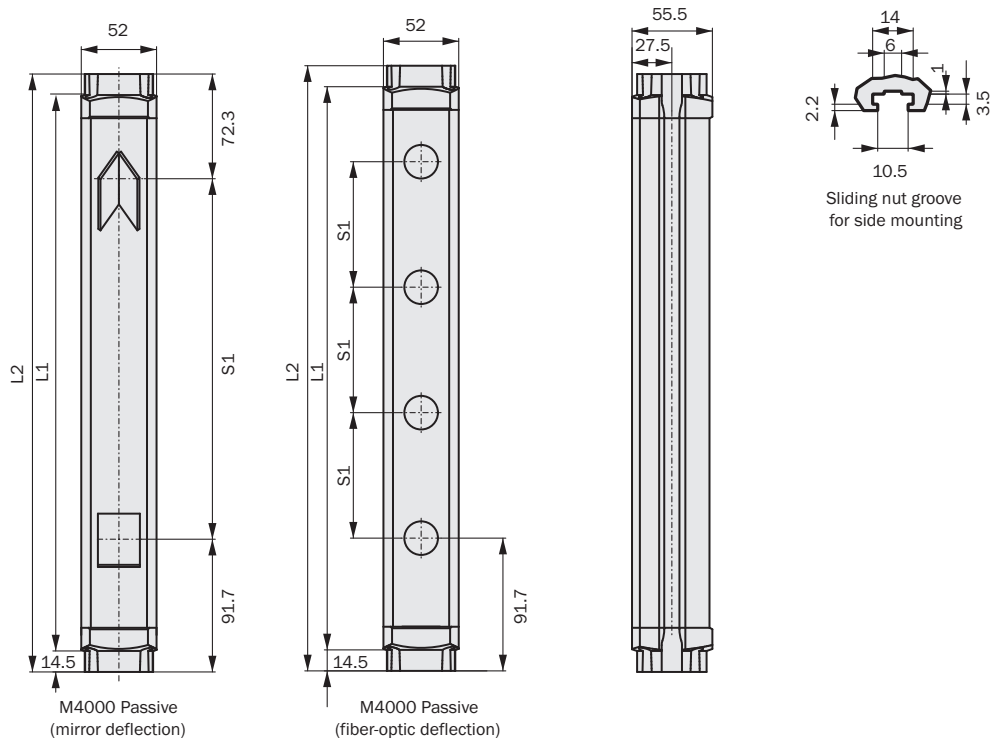
## M4000 Advanced, M4000 Advanced A/P



Number of beams	Beam separation S1	L1	L2
2	500	643	672
2	600	743	772
3	220	583	612
3	400	943	972
3	450	1043	1072
4	220	803	832
4	300	1043	1072
5	220	1023	1052
6		1243	1272
7		1462	1491
8		1682	1711

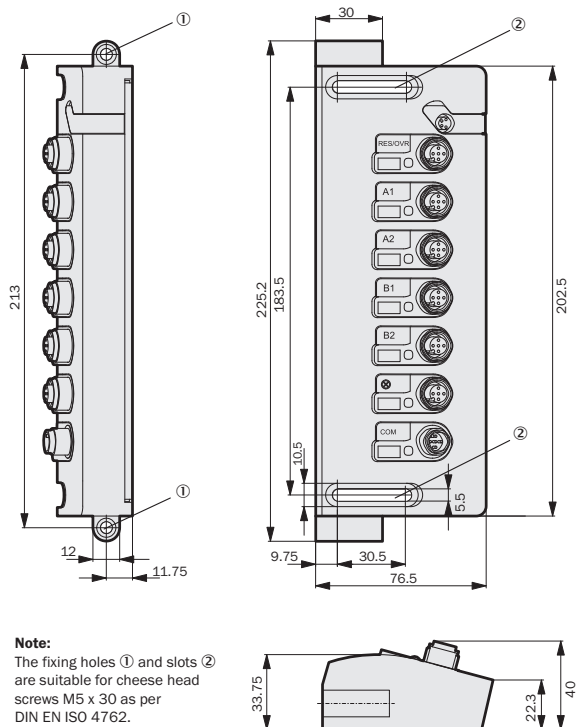
Dimensions in mm

Deflector units for M4000 Advanced A/P



Number of beams	Beam separation S1	L1	L2
2	500	643	672
4	300	1043	1072

UE403 switching amplifier



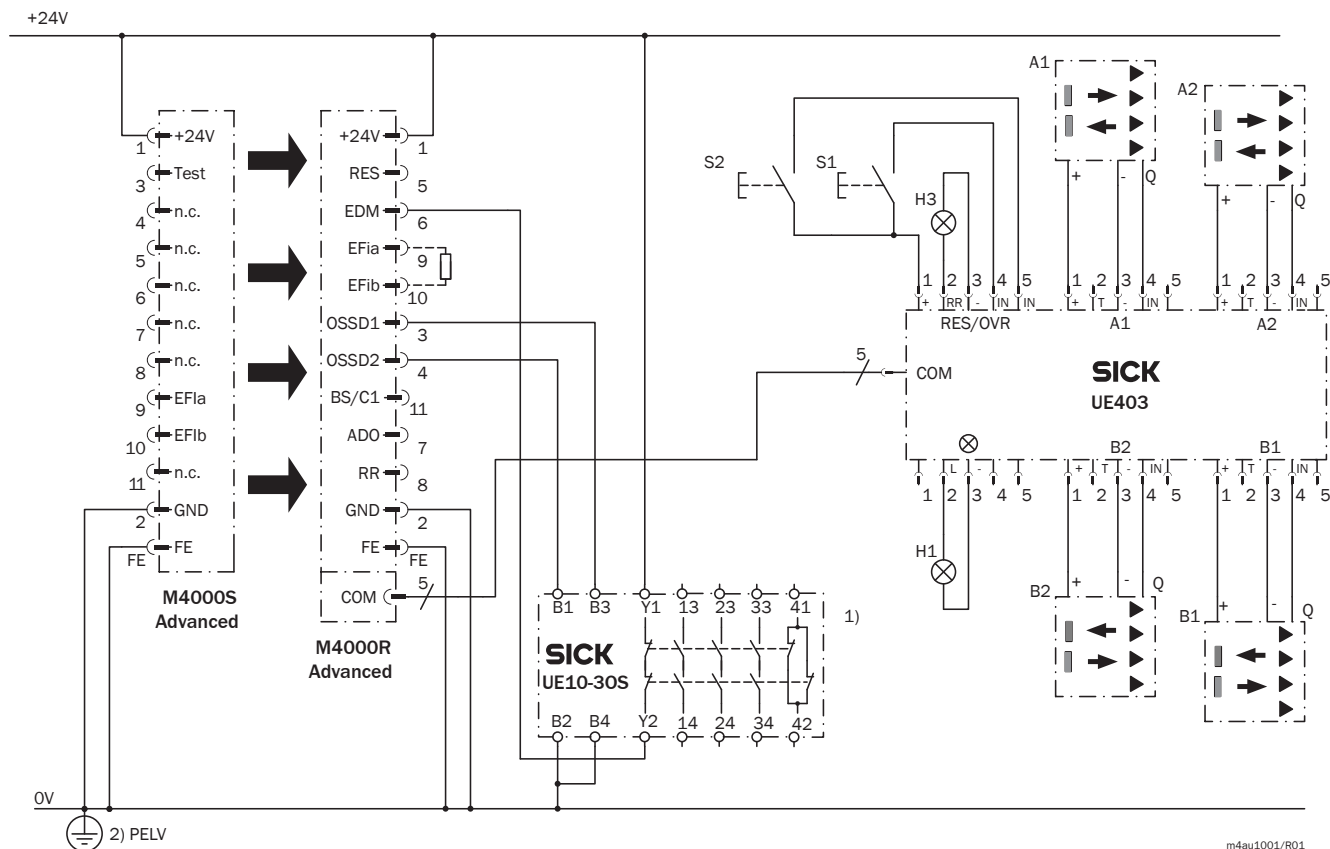
Dimensions in mm



## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### M4000 Advanced with UE403 switching amplifier connected to UE10-30S safety relay



#### Task

Connection of an M4000 Advanced multiple light beam safety device with UE403 switching amplifier to a UE10-30S safety relay.

Muting with 4 photoelectric reflex switches (dark-switching, PNP).

Operating mode: with restart interlock and external device monitoring.

#### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the yellow LED on the receiver and the H3 lamp flash. The system is ready for switch-on and waits for an input signal/switch-on signal. The system is enabled by pressing and releasing the S1 button. The OSSD1 and OSSD2 outputs are live, the UE10-30S is switched on. On interruption of one or several of the light beams, the UE10-30S is de-energized by the OSSD1 and OSSD2 outputs.

#### Muting and override

When the light path is clear and the muting input conditions are valid, muting starts. The H1 muting lamp illuminates. Different time and monitoring functions can be configured.

When the light path is interrupted and muting sensors are active, e.g., because of muting errors or a new power on, override is enabled by pressing and releasing the S2 button.

#### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of the UE10-30S will be detected. The shutdown function is retained. On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits.

The failure of one muting sensor will be detected by the muting sequence and prohibit a new muting cycle. On manipulation (e.g., jamming) of the S2 button, the system does not enable override. A permanent use of the override function will be inhibited through the device.

#### Comments

1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel insertion in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) PELV in accordance with the requirements in EN 60204-1 / 6.4

Take note of the operating instructions of the integrated devices. This applies particularly to the use of configurable functions.

## sens:Control – safe control solutions








Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).


## Accessories

### M4000 Advanced


#### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 12, swivel mount	4	BEF-2SMGEAKU4	2030510
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMGEAAL4	2044846



#### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirror	Suitable for PNS75 and PNS125	6	2030600


#### Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	DOL-0612G2M5075KM0	2022544
			5 m	DOL-0612G05M075KM0	2022545
			7.5 m	DOL-0612G7M5075KM0	2022546
			10 m	DOL-0612G10M075KM0	2022547
			15 m	DOL-0612G15M075KM0	2022548
			20 m	DOL-0612G20M075KM0	2022549
			30 m	DOL-0612G30M075KM0	2022550


**Cable receptacles**

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758

**Extension connection cables**

Figure	Connection type	Direction of cable outlet	Cable length	Remark	Type	Part no.
	Plug M12 x 5, socket M12 x 5	Plug straight/ socket straight	0.6 m	Connection cable for M4000 Advanced with M12, 5-pin connector and UE403	DSL-1205-G0M6C	6025930
			1 m		DSL-1205G01MC	6029280
			1.5 m		DSL-1205G1M5C	6029281
			2 m		DSL-1205-G02MC	6025931
			5 m		DSL-1205G05MC	6029282


**Configuration connection cables**

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649


**Terminators**

Description	Remark	Type	Part no.
Terminal with 182 Ω resistance for pin 9 and 10 on the system connection	For improving the EMC behavior if EFI device communication is not used	Terminal with 182 Ω resistance	2027227


**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789


## Device columns with external grooves

Figure	Description	Max. installation length	Number of beams	Beam separation	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	2	500 mm	PU3H96-00000000	2045490
		1165 mm	3	400 mm	PU3H11-00000000	2045641
		1265 mm	4	300 mm	PU3H13-00000000	2045642
		1720 mm	-	-	PU3H17-00000000	2045643
		2020 mm	-	-	PU3H21-00000000	2045644
		2250 mm	-	-	PU3H22-00000000	2045645
		2400 mm	-	-	PU3H24-00000000	2045646

## Device columns for outdoor use

Figure	Description	Number of beams	Beam separation	Suitable for	Type	Part no.
	With front screen heating, 220 V, including brackets and cable socket (without multiple light beam safety device)	2	500 mm	M40x-0250x0xx0, M40Z-025000xR0, M40x-0250x3xx0, M40Z-025003xx0	PUM12-S02	2019654
		3	400 mm	M40x-0340x0xx0, M40x-0340x3xx0	PUM12-S01	2020800

## Mirror columns with separate mirrors





Figure	Column height	Suitable for	Remark	Type	Part no.
 <small>Product may differ from illustration</small>	985 mm	M40x-0250xxxx, M20x-02x05xxxx	Completely mounted, including mirrors	PM3S96-00240020	1040619
		M40x-0260xxxx		PM3S96-00230060	1040620
	1185 mm	M40x-0340xxxx, M20x-03x40x1xx		PM3S11-00330030	1040625
	1285 mm	M40x-0345xxxx		PM3S13-00330050	1040624
		M40x-0430xxxx, M20x-04x30xxxx		PM3S13-00430040	1040626

## Mirror columns with protective field height mirror


Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0


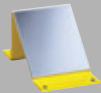
## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMGEAAL2	2045736
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938



## Additional front screen

Figure	Suitable for	Remark	Packing unit	Part no.
 Example of use	M40x-0250xxxx	Including sliding nuts and fixing screws	2	2033225
	M40x-0260xxxx			2033226
	M40x-0322xxxx			2033227
	M40x-0340xxxx			2033228
	M40x-0345xxxx			2033229
	M40x-0422xxxx			2033230
	M40x-0522xxxx			2033231
	M40x-0622xxxx			2033232
	M40x-0722xxxx			2033233
	M40x-0822xxxx			2033234

## Deflector mirrors

Figure	Mirror surface	Remark	Type	Part no.
	75 mm x 80 mm	Including mounting adapter (two swivel mounts)	PNS75-008	1026647
	80 mm x 97 mm	For 90° deflection, incl. mounting set, not suitable for column mounting	PSK45	5306053


## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter AR60 for M4000	-	-	-	4040006
	Alignment template, for M4000 with integrated laser	-	-	-	4040263



**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Configuration tools**

Figure	Description	Type	Part no.
	For saving and transferring configurations. For C4000 Standard, Advanced, Palletizer, Entry/Exit, Fusion and M4000 Advanced, Advanced Curtain, Area	Clone plug for C4000 and M4000	1029665
	-	Wall mount	5318443


**Muting mechanic kits**

Figure	Description	Suitable for	Type	Part no.
	Cross muting (2 sensors), muting sensor brackets for mounting on M4000 housing profile or device columns with external mounting grooves	Muting with two crossed-muting sensors for M4000 Advanced A/P and PU3Hxx device columns	M4000 muting arm-kit with two crossed-muting sensors	2046171
	Parallel muting (4 sensors), muting sensor brackets for mounting on M4000 housing profile or device columns with external mounting grooves	Muting with four parallel-muting sensors for M4000 Advanced A/P and PU3Hxx device columns	M4000 muting arm-kit with four parallel-muting sensors	2046170



**UE403 switching amplifier****Mounting systems**

Description	Remark	Packing unit	Type	Part no.
Fixing screws with sliding nuts	Included in the delivery	2	Fixing screws	2033250


**Connecting cables**

Figure	Connection type	Direction of cable outlet	Cable length	Part no.
	Plug M12 x 5	Straight	2 m	6026133
			5 m	6026134
			10 m	6026135


**Connectors**

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Plug M12 x 4	Straight	STE-1204-G	6009932
	Socket M12 x 4	Angled	DOS-1204-W	6007303

**Extension connection cables**

Figure	Connection type	Direction of cable outlet	Cable length	Remark	Type	Part no.
	Plug M12 x 5, socket M12 x 5	Plug straight/ socket straight	0.6 m	Connection cable for M4000 Advanced with M12, 5-pin connector and UE403	DSL-1205-G0M6C	6025930
			1 m		DSL-1205G01MC	6029280
			1.5 m		DSL-1205G1M5C	6029281
			2 m		DSL-1205-G02MC	6025931
			5 m		DSL-1205G05MC	6029282

**Configuration connection cables**

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

**Muting sensor connecting cables**


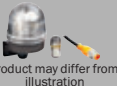
Connection type	Direction of cable outlet	Cable length	Description	Type	Part no.
Plug M12 x 3	Plug straight/ socket angled	1 m	Suitable for WT27, WL260, WT260 muting sensors; pin 2 (plug) not connected	DSL-1203B01MC34KM1	6026106
		2 m		DSL-1203B02MC34KM1	6026107
		5 m		DSL-1203B05MC34KM2	6025118
Plug M12 x 4	Plug straight/ socket angled	1 m	Suitable for WL24 and WT24 muting sensors	DSL-1204B01MC34KM0	6025974
				Suitable for WL12, WL14, WL18, WL23, WL27 muting sensors; pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	DSL-1204B01MC34KM2
		2 m	Suitable for WL24 and WT24 muting sensors	DSL-1204B02MC34KM0	6025975
				Suitable for WL12, WL14, WL18, WL23, WL27 muting sensors; pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	DSL-1204B02MC34KM2
		5 m	Suitable for WL24 and WT24 muting sensors	DSL-1204B05MC34KM1	6025087
				Suitable for WL12, WL14, WL18, WL23, WL27 muting sensors; pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	DSL-1204B05MC34KM2

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**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Muting indicator lamps**

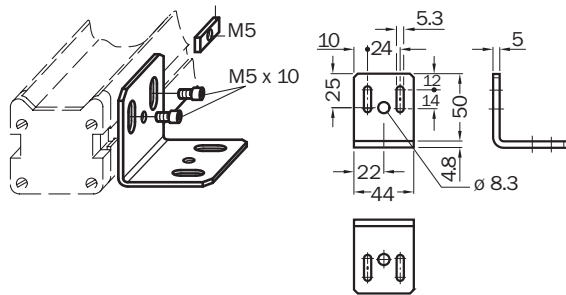
Figure	Type of muting indicator	Connection type	Cable length	Remark	Part no.
 Product may differ from illustration	LED	Connector	2 m	Incl. mounting bracket and mounting kit	2033118
			10 m	Incl. mounting bracket	2033119
 Product may differ from illustration	Incandescent lamp	Connector	2 m	Incl. mounting bracket and mounting kit	2033116
			10 m	Incl. mounting bracket	2033117

**Muting accessories, other**

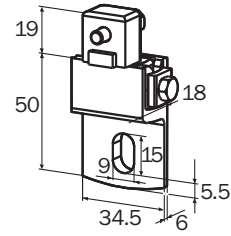
Figure	Type	Part no.
	Protective cap for device socket	6011170

Dimensional drawings mounting systems

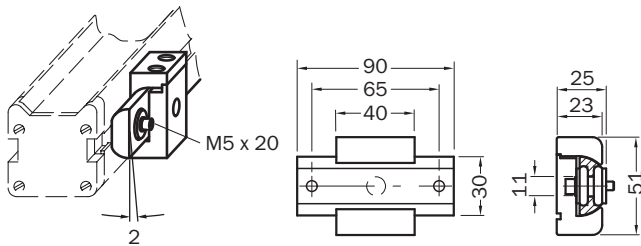
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



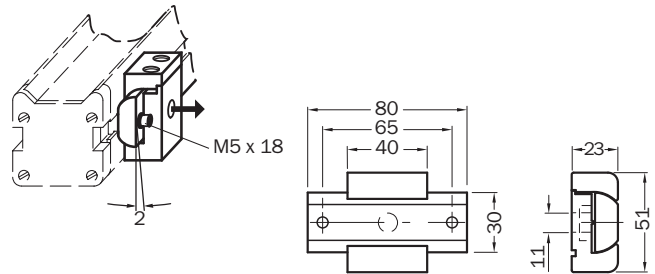
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



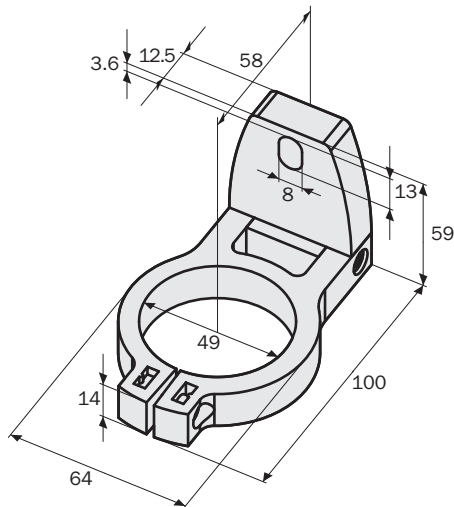
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



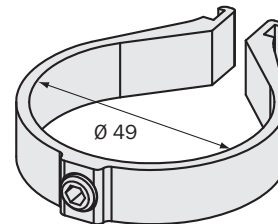
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



**BEF-2SMGEAKU4**  
Mounting kit 12, swivel mount



**BEF-2SMGEAAL4**  
Omega bracket, flexible and quick installation with only one screw



Dimensions in mm

G



## Technical data overview

Scanning range (depending on type)	0.5 m ... 70 m / 4.5 m / 7.5 m
Number of beams (depending on type)	2 ... 8
Beam separation (depending on type)	220 mm ... 600 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The M4000 Standard multiple light beam safety device is the solution for one-sided or multi-sided access protection. Efficient perimeter guarding solutions with maximum availability are created due to the M4000's high optical range and comprehensive functions, which are easily configured via buttons. The integrated functions and status information ensure rapid com-

missioning and help to minimize machine downtime. The modular concept cost-effectively achieves maximum machine safety by coordinating the characteristics of the device precisely to the users' requirements. Interfaces and service concepts complete the product range to give an ideal industrial solution.

## In-system added value

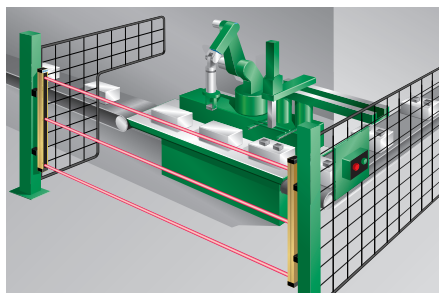
- Combined with SICK safe control solutions
- Safe integration in network solutions
- Direct integration in AS-Interface Safety at Work bus systems

→ For more combinations; see annex

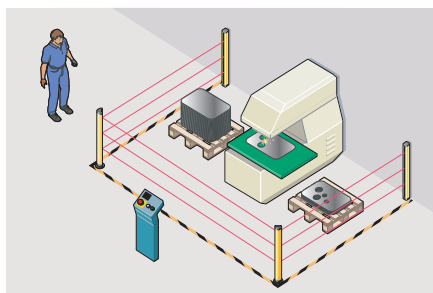
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Machine tool industry
- Storage and conveyor
- Packaging industry
- Stone production
- Automotive industry



M4000 Standard on a packaging machine



M4000 Standard with mirror columns on a punching machine



- Housing with 3 nut grooves
- Configuration buttons
- Restart interlock (RES)
- External device monitoring (EDM)
- Beam coding
- LED/7-segment display
- Application diagnostic output (ADO)
- Integrated laser alignment aid (optional)
- End cap with integrated LED (optional)
- Separate reset connection for receiver (optional)



Further information	Page
→ Ordering information	G-22
→ Technical specifications	G-24
→ Dimensional drawings	G-11
→ Connection diagrams	G-30
→ Accessories	G-31
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### M4000 Standard

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M40S-025000ARO	1200000	M40E-025000RRO	1200017
	600 mm	M40S-026000ARO	1200001	M40E-026000RRO	1200018
3	220 mm	M40S-032200ARO	1200002	M40E-032200RRO	1200019
	400 mm	M40S-034000ARO	1200003	M40E-034000RRO	1200020
	450 mm	M40S-034500ARO	1200004	M40E-034500RRO	1200021
4	220 mm	M40S-042200ARO	1200005	M40E-042200RRO	1200022
	300 mm	M40S-043000ARO	1200006	M40E-043000RRO	1200023
5	220 mm	M40S-052200ARO	1200007	M40E-052200RRO	1200024
6	220 mm	M40S-062200ARO	1200008	M40E-062200RRO	1200025
7	220 mm	M40S-072200ARO	1200009	M40E-072200RRO	1200026
8	220 mm	M40S-082200ARO	1200010	M40E-082200RRO	1200027

### M4000 Standard, includes end cap with integrated LED

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M40S-025000ARO	1200000	M40E-025020RRO	1200033
	600 mm	M40S-026000ARO	1200001	M40E-026020RRO	1200034
3	220 mm	M40S-032200ARO	1200002	M40E-032220RRO	1207020
	400 mm	M40S-034000ARO	1200003	M40E-034020RRO	1200035
	450 mm	M40S-034500ARO	1200004	M40E-034520RRO	1200036
4	220 mm	M40S-042200ARO	1200005	M40E-042220RRO	1207019
	300 mm	M40S-043000ARO	1200006	M40E-043020RRO	1200037
5	220 mm	M40S-052200ARO	1200007	M40E-052220RRO	_ 1)
6	220 mm	M40S-062200ARO	1200008	M40E-062220RRO	1200121
7	220 mm	M40S-072200ARO	1200009	M40E-072220RRO	1203892
8	220 mm	M40S-082200ARO	1200010	M40E-082200RRO	_ 1)

<sup>1)</sup> When ordering for the first time, please use the information in the "Type" column instead of "Part no."

### M4000 Standard, with integrated alignment aid

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M40S-025010ARO	1200011	M40E-025010RRO	1200028
	600 mm	M40S-026010ARO	1200012	M40E-026010RRO	1200029
3	400 mm	M40S-034010ARO	1200013	M40E-034010RRO	1200030
	450 mm	M40S-034510ARO	1200014	M40E-034510RRO	1200031
4	300 mm	M40S-043010ARO	1200015	M40E-043010RRO	1200032

## M4000 Standard, with integrated alignment aid and end cap with integrated LED

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M40S-025010ARO	1200011	M40E-025030RR0	1200038
	600 mm	M40S-026010ARO	1200012	M40E-026030RR0	1200039
3	400 mm	M40S-034010ARO	1200013	M40E-034030RR0	1200040
	450 mm	M40S-034510ARO	1200014	M40E-034530RR0	1200041
4	300 mm	M40S-043010ARO	1200015	M40E-043030RR0	1200042

## M4000 Standard A/P

Number of beams	Beam separation	Scanning range	Sender/receiver in one housing		Deflector unit	
			Type	Part no.	Type	Part no.
2	500 mm	7.5 m	M40Z-025000RR0	1200120	PSD01-1501 <sup>1)</sup>	1027906
		4.5 m	M40Z-025000TRO	1200122	PSD01-2501 <sup>2)</sup>	1027907
4	300 mm	4.5 m	M40Z-043000TRO	1200123	PSD02-2301 <sup>2)</sup>	1027908

<sup>1)</sup> With mirror deflection (max. effective scanning range 7.5 m)

<sup>2)</sup> With fiber-optic cable deflection (max. effective scanning range 4.5 m)

## M4000 Standard A/P, includes end cap with integrated LED

Number of beams	Beam separation	Scanning range	Sender/receiver in one housing		Deflector unit	
			Type	Part no.	Type	Part no.
2	500 mm	7.5 m	M40Z-025020RR0	1200124	PSD01-1501 <sup>1)</sup>	1027906
		4.5 m	M40Z-025020TRO	1200129	PSD01-2501 <sup>2)</sup>	1027907
4	300 mm	4.5 m	M40Z-043020TRO	1200130	PSD02-2301 <sup>2)</sup>	1027908

<sup>1)</sup> With mirror deflection (max. effective scanning range 7.5 m)

<sup>2)</sup> With fiber-optic cable deflection (max. effective scanning range 4.5 m)

## Options

Description
Integrated interface AS-interface Safety at Work <sup>1)</sup>
Separate connection reset M12 x 5 <sup>1)</sup>

<sup>1)</sup> Options not combinable. Type and part number available upon request or via product finder at [www.mysick.com](http://www.mysick.com)



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### M4000 Standard

#### General data

System part	Sender	Receiver
Number of beams (depending on type)	2 ... 8	
Beam separation (depending on type)	220 mm ... 600 mm	
Scanning range	Configurable	– ✓ 0.5 m ... 20 m 15 m ... 70 m
Response time (depending on type)	–	Max. 12 ms
Protection class	III (EN 50178:1998)	
Enclosure rating	IP 65 (EN 60529)	
Synchronization	Optical, without separate synchronization	
Safety related parameters	Type	Type 4 (IEC 61496)
	Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)
	Category	Category 4 (EN ISO 13849)
	Performance level	PL e (EN ISO 13849)
	PFHd (mean probability of a dangerous failure per hour)	$6.6 \times 10^{-9}$ (EN ISO 13849)
	T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature from ... to	–10 °C ... +55 °C	
Storage temperature from ... to	–25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross section	52 mm x 55.5 mm	
Vibration resistance	5 (10 ... 55), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Housing material	Aluminum alloy ALMGS1 0.5, powder coated	
Front screen material	Polycarbonate, scratch-resistant coating	
Integrated laser alignment aid (depending on type)	≤ 1 mW	
	Laser class	2 (IEC 60825-1:2007) <sup>1)</sup>
	Light sender/type of light	Laser (visible red light)
	Wave length	630 nm ... 680 nm

<sup>1)</sup> Do not stare into beam!

## Functional data

System part	Sender	Receiver
Integrated Interface AS-interface Safety at Work (optional)		✓
Restart interlock	-	✓
Restart interlock (delivery status)	-	Activated
External device monitoring	-	✓
External device monitoring (delivery status)	-	Activated
Beam coding		✓
Beam coding (delivery status)		Non-coded
Configurable application diagnostic output	-	✓
Application diagnostic output (delivery status)	-	Contamination (OWS)
Sender test	✓	-
Sender test (delivery status)	Deactivated	-
Configurable scanning range	-	✓
Scanning range (delivery status)	-	20 m
Integrated laser alignment aid (optional) (depending on type)		- / ✓
End cap with integrated LED (optional) (depending on type)	-	- / ✓
Configuration method	Configuration buttons	

## Electrical data

System part	Sender	Receiver
System connection	M12 x 8 plug	
Connecting cable length	Max. 15 m <sup>1)</sup>	
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC)	
Residual ripple	± 10 %	
Power consumption	Max. 0.2 A	Max. 0.6 A
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored <sup>2)</sup>
Switching voltage HIGH	-	24 V DC ( $V_s - 2.25 V \dots V_s$ )
Switching voltage LOW	-	2 V DC
Switching current	-	0 mA ... 500 mA
Application diagnostic output		
Switching voltage HIGH	-	PNP semiconductor, short-circuit protected 24 V DC ( $V_s - 4.2 V \dots V_s$ )
Switching voltage LOW	-	High resistance
Switching current	-	0 mA ... 100 mA
Display elements	LED/7-segment	

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> Applies to a voltage range between -30 V and +30 V.



## M4000 Standard A/P

## General data

System part	Sender/receiver in one housing	Deflector unit
Number of beams (depending on type)	2 / 4	
Beam separation (depending on type)	300 mm / 500 mm	
Scanning range		
Configurable	✓	-
Beam separation 300 mm	0.5 m ... 4.5 m	4.5 m
Beam separation 500 mm (depending on type)	0.5 m ... 7.5 m / 0.5 m ... 4.5 m	7.5 m / 4.5 m
Response time	Max. 10 ms	-
Protection class	III (EN 50178:1998)	-
Enclosure rating	IP 65 (EN 60529)	-
Synchronization	Optical, without separate synchronization	-
Safety related parameters		
Type	Type 4 (IEC 61496)	-
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	-
Category	Category 4 (EN ISO 13849)	-
Performance level	PL e (EN ISO 13849)	-
PFHd (mean probability of a dangerous failure per hour)	$6.6 \times 10^{-9}$ (EN ISO 13849)	-
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	-
Ambient operating temperature from ... to	-10 °C ... +55 °C	-
Storage temperature from ... to	-25 °C ... +70 °C	-
Air humidity from ... to	15 % ... 95 %, non-condensing	-
Housing cross section	52 mm x 55.5 mm	
Vibration resistance	5 (10 ... 55), IEC 60068-2-6	-
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	-
Housing material	Aluminum alloy ALMGSI 0.5, powder coated	-
Front screen material	Polycarbonate, scratch-resistant coating	-

## Functional data

System part	Sender/receiver in one housing	Deflector unit
Integrated interface AS-interface Safety at Work (optional)	✓	-
Restart interlock	✓	-
Restart interlock (delivery status)	Internal	-
External device monitoring	✓	-
External device monitoring (delivery status)	Activated	-
Beam coding	✓	-
Beam coding (delivery status)	Non-coded	-
Configurable application diagnostic output	✓	-
Application diagnostic output (delivery status)	Contamination (OWS)	-
Configurable scanning range	✓	-
Scanning range (delivery status) (depending on type)	7.5 m / 4.5 m	-
End cap with integrated LED (optional) (depending on type)	- / ✓	-
Configuration method	Configuration buttons	-

## Electrical data

System part	Sender/receiver in one housing	Deflector unit
System connection	M12 x 8 plug	-
Connecting cable length	Max. 15 m <sup>1)</sup>	-
Connecting cable wire cross-section	0.25 mm <sup>2</sup>	-
Supply voltage $V_S$	24 V DC (19.2 V DC ... 28.8 V DC)	-
Residual ripple	± 10 %	-
Power consumption	Max. 0.6 A	-
Safety outputs (OSSD)		
Type of output	2 PNP semiconductors, short-circuit protected, cross-circuit monitored <sup>2)</sup>	-
Switching voltage HIGH	24 V DC ( $V_S - 2.25 \text{ V} \dots V_S$ )	-
Switching voltage LOW	2 V DC	-
Switching current	0 mA ... 500 mA	-
Application diagnostic output	PNP semiconductor, short-circuit protected	
Switching voltage HIGH	24 V DC ( $V_S - 4.2 \text{ V} \dots V_S$ )	-
Switching voltage LOW	High resistance	-
Switching current	0 mA ... 100 mA	-
Display elements	LED/7-segment	-

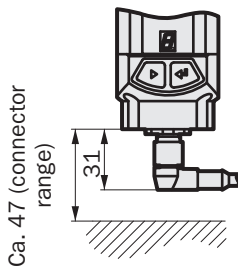
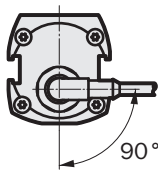
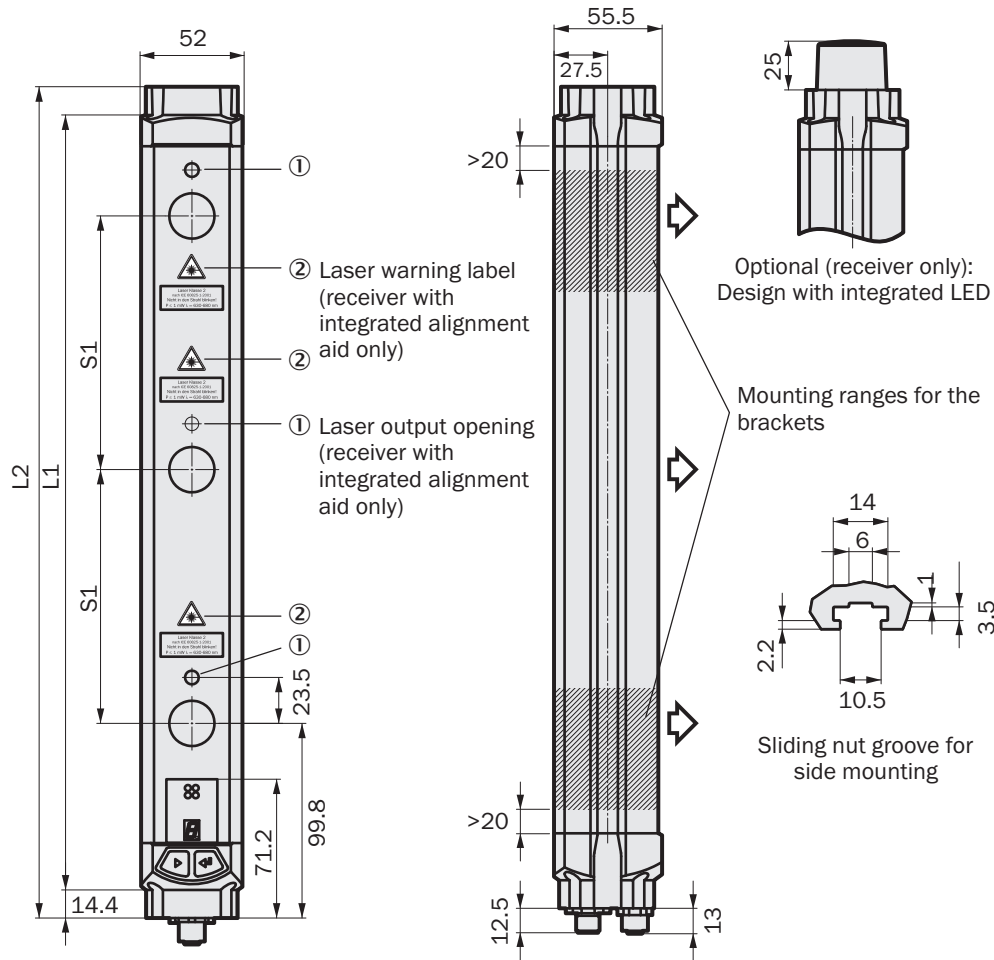
<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

<sup>2)</sup> Applies to a voltage range between -30 V and +30 V.

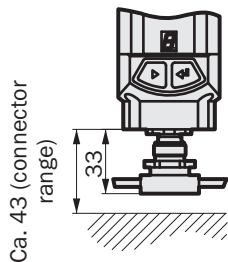


# Dimensional drawings

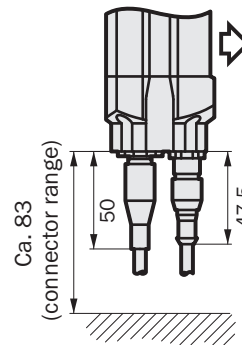
## M4000 Standard, M4000 Standard A/P



Cable socket M12 angled (only with AS-Interface: aligned)



AS-Interface clip M12 (aligned)



Cable socket M12 with cable (left) and cable plug M12 with cable (right, optional, only on receiver)

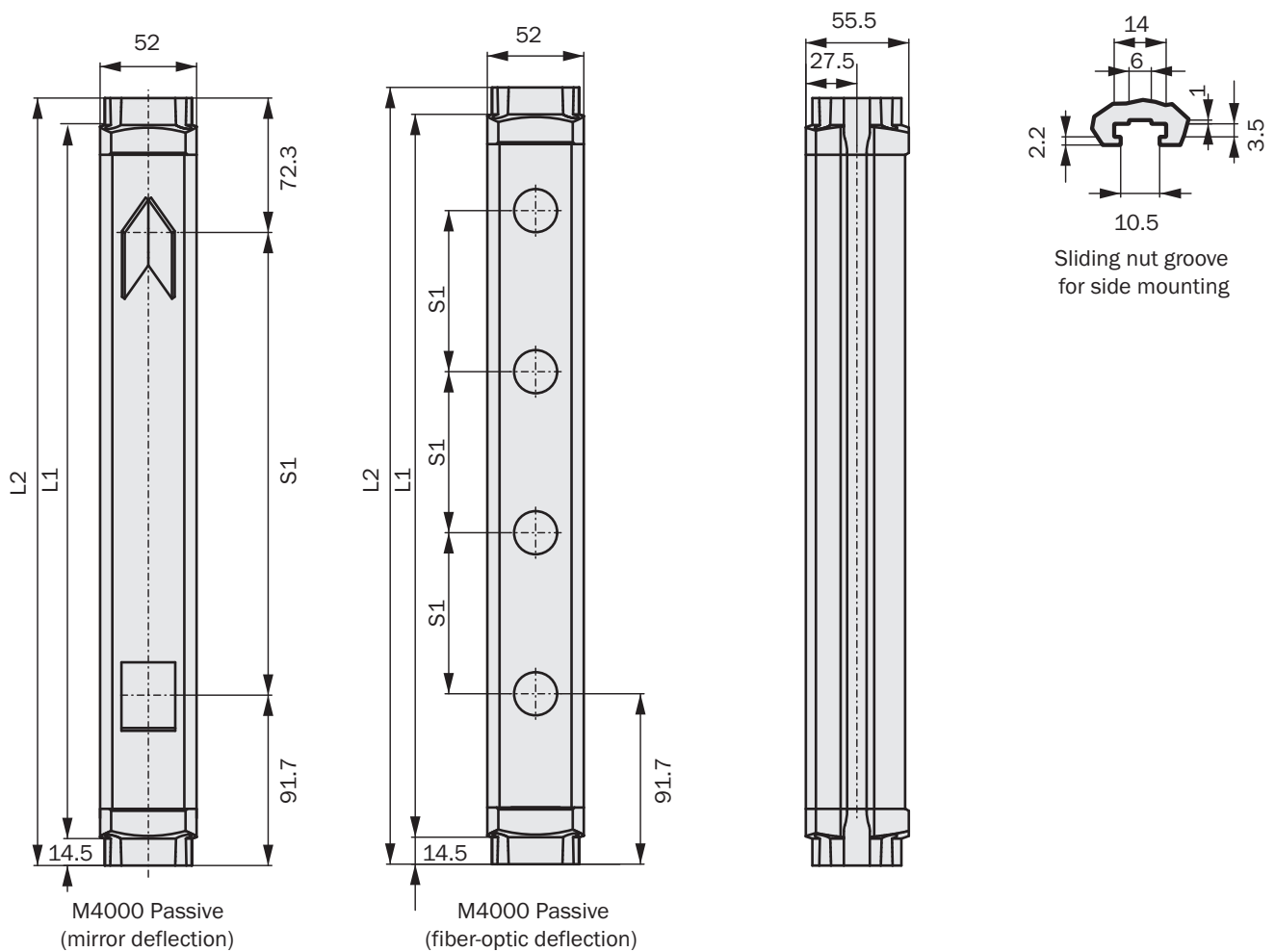
Dimensions in mm





Number of beams	Beam separation S1	L1	L2
2	500	643	672
2	600	743	772
3	220	583	612
3	400	943	972
3	450	1043	1072
4	220	803	832
4	300	1043	1072
5	220	1023	1052
6		1243	1272
7		1462	1491
8		1682	1711

Deflector units for M4000 Standard A/P



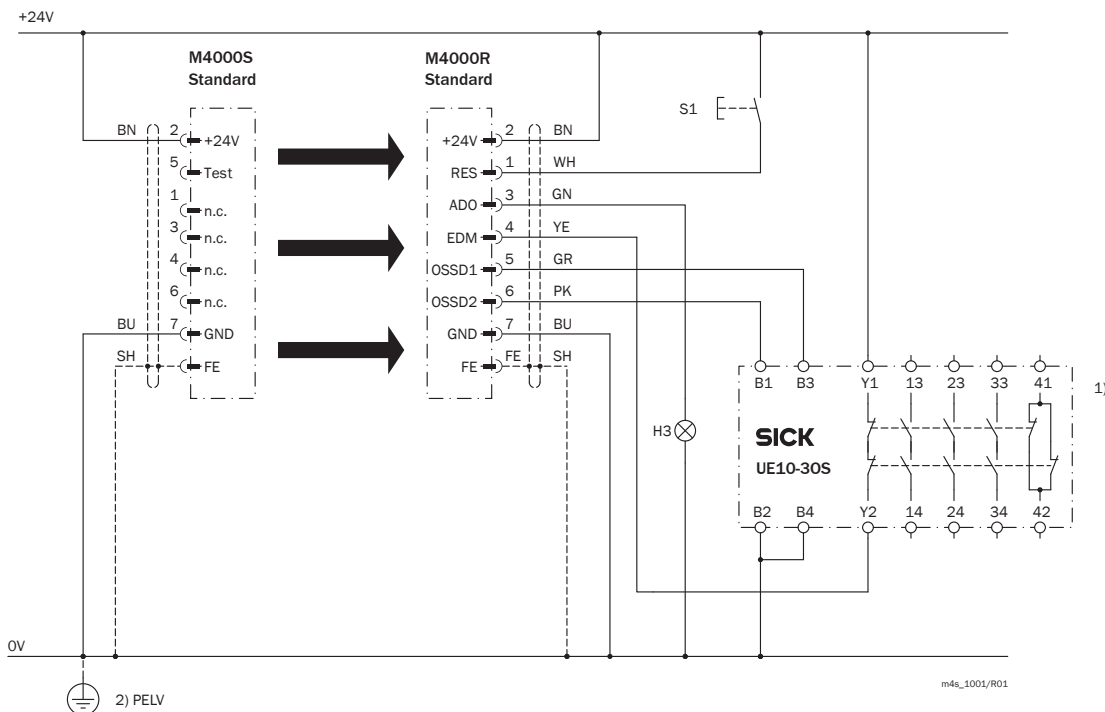
Number of beams	Beam separation S1	L1	L2
2	500	643	672
4	300	1043	1072

Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### M4000 Standard connected to UE10-30S safety relay



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#### Task

Connection of an M4000 Standard multiple light beam safety device to a UE10-30S safety relay.  
Operating mode: with restart interlock and external device monitoring.

#### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the yellow LED on the receiver and the H3 lamp flash. The system is ready for switch-on and waits for an input signal/switch-on signal. The system is enabled by pressing and releasing the S1 button. The OSSD1 and OSSD2 outputs are live, the UE10-30S is switched on. On interruption of one or several of the light beams, the UE10-30S is de-energized by the OSSD1 and OSSD2 outputs.

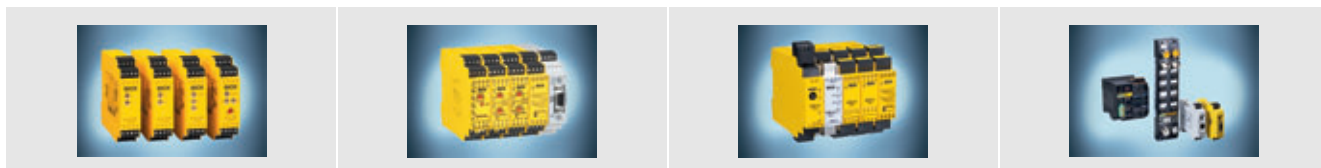
#### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of the UE10-30S will be detected. The shutdown function is retained. On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits.

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel insertion in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
- 2) PELV in accordance with the requirements in EN 60204-1 / 6.4  
Take note of the operating instructions of the integrated devices.






## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 12, swivel mount	4	BEF-2SMGEAKU4	2030510
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMGEAAL4	2044846


### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550
	Sliding nuts for deflector mirror	Suitable for PNS75 and PNS125	6	2030600


### Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Socket M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872


### Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	M12 x 8	Straight	DOS-1208-G	6028422


### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


## Device columns with external grooves

Figure	Description	Max. installation length	Number of beams	Beam separation	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	2	500 mm	PU3H96-00000000	2045490
		1165 mm	3	400 mm	PU3H11-00000000	2045641
		1265 mm	4	300 mm	PU3H13-00000000	2045642
		1720 mm	-	-	PU3H17-00000000	2045643
		2020 mm	-	-	PU3H21-00000000	2045644
		2250 mm	-	-	PU3H22-00000000	2045645
		2400 mm	-	-	PU3H24-00000000	2045646

## Device columns for outdoor use

Figure	Description	Number of beams	Beam separation	Suitable for	Type	Part no.
	With front screen heating, 220 V, including brackets and cable socket (without multiple light beam safety device)	2	500 mm	M40x-0250x0xx0, M40Z-025000xR0, M40x-0250x3xx0, M40Z-025003xx0	PUM12-S02	2019654
		3	400 mm	M40x-0340x0xx0, M40x-0340x3xx0	PUM12-S01	2020800

## Mirror columns with separate mirrors





Figure	Column height	Suitable for	Remark	Type	Part no.
 <small>Product may differ from illustration</small>	985 mm	M40x-0250xxxx, M20x-02x05xxxx	Completely mounted, including mirrors	PM3S96-00240020	1040619
		M40x-0260xxxx		PM3S96-00230060	1040620
	1185 mm	M40x-0340xxxx, M20x-03x40x1xx		PM3S11-00330030	1040625
	1285 mm	M40x-0345xxxx		PM3S13-00330050	1040624
		M40x-0430xxxx, M20x-04x30xxxx		PM3S13-00430040	1040626

## Mirror columns with protective field height mirror


Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0


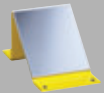
## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMGEAAL2	2045736
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938



## Additional front screen

Figure	Suitable for	Remark	Packing unit	Part no.
 Example of use	M40x-0250xxxx	Including sliding nuts and fixing screws	2	2033225
	M40x-0260xxxx			2033226
	M40x-0322xxxx			2033227
	M40x-0340xxxx			2033228
	M40x-0345xxxx			2033229
	M40x-0422xxxx			2033230
	M40x-0522xxxx			2033231
	M40x-0622xxxx			2033232
	M40x-0722xxxx			2033233
	M40x-0822xxxx			2033234

## Deflector mirrors

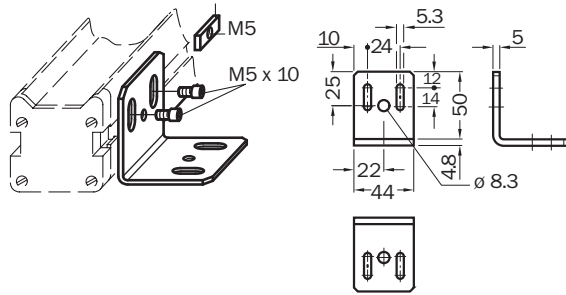
Figure	Mirror surface	Remark	Type	Part no.
	75 mm x 80 mm	Including mounting adapter (two swivel mounts)	PNS75-008	1026647
	80 mm x 97 mm	For 90° deflection, incl. mounting set; not suitable for column mounting	PSK45	5306053

## Laser alignment aid

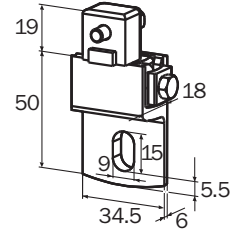
Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter AR60 for M4000	-	-	-	4040006
	Alignment template, for M4000 with integrated laser	-	-	-	4040263

Dimensional drawings mounting systems

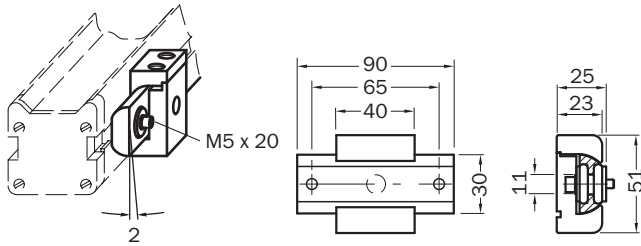
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



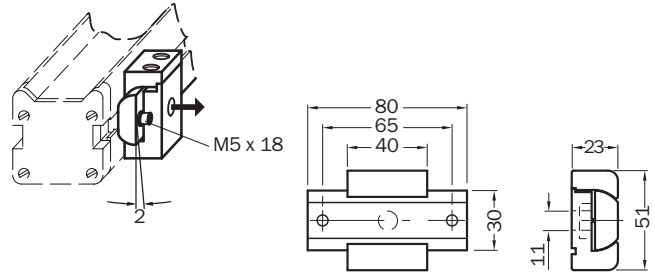
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



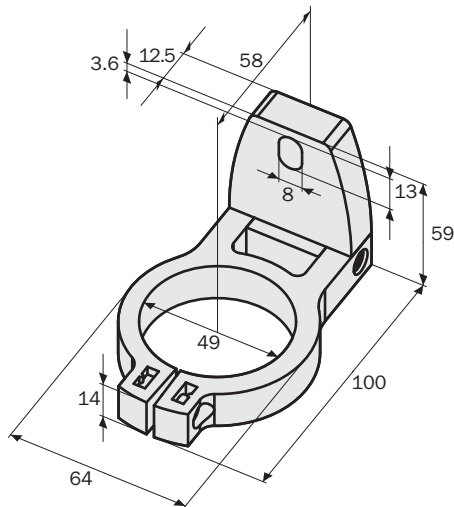
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



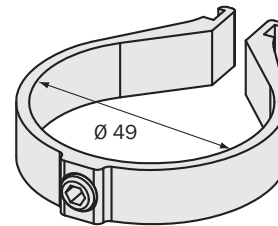
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



**BEF-2SMGEAKU4**  
Mounting kit 12, swivel mount



**BEF-2SMGEAAL4**  
Omega bracket, flexible and quick installation with only one screw



Dimensions in mm

G

## Technical data overview

Scanning range (depending on type)	0.5 m ... 19 m / 0.5 m ... 70 m
Length of the monitored area (depending on type)	300 mm ... 1800 mm
Resolution (depending on type)	60 mm / 80 mm
Type	Type 4 (IEC 61496)
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Enclosure rating	IP 65

## Product description

The M4000 Area multiple light beam safety device is the efficient solution for area protection or for preventing employees standing behind the point-of-operation protection. Area protection can be achieved with maximum availability thanks to its long range and integrated functions, easily con-

figured by PC via the RS-232 interface. The integrated functions, status and diagnostic information permit rapid commissioning and prevent unnecessary machine downtime.

The integrated EFI interface allows the use of additional sensor functions (see A-8).

## In-system added value

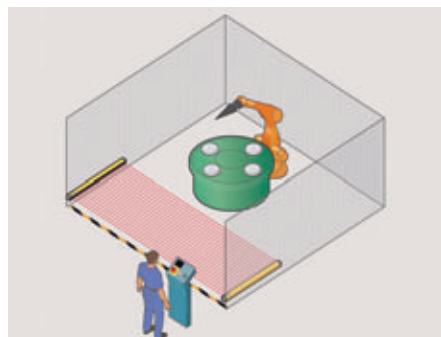
Combined with SICK safe control solutions

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

Provides area protection or point-of-operation guarding of a hazardous point, e.g., on robots, machining centers in mechanical



Hazardous area protection with M4000 Area on a robot

engineering applications or on paper roll machines.



Point-of-operation guarding with M4000 Area at an output conveyor in the automotive industry



- 60 or 80 mm resolution
- Restart interlock (RES)
- External device monitoring (EDM)
- Beam coding
- LED/7-segment display
- Application diagnostic output (ADO)
- Configuration and diagnostics via PC
- SDL interface



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Further information	Page
→ Ordering information	G-36
→ Technical specifications	G-37
→ Dimensional drawings	G-11
→ Connection diagrams	G-40
→ Accessories	G-41
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### M4000 Area

Resolution	Length of the monitored area	Sender		Receiver	
		Type	Part no.	Type	Part no.
60 mm	300 mm	M40S-60A005AA0	1200915	M40E-60A005RA0	1200916
	450 mm	M40S-61A005AA0	1200138	M40E-61A005RA0	1200137
	600 mm	M40S-60A005AA0	1201067	M40E-62A005RA0	1201068
	750 mm	M40S-63A005AA0	1200674	M40E-63A005RA0	1200914
	900 mm	M40S-64A005AA0	1200506	M40E-64A005RA0	1200508
	1050 mm	M40S-65A005AA0	1200507	M40E-65A005RA0	1200509
	1200 mm	M40S-66A005AA0	1200805	M40E-66A005RA0	1200806
	1350 mm	M40S-67A005AA0	1200837	M40E-67A005RA0	1200838
	1500 mm	M40S-68A005AA0	1200850	M40E-68A005RA0	1200849
	1650 mm	M40S-60A005AA0	1200912	M40E-69A005RA0	1200913
	1800 mm	M40S-70A005AA0	1200147	M40E-70A005RA0	1200146
80 mm	300 mm	M40S-60A105AA0	1207202	M40E-60A105RA0	1207203
	450 mm	M40S-61A105AA0	1207205	M40E-61A105RA0	1207204
	600 mm	M40S-62A105AA0	1200139	M40E-62A105RA0	1200140
	750 mm	M40S-63A105AA0	1200134	M40E-63A105RA0	1200685
	900 mm	M40S-64A105AA0	1201655	M40E-64A105RA0	1201656
	1050 mm	M40S-65A105AA0	1200586	M40E-65A105RA0	1200587
	1200 mm	M40S-66A105AA0	1201046	M40E-66A105RA0	1201045
	1350 mm	M40S-67A105AA0	1200604	M40E-67A105RA0	1200605
	1500 mm	M40S-68A105AA0	1200588	M40E-68A105RA0	1200589
	1650 mm	M40S-69A105AA0	1200686	M40E-69A105RA0	1200687
	1800 mm	M40S-70A105AA0	1200149	M40E-70A105RA0	1200148

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Resolution (depending on type)	60 mm / 80 mm	
Length of the monitored area (depending on type)	300 mm ... 1800 mm	
Scanning range		
Configurable	-	✓
Resolution 60 mm	-	0.5 m ... 6 m / 5 m ... 19 m
Resolution 80 mm	-	0.5 m ... 20 m / 15 m ... 70 m
Response time	-	Max. 17 ms
Protection class	III (EN 50178:1998)	
Enclosure rating	IP 65 (EN 60529)	
Synchronization	Optical, without separate synchronization	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	1.4 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature from ... to	-10 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Housing cross section	52 mm x 55.5 mm	
Vibration resistance	5 (10 ... 55), IEC 60068-2-6	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Housing material	Aluminum alloy ALMGSI 0.5, powder coated	
Front screen material	Polycarbonate, scratch-resistant coating	

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## Functional data

System part	Sender	Receiver
Safe device communication via EFI/SDL		✓
Restart interlock	-	✓
Restart interlock (delivery status)	-	Internal
External device monitoring	-	✓
External device monitoring (delivery status)	-	Activated
Beam coding		✓
Beam coding (delivery status)		Non-coded
Configurable application diagnostic output	-	✓
Application diagnostic output (delivery status)	-	Contamination (OWS)
Sender test	✓	-
Sender test (delivery status)	Deactivated	-
Configurable scanning range	-	✓
Scanning range (delivery status) (depending on type)	-	6 m / 20 m
SDL interface		✓
Configuration method	PC with CDS (configuration and diagnostic software)	

## Electrical data

System part	Sender	Receiver
System connection	M26 x 11 + FE Hirschmann plug	
Connecting cable length	Max. 50 m <sup>1)</sup>	
Connecting cable wire cross-section	0.75 mm <sup>2</sup>	
Supply voltage V <sub>S</sub>	24 V (19.2 V ... 28.8 V) <sup>2)</sup>	
Residual ripple	± 10 %	
Power consumption	Max. 0.2 A	Max. 0.6 A
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored <sup>3)</sup>
Switching voltage HIGH	-	24 V DC (V <sub>S</sub> - 2.25 V ... V <sub>S</sub> )
Switching voltage LOW	-	2 V DC
Switching current	-	0 mA ... 500 mA
Application diagnostic output		PNP semiconductor, short-circuit protected
Switching voltage HIGH	-	24 V DC (V <sub>S</sub> - 4.2 V ... V <sub>S</sub> )
Switching voltage LOW	-	High resistance
Switching current	-	0 mA ... 100 mA
Display elements	LED/7-segment	

<sup>1)</sup> Depending on load, power supply and wire cross-section. The technical specifications must be observed.

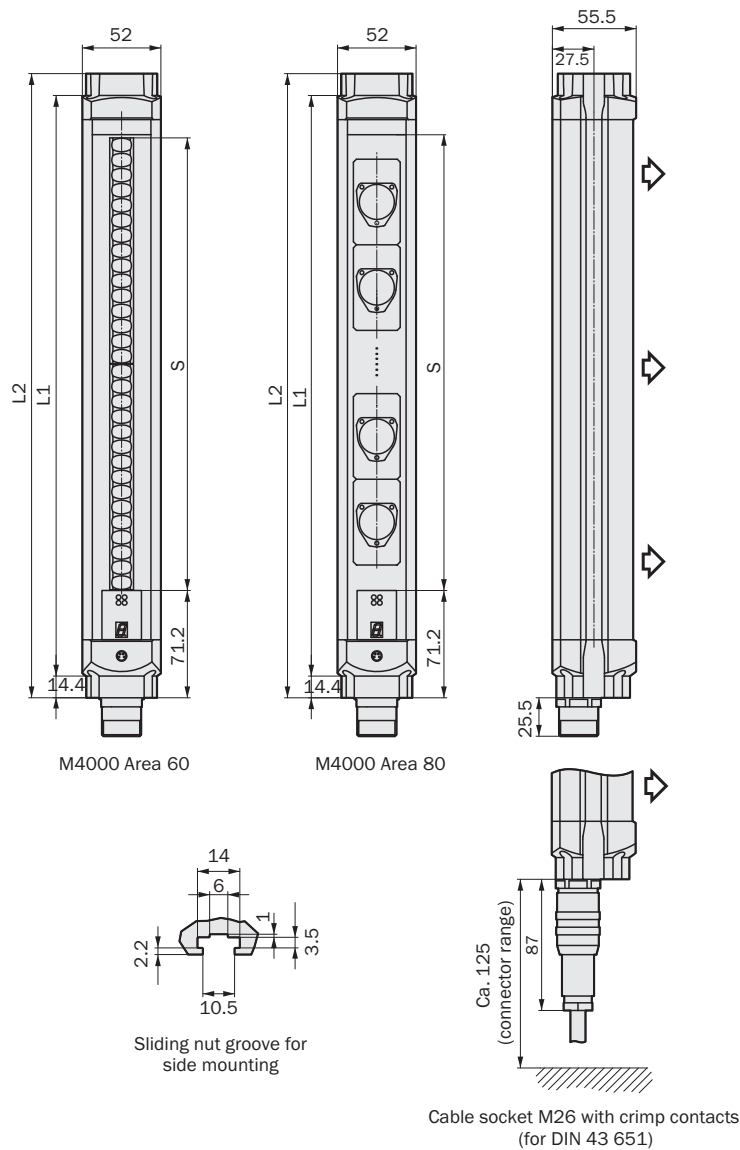
<sup>2)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204.

<sup>3)</sup> Applies to a voltage range between -30 V and +30 V.



# Dimensional drawings

## M4000 Area



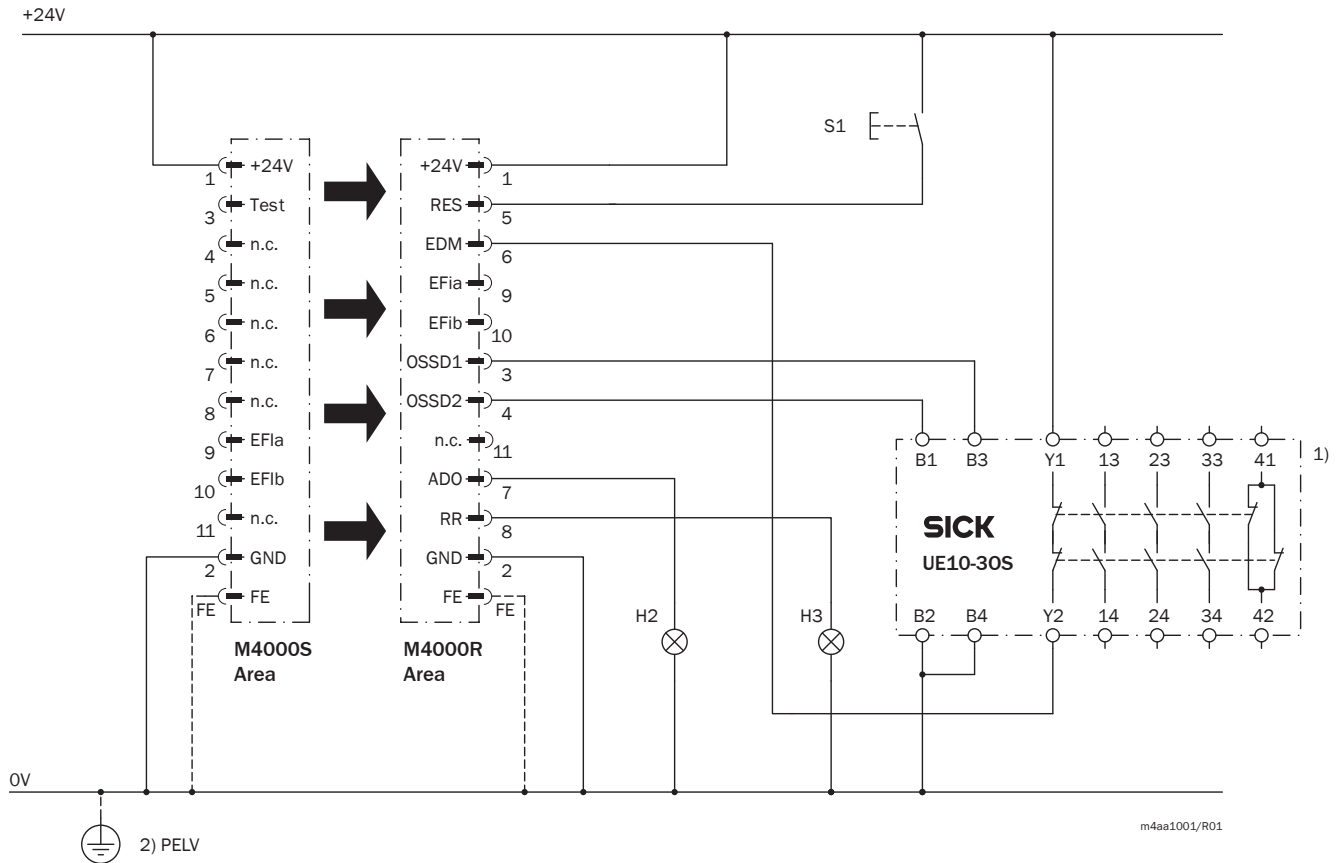
Length of the monitored area S	L1	L2
300	387	416
450	537	566
600	687	716
750	837	866
900	987	1016
1050	1137	1166
1200	1287	1316
1350	1437	1466
1500	1587	1616
1650	1737	1766
1800	1887	1916

Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### M4000 Area connected to UE10-30S safety relay



#### Task

Connection of an M4000 Area multiple light beam safety device to a UE10-30S safety relay.

Operating mode: with restart interlock and external device monitoring.

#### Operating characteristics

When the light path is clear and the UE10-30S is de-energized and functioning correctly, the yellow LED on the receiver and the H3 lamp flash. The system is ready for switch-on and waits for an input signal/switch-on signal. The system is enabled by pressing and releasing the S1 button. The OSSD1 and OSSD2 outputs are live, the UE10-30S is switched on. On interruption of one or several of the light beams, the UE10-30S is de-energized by the OSSD1 and OSSD2 outputs.

If the optics are dirty, H2 indicator illuminates.

#### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The erroneous behavior of the UE10-30S will be detected. The shutdown function is retained. On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits.

#### Comments

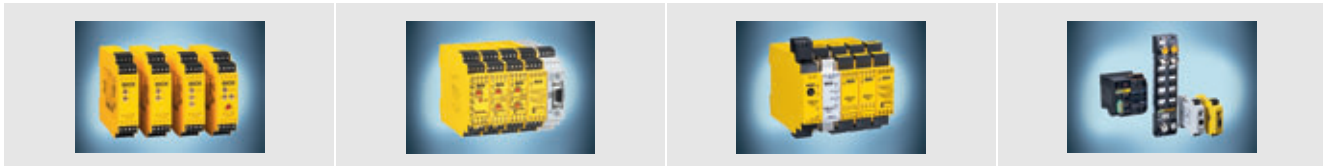
1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, this integration must be dual-channel (x/y paths). Single-channel insertion in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) PELV in accordance with the requirements in EN 60204-1 / 6.4

Take note of the operating instructions of the integrated devices. This applies particularly to the use of configurable functions.

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## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories


### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 12, swivel mount	4	BEF-2SMGEAKU4	2030510
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMGEAAL4	2044846
	Stand, for horizontal mounting of C4000 Fusion, Entry/Exit, and Palletizer safety light curtains and M4000 Area multiple light beam safety devices, for mounting heights from 70 mm to 780 mm	2	BEF-3HHOCAST2	2041661



### Sliding nuts

Figure	Description	Remark	Packing unit	Part no.
	Sliding nuts	Included with delivery	4	2017550

## Connecting cable


Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	DOL-0612G2M5075KM0	2022544
			5 m	DOL-0612G05M075KM0	2022545
			7.5 m	DOL-0612G7M5075KM0	2022546
			10 m	DOL-0612G10M075KM0	2022547
			15 m	DOL-0612G15M075KM0	2022548
			20 m	DOL-0612G20M075KM0	2022549
			30 m	DOL-0612G30M075KM0	2022550

## Cable receptacles


Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758

## G



## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

## Additional front screen

Figure	Suitable for	Remark	Packing unit	Part no.
 Example of use	M40x-60xxxxxx	Including sliding nuts and fixing screws	2	2033235
	M40x-61xxxxxx			2033236
	M40x-62xxxxxx			2033237
	M40x-63xxxxxx			2033238
	M40x-64xxxxxx			2033239
	M40x-65xxxxxx			2033240
	M40x-66xxxxxx			2033241
	M40x-67xxxxxx			2033242
	M40x-68xxxxxx			2033243
	M40x-69xxxxxx			2033244
	M40x-70xxxxxx			2033245


**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter AR60 for M4000	-	-	-	4040006
	Alignment aid, for M4000 with integrated laser	-	-	-	4040263

**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

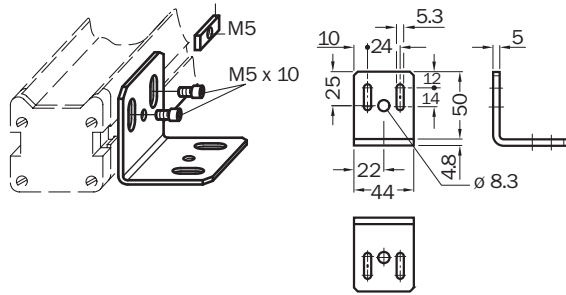
**Configuration tools**

Figure	Description	Type	Part no.
	For saving and transferring configurations. For C4000 Standard, Advanced, Palletizer, Entry/Exit, Fusion and M4000 Advanced, Advanced Curtain, Area	Clone plug for C4000 and M4000	1029665
	-	Wall mount	5318443

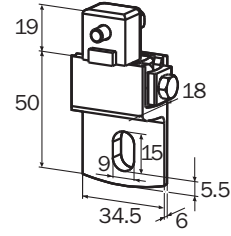
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Dimensional drawings mounting systems

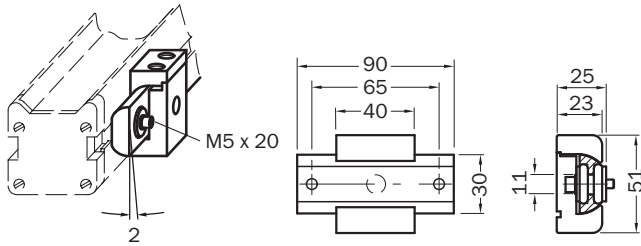
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



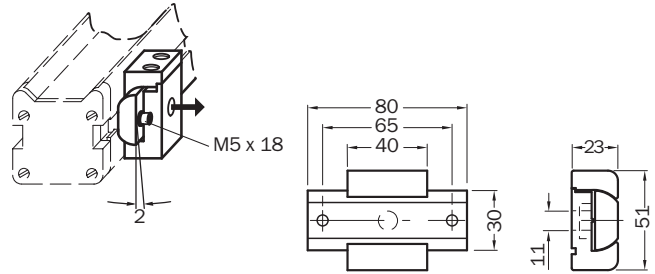
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



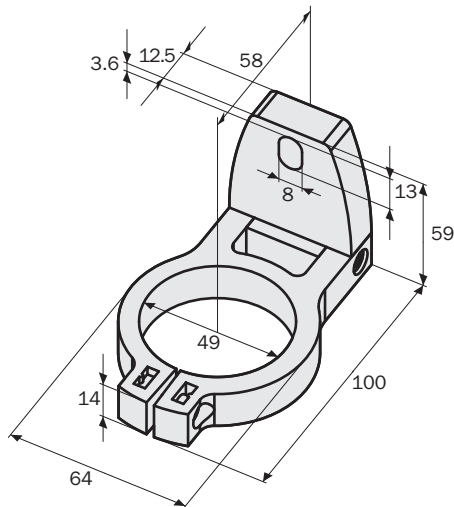
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



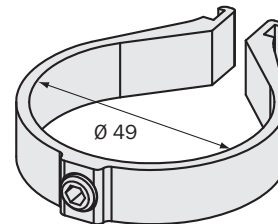
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



**BEF-2SMGEAKU4**  
Mounting kit 12, swivel mount



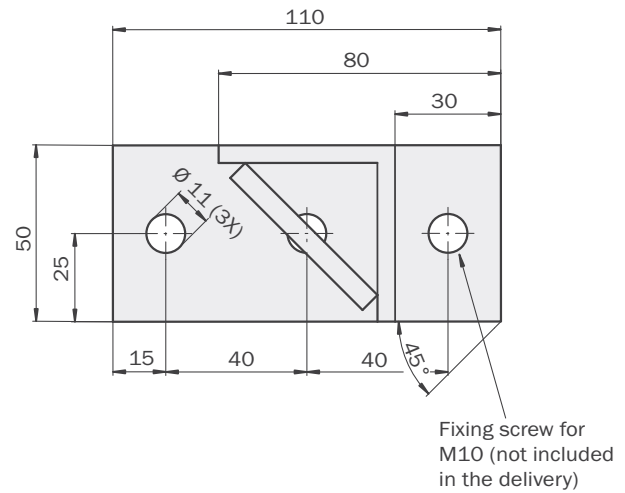
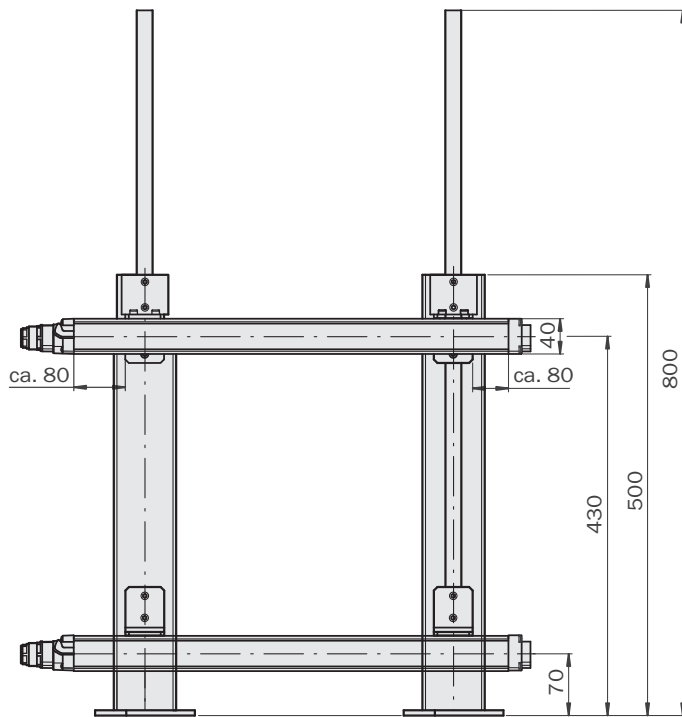
**BEF-2SMGEAAL4**  
Omega bracket, flexible and quick installation with only one screw



Dimensions in mm

G



**BEF-3HHOCAST2**  
Stand for horizontal mounting

Dimensions in mm

G



- External device monitoring (EDM)
- Self-testing
- 7-segment display
- Diagnostics
- Alignment aid
- Beam coding



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## Technical data overview

Scanning range (depending on type)	0 m ... 25 m / 0 m ... 70 m
Number of beams (depending on type)	2 ... 9
Beam separation or resolution (depending on type)	116 mm ... 500 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508), SILCL2 (EN 62061)
Enclosure rating	IP 65

## Product description

With its high signal reserve, the M2000 Standard multi-beam photoelectric safety switch is also reliable under harsh industrial conditions. Functions and status information integrated in the device allow rapid commissioning and prevent unnecessary machine downtime. The modular concept

cost-effectively achieves maximum machine safety by precisely coordinating the characteristics of the device to the users' requirements. Interfaces and service concepts complete the product range to provide an ideal solution for the application.

## In-system added value

Combined with SICK safe control solutions

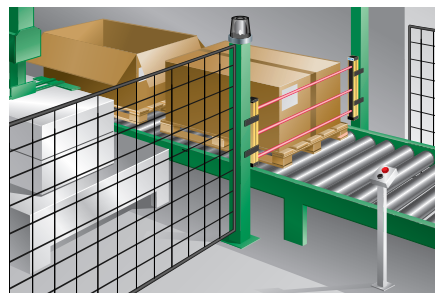
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	O-2
Flexi Soft	✓	✓	✓	O-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52

→ For more combinations, see annex

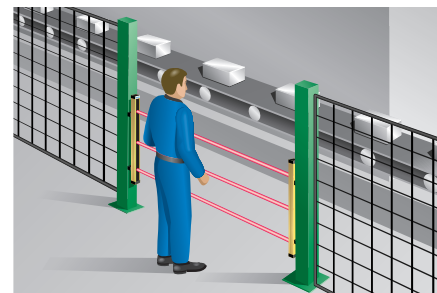
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Storage and conveyor
- Wood industry
- Textile industry
- Stone production
- Electronics industry
- Packaging industry



Packaging industry: M2000 Standard with Flexi Classic on a packaging machine



Storage and conveyor: M2000 on a conveyor belt system

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→ Dimensional drawings	G-50
→ Connection diagrams	G-51
→ Accessories	G-52
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### M2000 Standard

Usage	As a standalone system
-------	------------------------

### Scanning range 0 m ... 25 m

Number of beams	Beam separation or resolution	System connection	External device monitoring	Sender		Receiver	
				Type	Part no.	Type	Part no.
2	500 mm	6-pin + PE Hirschmann plug	–	M20S-02150A120	1016405	M20E-02150A120	1016421
		M12 x 8 plug	✓	M20S-02150A122	1018186	M20E-02150A122	1018187
3	400 mm	6-pin + PE Hirschmann plug	–	M20S-03140A120	1016428	M20E-03140A120	1016429
		M12 x 8 plug	✓	M20S-03140A122	1018188	M20E-03140A122	1018189
4	300 mm	6-pin + PE Hirschmann plug	–	M20S-04130A120	1016509	M20E-04130A120	1016510
		M12 x 8 plug	✓	M20S-04130A122	1018190	M20E-04130A122	1018191
6	170 mm	6-pin + PE Hirschmann plug	–	M20S-061A3A120	1016446	M20E-061A3A120	1016447
		M12 x 8 plug	✓	M20S-061A3A122	1018192	M20E-061A3A122	1018193
7	170 mm	6-pin + PE Hirschmann plug	–	M20S-071A3A120	1016434	M20E-071A3A120	1016435
		M12 x 8 plug	✓	M20S-071A3A122	1018194	M20E-071A3A122	1018195
8	116 mm	6-pin + PE Hirschmann plug	–	M20S-081A2A120	1016438	M20E-081A2A120	1016439
		M12 x 8 plug	✓	M20S-081A2A122	1018196	M20E-081A2A122	1018197
	170 mm	6-pin + PE Hirschmann plug	–	M20S-081A3A120	1016440	M20E-081A3A120	1016441
		M12 x 8 plug	✓	M20S-081A3A122	1018198	M20E-081A3A122	1018199
9	170 mm	6-pin + PE Hirschmann plug	–	M20S-091A3A120	1016442	M20E-091A3A120	1016443
		M12 x 8 plug	✓	M20S-091A3A122	1018200	M20E-091A3A122	1018201



### Scanning range 0 m ... 70 m

Number of beams	Beam separation or resolution	System connection	External device monitoring	Sender		Receiver	
				Type	Part no.	Type	Part no.
2	500 mm	6-pin + PE Hirschmann plug	–	M20S-02250A120	1018172	M20E-02250A120	1018173
		M12 x 8 plug	✓	M20S-02250A122	1018174	M20E-02250A122	1018175
3	400 mm	6-pin + PE Hirschmann plug	–	M20S-03240A120	1018176	M20E-03240A120	1018177
		M12 x 8 plug	✓	M20S-03240A122	1018178	M20E-03240A122	1018179
4	300 mm	6-pin + PE Hirschmann plug	–	M20S-04230A120	1018180	M20E-04230A120	1018181
		M12 x 8 plug	✓	M20S-04230A122	1018182	M20E-04230A122	1018183

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Number of beams (depending on type)	2 ... 9	
Beam separation or resolution (depending on type)	116 mm ... 500 mm	
Scanning range (depending on type)	0 m ... 25 m / 0 m ... 70 m	
Response time	–	Max. 8 ms
Protection class	III	
Enclosure rating	IP 65 (EN 60529)	
Synchronization	Optical, without separate synchronization	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	2.2 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	–25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %	
Housing cross section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	
Shock resistance	10 g, 16 ms (according to IEC 68-2-29)	

<sup>1)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics. For more detailed information on this topic, see page (A-10).

### Functional data

System part	Sender	Receiver
External device monitoring (depending on type)	–	– / ✓
Beam coding		✓
Self-testing		✓

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## Electrical data

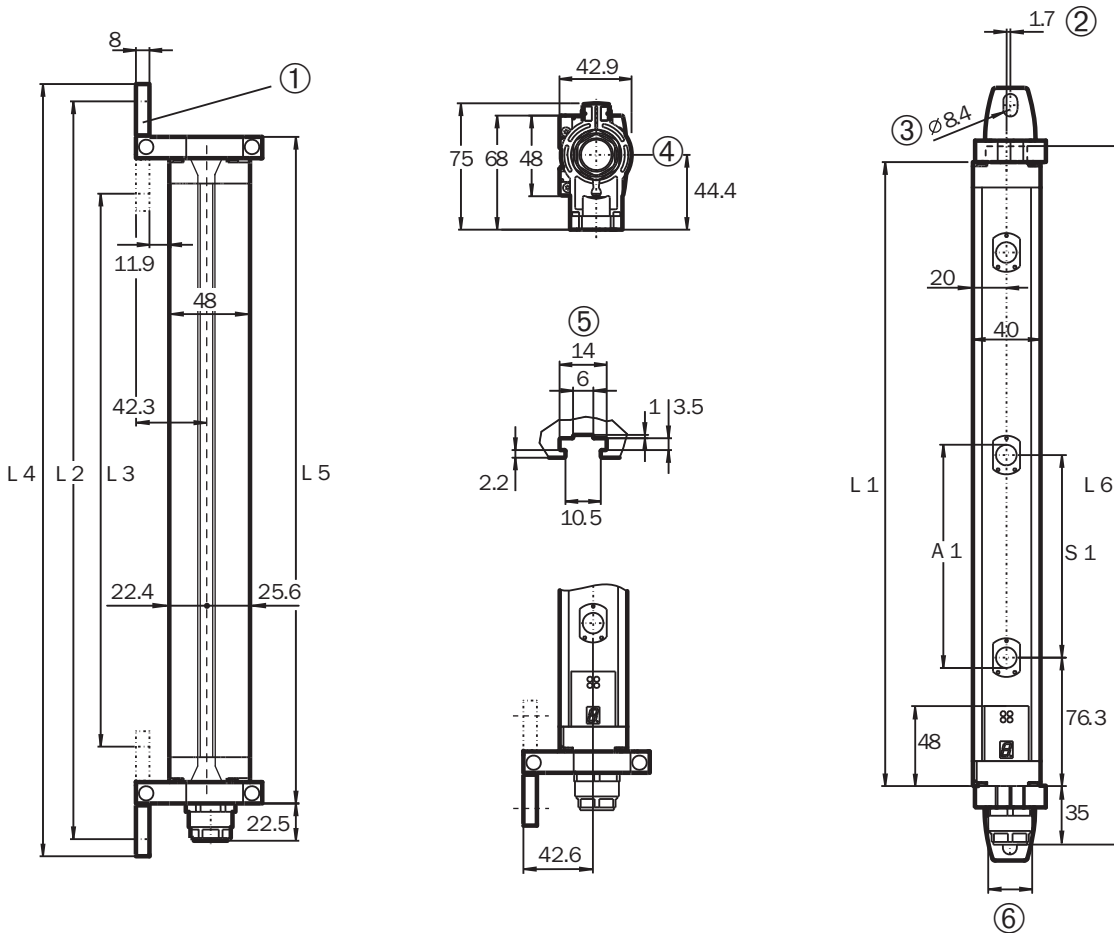
System part	Sender	Receiver
System connection (depending on type)	6-pin + PE Hirschmann plug / M12 x 8 plug	
Connecting cable wire cross-section		
Hirschmann plug	Max. 1 mm <sup>2</sup>	
M12 plug	Max. 0.25 mm <sup>2</sup>	
Connecting cable length		
Wire cross-section 1 mm <sup>2</sup>	Max. 60 m	
Wire cross-section 0.25 mm <sup>2</sup>	Max. 15 m	
Supply voltage V <sub>s</sub>	24 V (19.2 V ... 28.8 V)	
Power consumption	3.7 W	5 W
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	Min. V <sub>S</sub> - 2.25 V
Switching current	-	Max. 500 mA



# Dimensional drawings

→ You can find more dimensional drawings in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## M2000 Standard



Sender unit with swivel mount (receiver unit mirror image)

- ① Mounting clamp
- ② Center of light beam offset
- ③ Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ④ Adjustment
- ⑤ Sliding nut groove for side mounting
- ⑥ Plug PG13.5 according to DIN 43651

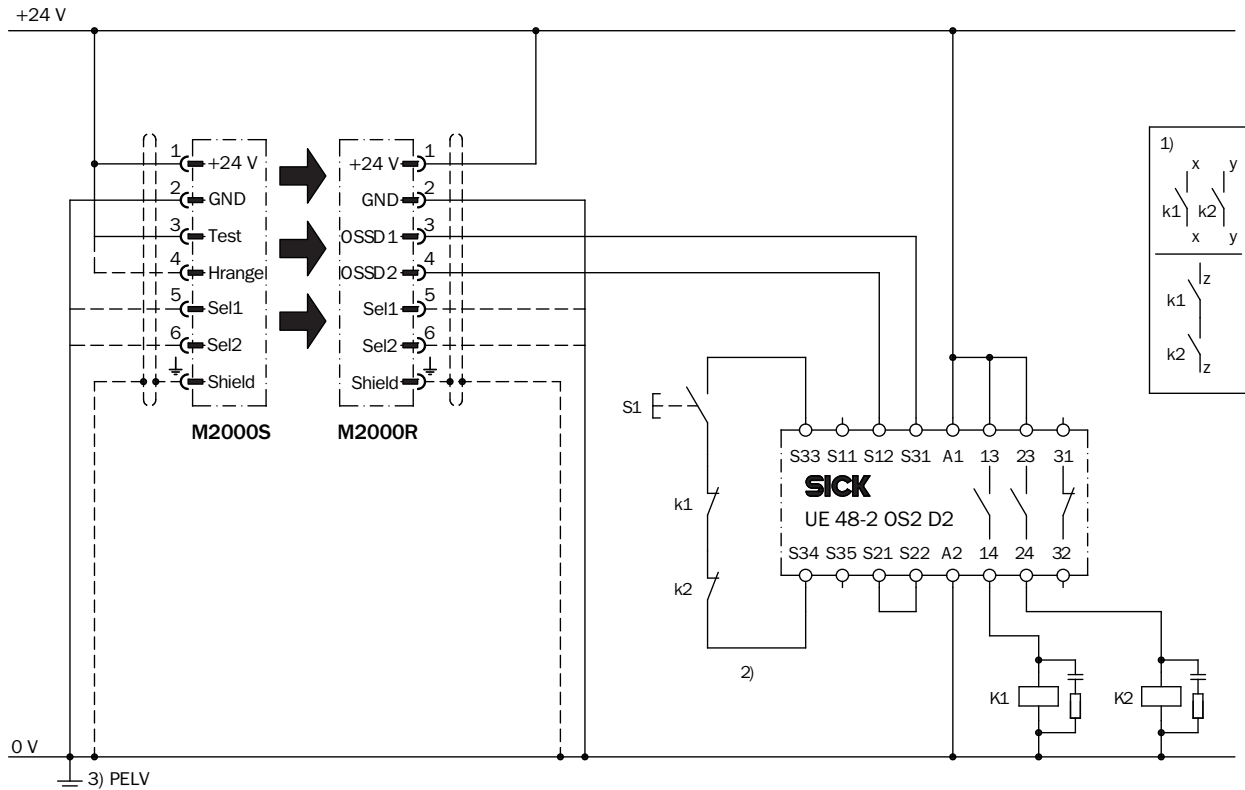
Number of beams	Beam separation	Resolution	L1	L2	L3	L4	L5	L6
2	500	-	630	697	588	718	655	675
3	400	-	931	998	888	1019	956	976
4	300	-	1031	1098	989	1119	1056	1076
8	-	116	851	919	809	939	877	896
6	-	170	916	983	874	1004	941	960
7	-	170	1073	1140	1031	1161	1098	1118
8	-	170	1231	1298	1189	1319	1256	1275
9	-	170	1388	1455	1346	1476	1413	1433

Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### M2000 Standard on UE48-20S safety relay



#### Task

Connection of an M2000 Standard multi-beam photoelectric safety switch to UE48-20S.

Operating mode: with restart interlock and external device monitoring.

#### Function

When the light path is clear, the OSSD1 and OSSD2 outputs are live. The system is ready to switch on if K1 and K2 are de-energized. By pressing S1 (button is pressed and released), the UE48-20S is energized and its 13 - 14 and 23 - 24 contacts activate K1 and K2. On interruption of one of the light beams, the UE48-20S is de-energized by the OSSD1 and OSSD2 outputs and K1 and K2 are deactivated.

#### Fault analysis

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The incorrect functioning of one of the K1 or K2 contactors will be detected and does not result in the loss of the shutdown function. Jamming of the S1 button will prevent the UE48-20S from enabling.

#### Comments

<sup>1)</sup> Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

<sup>2)</sup> The external device monitoring is only static.

<sup>3)</sup> PELV as required in EN 60204-1 / 6.4

The related operating instructions for the integrated devices must be observed.









## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847



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## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
		Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343

## Cable receptacles


Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 6 + FE	Straight	DOS-0607G000GA3KM0	6006612
		Angled	DOS-0607W000IA3KU0	6007363

## Power supply units


Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

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## Device columns with external grooves

Figure	Description	Max. installation length	Number of beams	Beam separation	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	2	500 mm	PU3H96-00000000	2045490
		1165 mm	3	400 mm	PU3H11-00000000	2045641
		1265 mm	4	300 mm	PU3H13-00000000	2045642
		1720 mm	-	-	PU3H17-00000000	2045643
		2020 mm	-	-	PU3H21-00000000	2045644
		2250 mm	-	-	PU3H22-00000000	2045645
		2400 mm	-	-	PU3H24-00000000	2045646

## Device columns for outdoor use

Figure	Description	Number of beams	Beam separation	Suitable for	Type	Part no.
	With front screen heating, 220 V, including brackets and cable socket (without multiple light beam safety device)	2	500 mm	M20x-02x50Axxx	PUG12-S02	2023707
		3	400 mm	M20x-03x40Axxx	PUG12-S01	2025441

## Mirror columns with separate mirrors





Figure	Column height	Suitable for	Remark	Type	Part no.
 <small>Product may differ from illustration</small>	985 mm	M40x-0250xxxxx, M20x-02x05xxxx	Completely mounted, including mirrors	PM3S96-00240020	1040619
	1185 mm	M40x-0340xxxxx, M20x-03x40x1xx		PM3S11-00330030	1040625
	1285 mm	M40x-0430xxxxx, M20x-04x30xxxx		PM3S13-00430040	1040626

## Mirror columns with protective field height mirror



Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0


## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731

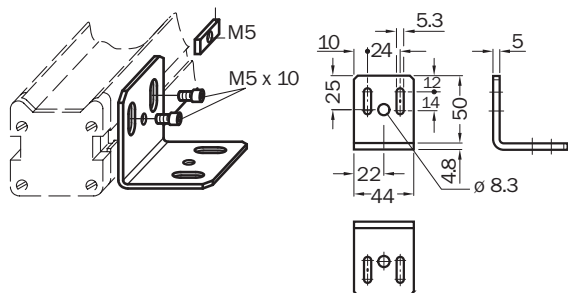
## Configuration tools

Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

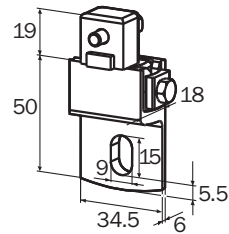
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Dimensional drawings mounting systems

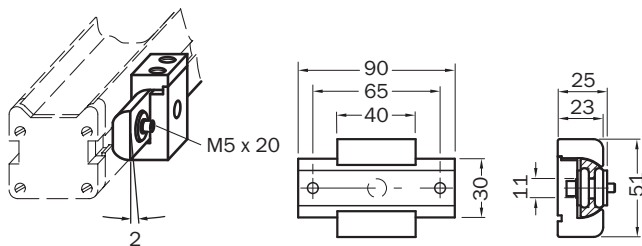
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



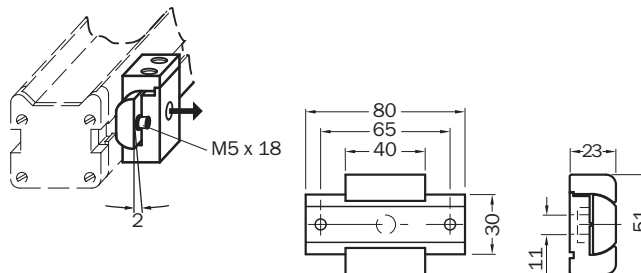
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



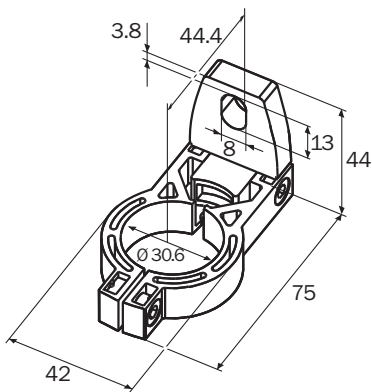
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



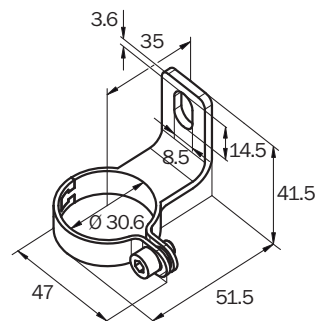
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



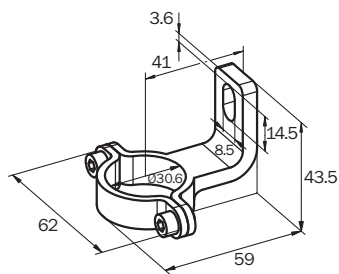
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



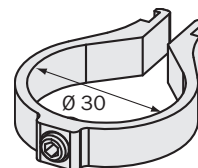
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2SMMEAAL2**  
Omega bracket, mounting kit for device columns



Dimensions in mm

## Technical data overview

Resistant materials	Stainless steel, PMMA, PA 6
Scanning range	0 m ... 19 m
Number of beams (depending on type)	2 / 3 / 4
Beam separation (depending on type)	300 mm / 400 mm / 500 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508), SILCL2 (EN 62061)
Enclosure rating	IP 69K, IP 67, IP 66, IP 65

## Product description

The IP69K housing, in conjunction with the M2000 multi-beam photoelectric safety switch, achieves an IP 69K enclosure rating. The materials used (V4A, PMMA, PA, PVC) have a high level of resistance against

common cleaning agents. A compensating element (membrane) prevents condensation on the plastic tubes and the entry of liquids. The cable is fed into the device through the proven PG connector.

## In-system added value

Combined with SICK safe control solutions

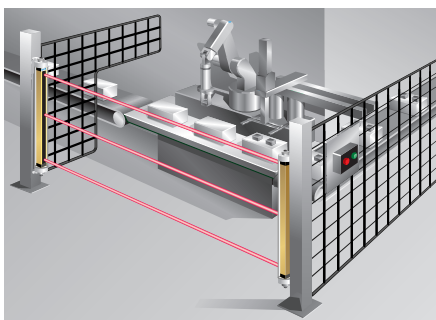
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Packaging industry
- Food industry
- Chemical industry
- Pharmaceutical industry
- Clean-room systems



Access protection on a processing center in the hygiene area



- IP 69K, IP 67 and IP 66 enclosure ratings
- Withstands wash down pressure up to 100 bar
- Water temperature resistant up to 80 °C
- ECOLAB and Diversey cleaning certificates
- Chemical-resistant materials: stainless steel end caps and brackets, PMMA tube, PA membrane



Further information	Page
→ Ordering information	G-58
→ Technical specifications	G-58
→ Dimensional drawings	G-60
→ Connection diagrams	G-61
→ Accessories	G-61
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### IP69K Housing with integrated sender or receiver unit M2000, incl. PVC cable

Usage	As a standalone system
-------	------------------------

### Scanning range 0 m ... 19 m

Number of beams	Beam separation	Sender		Receiver	
		Type	Part no.	Type	Part no.
2	500 mm	M25S-02150C112	1024208	M25E-02150C112	1024209
3	400 mm	M25S-03140C112	1024210	M25E-03140C112	1024211
4	300 mm	M25S-04130C112	1024212	M25E-04130C112	1024213

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Number of beams (depending on type)	2 / 3 / 4	
Beam separation (depending on type)	500 mm / 400 mm / 300 mm	
Scanning range	0 m ... 19 m	
Response time	-	Max. 8 ms
Protection class	III	
Enclosure rating	IP 69K IP 66	
Synchronization	Optical, without separate synchronization	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	2.2 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Materials		
End caps	Stainless steel	
Plastic tube	PMMA	
Compensating element (membrane)	PA 6	
PG connector	PA 6	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	

<sup>1)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics. For more detailed information on this topic, see page (A-10).

## Functional data

System part	Sender	Receiver
External device monitoring (depending on type)	-	- / ✓
Beam coding		✓
Self-testing		✓

## Electrical data

System part	Sender	Receiver
System connection	PVC cable, 15 m	
Supply voltage $V_S$	24 V (19.2 V ... 28.8 V)	
Power consumption	3.7 W	5 W
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	Min. $V_S - 2.25$ V
Switching current	-	Max. 500 mA



## Dimensional drawings

### M2000 Standard in IP69K Housing

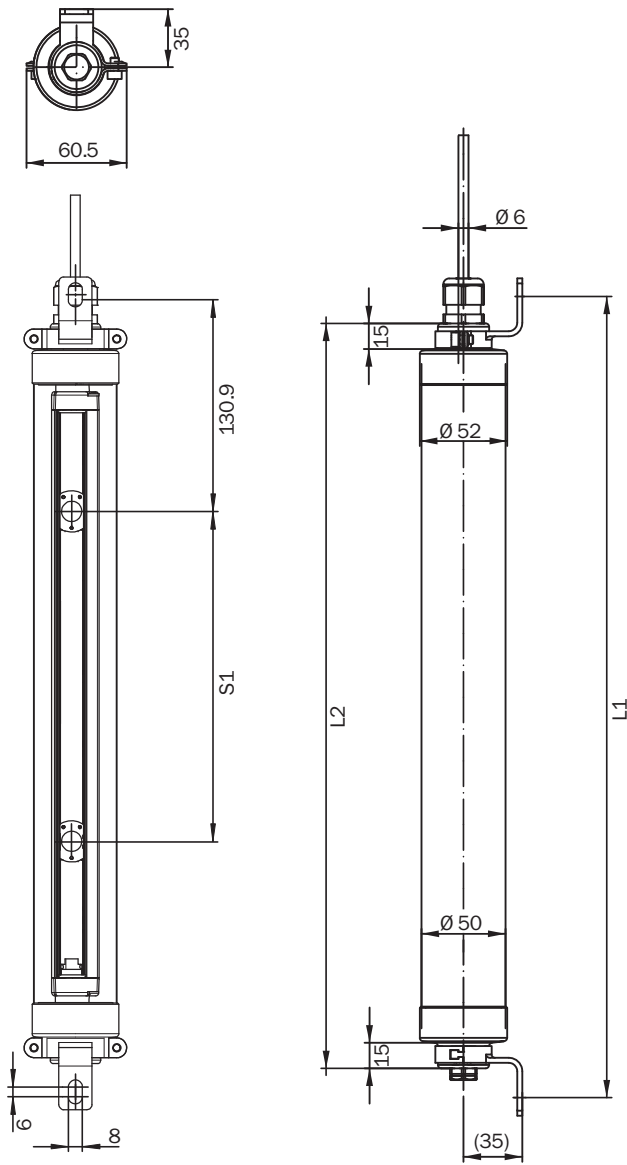


Illustration with stainless steel bracket (not supplied with delivery)

Number of beams	Beam separation	L1	L2
2	500	777	744
3	400	1078	1045
4	300	1228	1195

Dimensions in mm



## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)



## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories

### Mounting systems

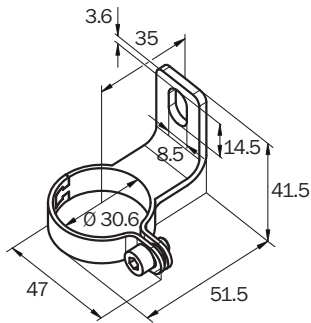
Figure	Property	Packing unit	Type	Part no.
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Stainless steel support bracket	2	BEF-2AAAADES2	2026849
	For M12 cable socket	–	Assembly key	4034690
	–	–	Venting membrane	5309082

### Power supply units

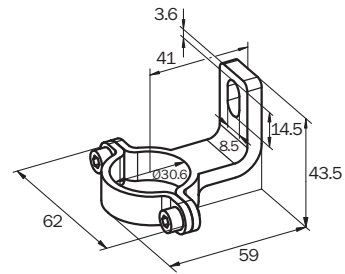
Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790

Dimensional drawings mounting systems

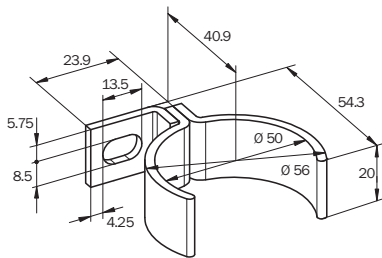
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2AAAADES2**  
Stainless steel support bracket



Dimensions in mm



## Technical data overview

Scanning range (depending on type)	0 m ... 25 m / 0 m ... 70 m
Number of beams (depending on type)	2 ... 9
Beam separation or resolution (depending on type)	116 mm ... 500 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508), SILCL2 (EN 62061)
Enclosure rating	IP 65

## Product description

With its high signal reserve, the M2000 RES/EDM multi-beam photoelectric safety switch is reliable under harsh industrial conditions. Functions and status information integrated in the device allow rapid commissioning and prevent unnecessary machine downtime. The modular concept cost-effectively achieves maximum machine safety by precisely coordinating

the characteristics of the device to the users' requirements. Interfaces and service concepts complete the product range to provide an ideal solution for the application.

The integrated restart interlock in the M2000 RES/EDM offers the advantages of shorter cable runs and quicker commissioning compared to traditional solutions.

## In-system added value

Combined with SICK safe control solutions

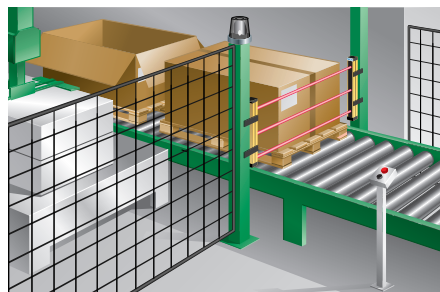
Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

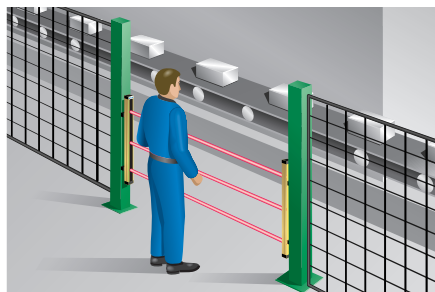
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Storage and conveyor
- Wood industry
- Textile industry
- Stone production
- Electronics industry
- Packaging industry



Packaging industry: M2000 RES/EDM with Flexi Classic on a packaging machine



Storage and conveyor: M2000 RES/EDM on a conveyor belt system



- Restart interlock (RES)
- External device monitoring (EDM)
- Self-testing
- 7-segment display
- Diagnostics
- Alignment aid
- Beam coding



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→ Technical specifications	G-65
→ Dimensional drawings	G-67
→ Connection diagrams	G-68
→ Accessories	G-69
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### M2000 RES/EDM

Usage	As a standalone system
-------	------------------------

### Scanning range 0 m ... 25 m

Number of beams	Beam separation or resolution	System connection	Sender		Receiver	
			Type	Part no.	Type	Part no.
2	500 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-02150A120	1016405	M20S-02150A221	1018032
		M12 x 8 plug	M20S-02150A122	1018186	M20E-02150A222	1018213
3	400 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-03140A120	1016428	M20E-03140A221	1018034
		M12 x 8 plug	M20S-03140A122	1018188	M20E-03140A222	1018215
4	300 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-04130A120	1016509	M20E-04130A221	1018217
		M12 x 8 plug	M20S-04130A122	1018190	M20E-04130A222	1018219
6	170 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-061A3A120	1016446	M20E-061A3A221	1018221
		M12 x 8 plug	M20S-061A3A122	1018192	M20E-061A3A222	1018223
7	170 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-071A3A120	1016434	M20E-071A3A221	1018225
		M12 x 8 plug	M20S-071A3A122	1018194	M20E-071A3A222	1018227
8	116 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-081A2A120	1016438	M20E-081A2A221	1018229
		M12 x 8 plug	M20S-081A2A122	1018196	M20E-081A2A222	1018231
	170 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-081A3A120	1016440	M20E-081A3A221	1018233
		M12 x 8 plug	M20S-081A3A122	1018198	M20E-081A3A222	1018235
9	170 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-091A3A120	1016442	M20E-091A3A221	1018036
		M12 x 8 plug	M20S-091A3A122	1018200	M20E-091A3A222	1018237

### Scanning range 0 m ... 70 m

Number of beams	Beam separation or resolution	System connection	Sender		Receiver	
			Type	Part no.	Type	Part no.
2	500 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-02250A120	1018172	M20E-02250A221	1018206
		M12 x 8 plug	M20S-02250A122	1018174	M20E-02250A222	1018207
3	400 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-03240A120	1018176	M20E-03240A221	1018208
		M12 x 8 plug	M20S-03240A122	1018178	M20E-03240A222	1018209
4	300 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-04230A120	1018180	M20E-04230A221	1018210
		M12 x 8 plug	M20S-04230A122	1018182	M20E-04230A222	1018211

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Number of beams (depending on type)	2 ... 9	
Beam separation or resolution (depending on type)	116 mm ... 500 mm	
Scanning range (depending on type)	0 m ... 25 m / 0 m ... 70 m	
Response time	-	Max. 8 ms
Protection class	III	
Enclosure rating	IP 65 (EN 60529)	
Synchronization	Optical, without separate synchronization	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	2.2 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %	
Housing cross section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	
Shock resistance	10 g, 16 ms (according to IEC 68-2-29)	

<sup>1)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics. For more detailed information on this topic, see page (A-10).



## Functional data

System part	Sender	Receiver
Restart interlock (RES)	-	✓
External device monitoring	-	✓
Beam coding		✓
Self-testing		✓
Configurable scanning range	✓	-

## Electrical data

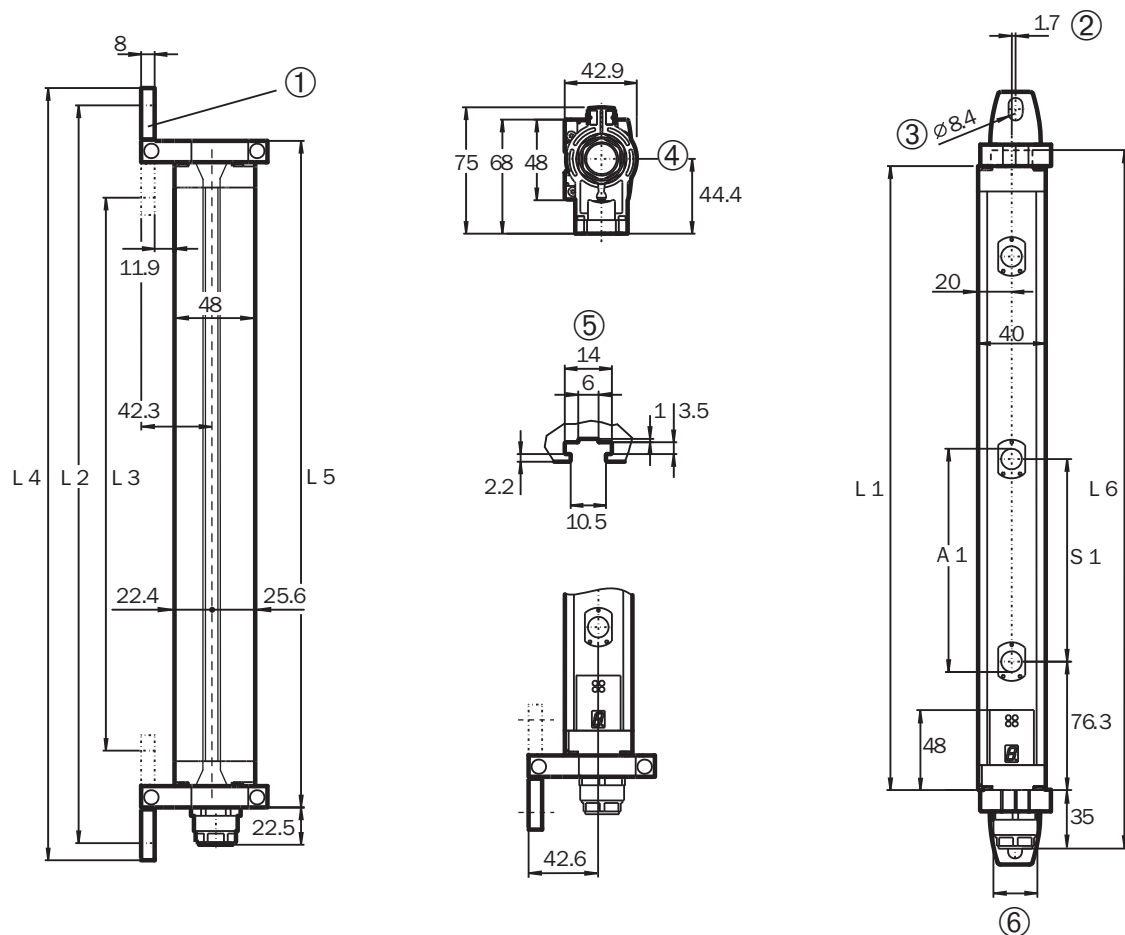
System part	Sender	Receiver
System connection (depending on type)	6-pin + PE Hirschmann plug / M12 x 8 plug	11-pin + PE Hirschmann plug / M12 x 8 plug
Connecting cable wire cross-section		
Hirschmann plug		Max. 1 mm <sup>2</sup>
M12 plug		Max. 0.25 mm <sup>2</sup>
Connecting cable length		
Conductor cross-section 1 mm <sup>2</sup>		Max. 60 m
Conductor cross-section 0.25 mm <sup>2</sup>		Max. 15 m
Supply voltage V <sub>S</sub>	24 V (19.2 V ... 28.8 V)	
Power consumption	3.7 W	5 W
Safety outputs (OSSD)		
Type of output	-	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	-	Min. V <sub>S</sub> - 2.25 V
Switching current	-	Max. 500 mA



# Dimensional drawings

→ You can find more dimensional drawings in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## M2000 RES/EDM



Sender unit with swivel mount (receiver unit not mirror image. Dimensions as M2000 Cascadable)

- ① Mounting clamp
- ② Center of light beam offset
- ③ Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ④ Adjustment
- ⑤ Sliding nut groove for side mounting
- ⑥ Plug PG13.5 according to DIN 43651

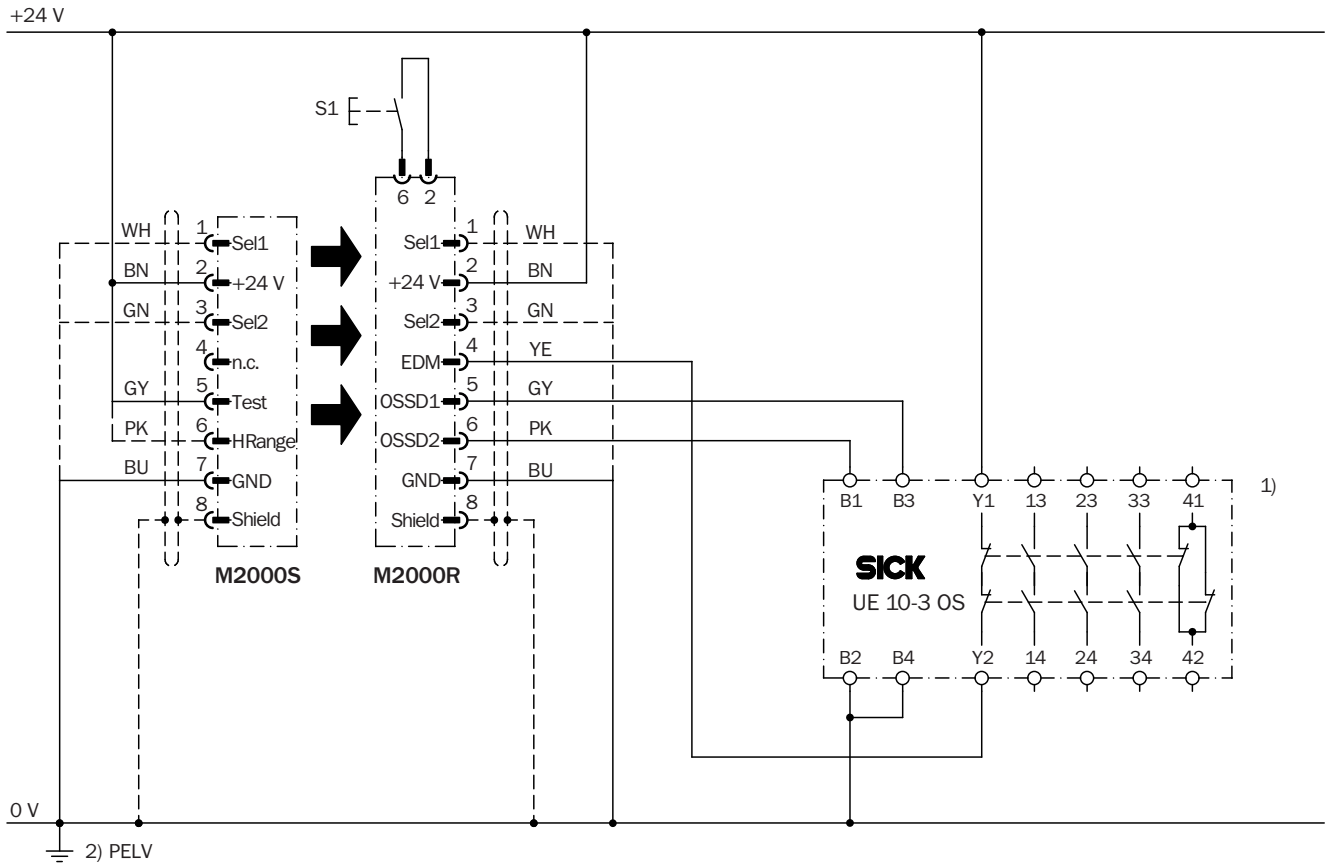
Number of beams	Beam separation	Resolution	L1	L2	L3	L4	L5	L6
2	500	-	630	697	588	718	655	675
3	400	-	931	998	888	1019	956	976
4	300	-	1031	1098	989	1119	1056	1076
8	-	116	851	919	809	939	877	896
6	-	170	916	983	874	1004	941	960
7	-	170	1073	1140	1031	1161	1098	1118
8	-	170	1231	1298	1189	1319	1256	1275
9	-	170	1388	1455	1346	1476	1413	1433

Dimensions in mm

# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## M2000 RES/EDM on UE10-30S safety relay



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**Task**

Interfacing an M2000 RES/EDM multi-beam photoelectric safety switch to UE10-30S.  
 Operating mode: with restart interlock and external device monitoring.

**Function**

The yellow LED on the receiver flashes when the light path is clear and the UE10-30S is de-energized and functioning correctly. The system is ready to be switched on. The system is enabled by pressing S1 (button is pressed and released). When the OSSD1 and OSSD2 outputs are live, the UE10-30S is switched on. On the interruption of one of the light beams, the UE10-30S is deactivated by the OSSD1 and OSSD2 outputs.

**Possible faults**

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The incorrect functioning of the UE10-30S will be detected and will not result in the loss of the shutdown function. Jamming of the S1 button prevents output circuit to enable.

**Comments**

1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) PELV as required in EN 60204-1 / 6.4

The related operating instructions for the integrated devices must be observed.











## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).



## Accessories

### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847

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**Connecting cables**

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
	M12 x 7 + FE	Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343

**Connector**

Connection type	Remark	Type	Part no.
Pre-assembled	For deactivation of the integrated restart interlock	STE-1208G000025KM1	6021238


**Cable receptacles**

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758
	Hirschmann cable socket M26 x 6 + FE	Straight	DOS-0607G000GA3KM0	6006612
		Angled	DOS-0607W000IA3KU0	6007363

**Control switch connection cables**


Connection type	Direction of cable outlet	Cable length	Type	Part no.
Connector	Straight	5 m	STL-127SG05ME25KM0	6021204
		15 m	STL-127SG15ME25KM0	6021205
	Angled	5 m	STL-127SW05ME25KM0	6021830
		15 m	STL-127SW15ME25KM0	6021831

**Power supply units**


Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

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## Device columns with external grooves

Figure	Description	Max. installation length	Number of beams	Beam separation	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	2	500 mm	PU3H96-00000000	2045490
		1165 mm	3	400 mm	PU3H11-00000000	2045641
		1265 mm	4	300 mm	PU3H13-00000000	2045642
		1720 mm	-	-	PU3H17-00000000	2045643
		2020 mm	-	-	PU3H21-00000000	2045644
		2250 mm	-	-	PU3H22-00000000	2045645
		2400 mm	-	-	PU3H24-00000000	2045646

## Device columns for outdoor use

Figure	Description	Number of beams	Beam separation	Suitable for	Type	Part no.
	With front screen heating, 220 V, including brackets and cable socket (without multiple light beam safety device)	2	500 mm	M20x-02x50Axxx	PUG12-S02	2023707
		3	400 mm	M20x-03x40Axxx	PUG12-S01	2025441

## Mirror columns with separate mirrors





Figure	Column height	Suitable for	Remark	Type	Part no.
 <small>Product may differ from illustration</small>	985 mm	M40x-0250xxxxx, M20x-02x05xxxx	Completely mounted, including mirrors	PM3S96-00240020	1040619
	1185 mm	M40x-0340xxxxx, M20x-03x40x1xx		PM3S11-00330030	1040625
	1285 mm	M40x-0430xxxxx, M20x-04x30xxxx		PM3S13-00430040	1040626

## Mirror columns with protective field height mirror



Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0


## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731

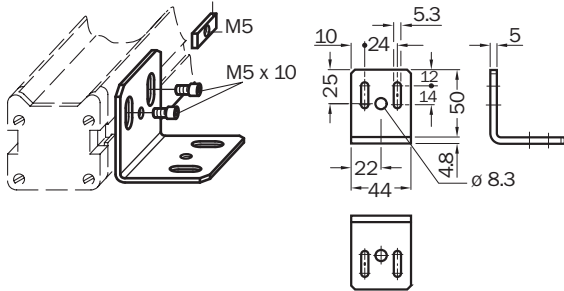
## Configuration tools

Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

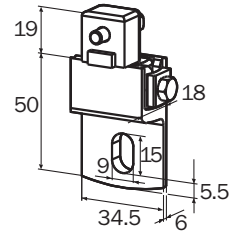
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Dimensional drawings mounting systems

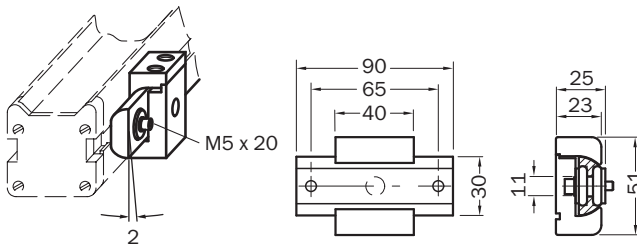
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



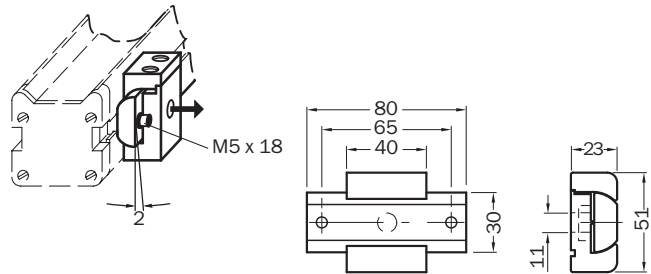
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



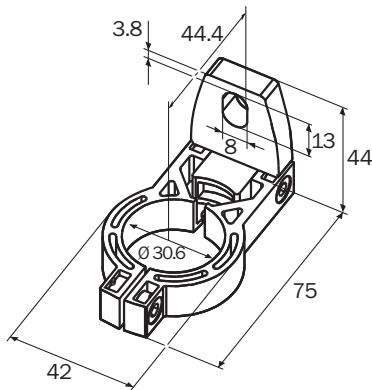
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



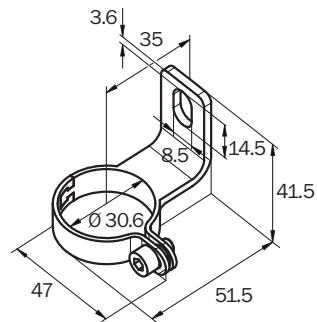
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



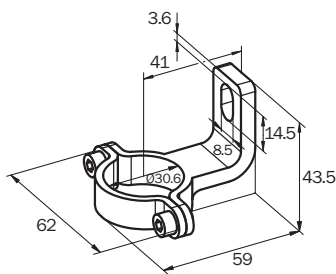
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



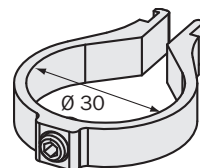
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2SMMEAAL2**  
Omega bracket, mounting kit for device columns



Dimensions in mm





- Cascade
  - Max. 3 devices
  - Max. 3 m cable length
- External device monitoring (EDM)
- Self-testing
- 7-segment display
- Diagnostics
- Alignment aid
- Beam coding



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## Technical data overview

Scanning range	0 m ... 25 m
Number of beams (depending on type)	2 ... 9
Beam separation or resolution (depending on type)	116 mm ... 500 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508), SILCL2 (EN 62061)
Enclosure rating	IP 65

## Product description

With its high signal reserve, the M2000 Cascadable multi-beam photoelectric safety switch is reliable under harsh industrial conditions. Functions and status information integrated in the device allow rapid commissioning and prevent unnecessary machine downtime. The modular concept cost-effectively achieves maximum machine safety by precisely coordinating

the characteristics of the device to the users' requirements. Interfaces and service concepts complete the product range to provide an ideal solution for the application.

With the cascadable variants, photoelectric safety switches can be flexibly adapted to the existing installation.

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	O-2
Flexi Soft	✓	✓	✓	O-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Storage and conveyor
- Wood industry
- Textile industry
- Stone production
- Electronics industry
- Packaging industry

Further information	Page
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→ Connection diagrams	G-79
→ Accessories	G-80
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### M2000 Cascadable

Usage	As first, middle or last system in a cascade
-------	--

### Scanning range 0 m ... 25 m

■ External device monitoring: ✓

Number of beams	Beam separation or resolution	System connection	Sender		Receiver	
			Type	Part no.	Type	Part no.
2	500 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-02150A220	1018031	M20S-02150A221	1018032
		M12 x 8 plug	M20S-02150A222	1018212	M20E-02150A222	1018213
3	400 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-03140A220	1018033	M20E-03140A221	1018034
		M12 x 8 plug	M20S-03140A222	1018214	M20E-03140A222	1018215
4	300 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-04130A220	1018216	M20E-04130A221	1018217
		M12 x 8 plug	M20S-04130A222	1018218	M20E-04130A222	1018219
6	170 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-061A3A220	1018220	M20E-061A3A221	1018221
		M12 x 8 plug	M20S-061A3A222	1018222	M20E-061A3A222	1018223
7	170 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-071A3A220	1018224	M20E-071A3A221	1018225
		M12 x 8 plug	M20S-071A3A222	1018226	M20E-071A3A222	1018227
8	116 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-081A2A220	1018228	M20E-081A2A221	1018229
		M12 x 8 plug	M20S-081A2A222	1018230	M20E-081A2A222	1018231
	170 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-081A3A220	1018232	M20E-081A3A221	1018233
		M12 x 8 plug	M20S-081A3A222	1018234	M20E-081A3A222	1018235
9	170 mm	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug	M20S-091A3A220	1018035	M20E-091A3A221	1018036
		M12 x 8 plug	M20S-091A3A222	1018236	M20E-091A3A222	1018237



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Number of beams (depending on type)	2 ... 9	
Beam separation or resolution (depending on type)	116 mm ... 500 mm	
Scanning range	0 m ... 25 m	
Response time	–	Max. 8 ms
Protection class	III	
Enclosure rating	IP 65 (EN 60529)	
Synchronization	Optical, without separate synchronization	
Safety related parameters		
Type	Type 2 (IEC 61496)	
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)	
Category	Category 2 (EN ISO 13849)	
Test rate (internal test)	13/s (EN ISO 13849)	
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	
PFHd (mean probability of a dangerous failure per hour)	2.2 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Storage temperature from ... to	–25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %	
Housing cross section	48 mm x 40 mm	
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	
Shock resistance	10 g, 16 ms (according to IEC 68-2-29)	

<sup>1)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics. For more detailed information on this topic, see page (A-10).

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## Functional data

System part	Sender	Receiver
External device monitoring	-	✓
Beam coding		✓
Self-testing		✓

## Electrical data

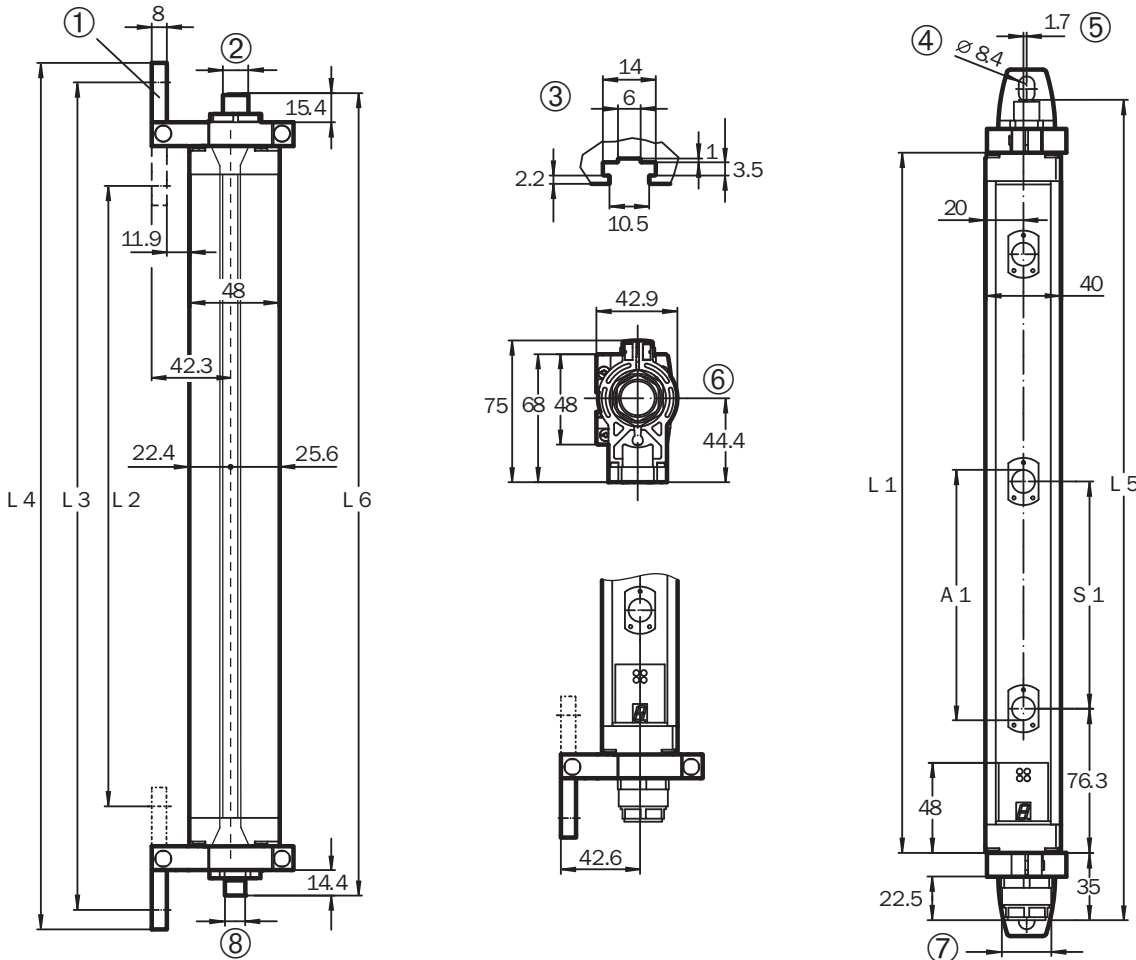
System part	Sender	Receiver
System connection (depending on type)	6-pin + PE Hirschmann plug / M12 x 8 plug	11-pin + PE Hirschmann plug / M12 x 8 plug
Connecting cable wire cross-section	Hirschmann plug M12 plug Max. 1 mm <sup>2</sup> Max. 0.25 mm <sup>2</sup>	
Connecting cable length	Conductor cross-section 1 mm <sup>2</sup> Max. 60 m Conductor cross-section 0.25 mm <sup>2</sup> Max. 15 m	
Supply voltage $V_s$	24 V (19.2 V ... 28.8 V)	
Power consumption	3.7 W	5 W
Safety outputs (OSSD)	Type of output - 2 PNP semiconductors, short-circuit protected, cross-circuit monitored Switching voltage HIGH - Min. $V_S$ - 2.25 V Switching current - Max. 500 mA	



# Dimensional drawings

→ You can find more dimensional drawings in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## M2000 Cascadable



Sender unit with swivel mount (receiver unit mirror image)

- ① Mounting clamp
- ② M12 x 8 socket (standard)
- ③ Sliding nut groove for slide mounting
- ④ Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ⑤ Center of light beam offset
- ⑥ Adjustment
- ⑦ Plug PG13.5 according to DIN 43651
- ⑧ Plug M12 x 8

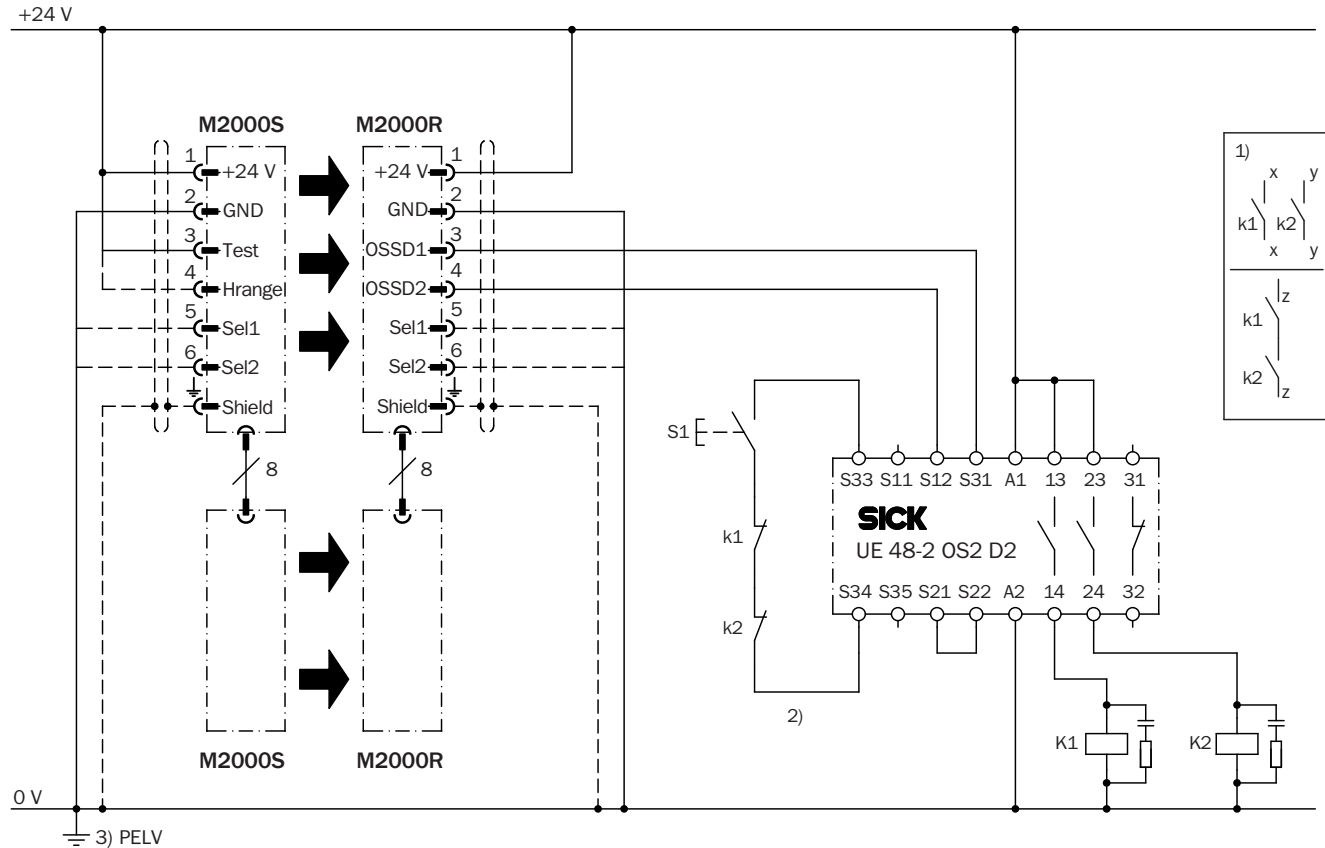
Number of beams	Beam separation	Resolution	L1	L2	L3	L4	L5	L6
2	500	-	630	588	697	718	694	686
3	400	-	931	888	998	1019	995	987
4	300	-	1031	989	1098	1119	1095	1087
8	-	116	851	809	919	939	915	907
6	-	170	916	874	983	1004	979	971
7	-	170	1073	1031	1140	1161	1137	1129
8	-	170	1231	1189	1298	1319	1294	1286
9	-	170	1388	1346	1455	1476	1452	1444

Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### M2000 Cascadable on UE48-20S safety relay



#### Task

Interfacing two M2000 Cascadable multi-beam photoelectric safety switches to UE48-20S.  
Operating mode: with restart interlock and external device monitoring.

#### Function

If the light path is clear, the OSSD1 and OSSD2 outputs are live. The system is ready to switch on if K1 and K2 are de-energized. By pressing S1 (button is pressed and released), the UE48-20S is energized and its 13 - 14 and 23 - 24 contacts activate K1 and K2. On interruption of one of the light beams, the UE48-20S is de-energized by the OSSD1 and OSSD2 outputs and K1 and K2 are deactivated.

#### Possible faults

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The incorrect functioning of one of the K1 or K2 contactors will be detected and does not result in the loss of the shutdown function. Jamming of the S1 button will prevent the UE48-20S from enabling.

#### Comments

- 1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.
- 2) The external device monitoring is only static.
- 3) PELV as required in EN 60204-1 / 6.4

The related operating instructions for the integrated devices must be observed.









## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).



## Accessories

### Mounting systems





Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847

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## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
	M12 x 7 + FE	Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343


## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758
	Hirschmann cable socket M26 x 6 + FE	Straight	DOS-0607G000GA3KM0	6006612
		Angled	DOS-0607W000IA3KU0	6007363


## Cascade connection cables

Connection type	Direction of cable outlet	Cable length	Type	Part no.
M12 x 8	Plug straight/ socket straight	0.25 m	DSL-127SGM25E25KM0	6021000
		0.5 m	DSL-127SG0M5E25KM0	6021001
		1 m	DSL-127SG01ME25KM0	6021002
		1.5 m	DSL-127SG1M5E25KM0	6021003
		2 m	DSL-127SG02ME25KM0	6021004
		2.5 m	DSL-127SG2M5E25KM0	6021005
		3 m	DSL-127SG03ME25KM0	6021006


## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

**Device columns with external grooves**


Figure	Description	Max. installation length	Number of beams	Beam separation	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	2	500 mm	PU3H96-00000000	2045490
		1165 mm	3	400 mm	PU3H11-00000000	2045641
		1265 mm	4	300 mm	PU3H13-00000000	2045642
		1720 mm	-	-	PU3H17-00000000	2045643
		2020 mm	-	-	PU3H21-00000000	2045644
		2250 mm	-	-	PU3H22-00000000	2045645
		2400 mm	-	-	PU3H24-00000000	2045646

**Device columns for outdoor use**

Figure	Description	Number of beams	Beam separation	Suitable for	Type	Part no.
	With front screen heating, 220 V, including brackets and cable socket (without multiple light beam safety device)	2	500 mm	M20x-02x50Axxx	PUG12-S02	2023707
		3	400 mm	M20x-03x40Axxx	PUG12-S01	2025441

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**Mirror columns with separate mirrors**





Figure	Column height	Suitable for	Remark	Type	Part no.
 <small>Product may differ from illustration</small>	985 mm	M40x-0250xxxxx, M20x-02x05xxxx	Completely mounted, including mirrors	PM3S96-00240020	1040619
	1185 mm	M40x-0340xxxxx, M20x-03x40x1xx		PM3S11-00330030	1040625
	1285 mm	M40x-0430xxxxx, M20x-04x30xxxx		PM3S13-00430040	1040626

**Mirror columns with protective field height mirror**


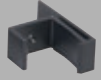
Figure	Column height	Mirror length	Type	Part no.
	1285 mm	900 mm	PM3C13-00030000	1043453
	1720 mm	1350 mm	PM3C17-00030000	1043454
	2000 mm	1650 mm	PM3C19-00030000	1043455
	2200 mm	1800 mm	PM3C20-00030000	1043456

→ For more detailed data on mirror columns and device columns, see page I-0


## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAAL2	2045883
	Suitable for all mirror columns PM3Sxx-xxxxxxx and PM3Cxx-xxxxxxx, including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Laser alignment aid

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731

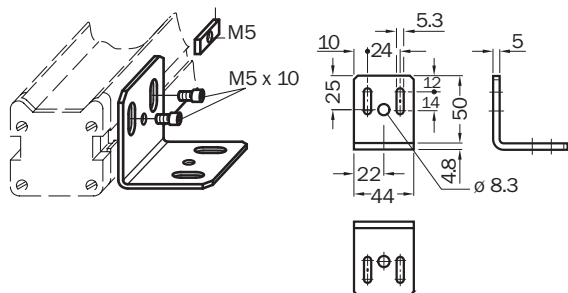
## Configuration tools

Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

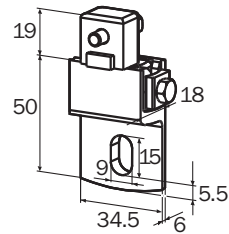
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Dimensional drawings mounting systems

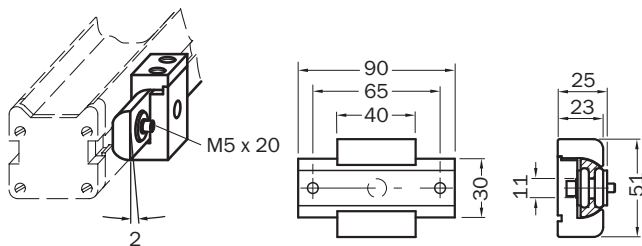
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



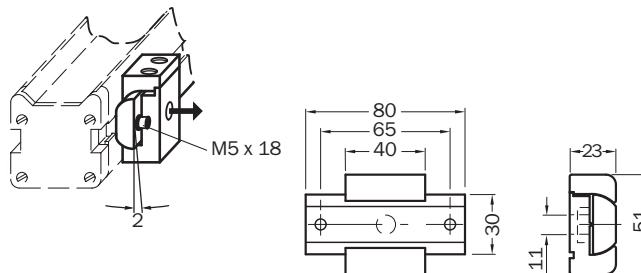
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



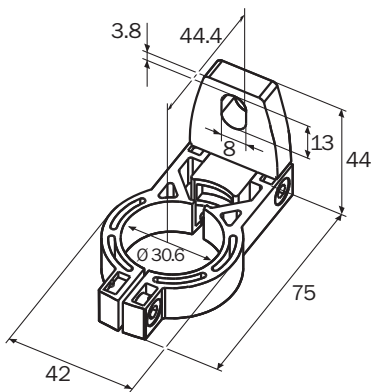
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



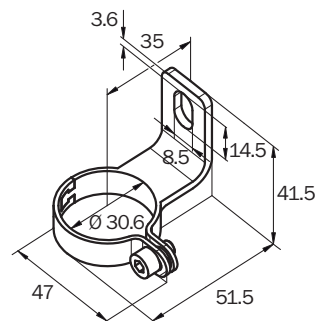
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



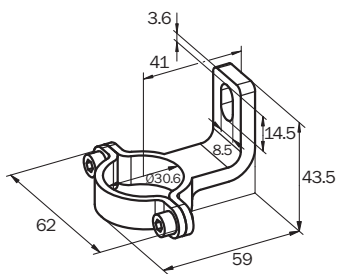
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



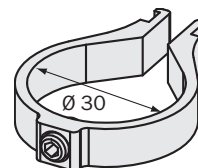
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2SMMEAAL2**  
Omega bracket, mounting kit for device columns



Dimensions in mm



## Technical data overview

Scanning range	0 m ... 6 m
Number of beams	1
Beam separation	500 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508), SILCL2 (EN 62061)
Enclosure rating	IP 65

## Product description

The M2000 A/P Standard multi-beam photoelectric safety switch comprises a sender/receiver unit on the active side (A) and one or more deflector mirrors on the passive side (P). With their high signal reserve, they are reliable under harsh industrial condi-

tions. Functions and status information integrated in the device allow rapid commissioning and prevent unnecessary machine downtime. Interfaces and service concepts complete the product range to provide an ideal solution for the application.

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Storage and conveyor
- Wood industry
- Textile industry
- Stone production
- Electronics industry
- Packaging industry



- External device monitoring (EDM)
- Self-testing
- 7-segment display
- Diagnostics
- Alignment aid



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→ Dimensional drawings	G-88
→ Connection diagrams	G-88
→ Accessories	G-89
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### M2000 A/P Standard

Usage	As a standalone system
-------	------------------------

### Scanning range 0 m ... 6 m

- Number of beams: 1
- Beam separation: 500 mm

System connection	External device monitoring	Sender/receiver in one housing		Mirror	
		Type	Part no.	Type	Part no.
11-pin + PE Hirschmann plug	-	M20Z-02550A121	1016513	PSR01-1501	1016677
6-pin + PE Hirschmann plug	-	M20Z-02550A120	1026510		1016677
M12 x 8 plug	✓	M20Z-02550A122	1018361		1016677

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender/receiver in one housing	Mirror
Number of beams	1	-
Beam separation	500 mm	
Scanning range	0 m ... 6 m	-
Response time	Max. 7 ms	-
Protection class	III	-
Enclosure rating	IP 65 (EN 60529)	-
Synchronization	Optical, without separate synchronization	-
<b>Safety related parameters</b>		
Type	Type 2 (IEC 61496)	-
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)	-
Category	Category 2 (EN ISO 13849)	-
Test rate (internal test)	13/s (EN ISO 13849)	-
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	-
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	-
PFHd (mean probability of a dangerous failure per hour)	$2.2 \times 10^{-8}$ (EN ISO 13849)	-
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	-
Ambient operating temperature from ... to	0 °C ... +55 °C	-
Storage temperature from ... to	-25 °C ... +70 °C	-
Air humidity from ... to	15 % ... 95 %	-
Housing cross section	48 mm x 40 mm	55 mm x 52 mm
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	-
Shock resistance	10 g, 16 ms (according to IEC 68-2-29)	-

<sup>1)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics. For more detailed information on this topic, see page (A-10).

## Functional data

System part	Sender/receiver in one housing	Mirror
External device monitoring (depending on type)	✓	-
Self-testing	✓	-

## Electrical data

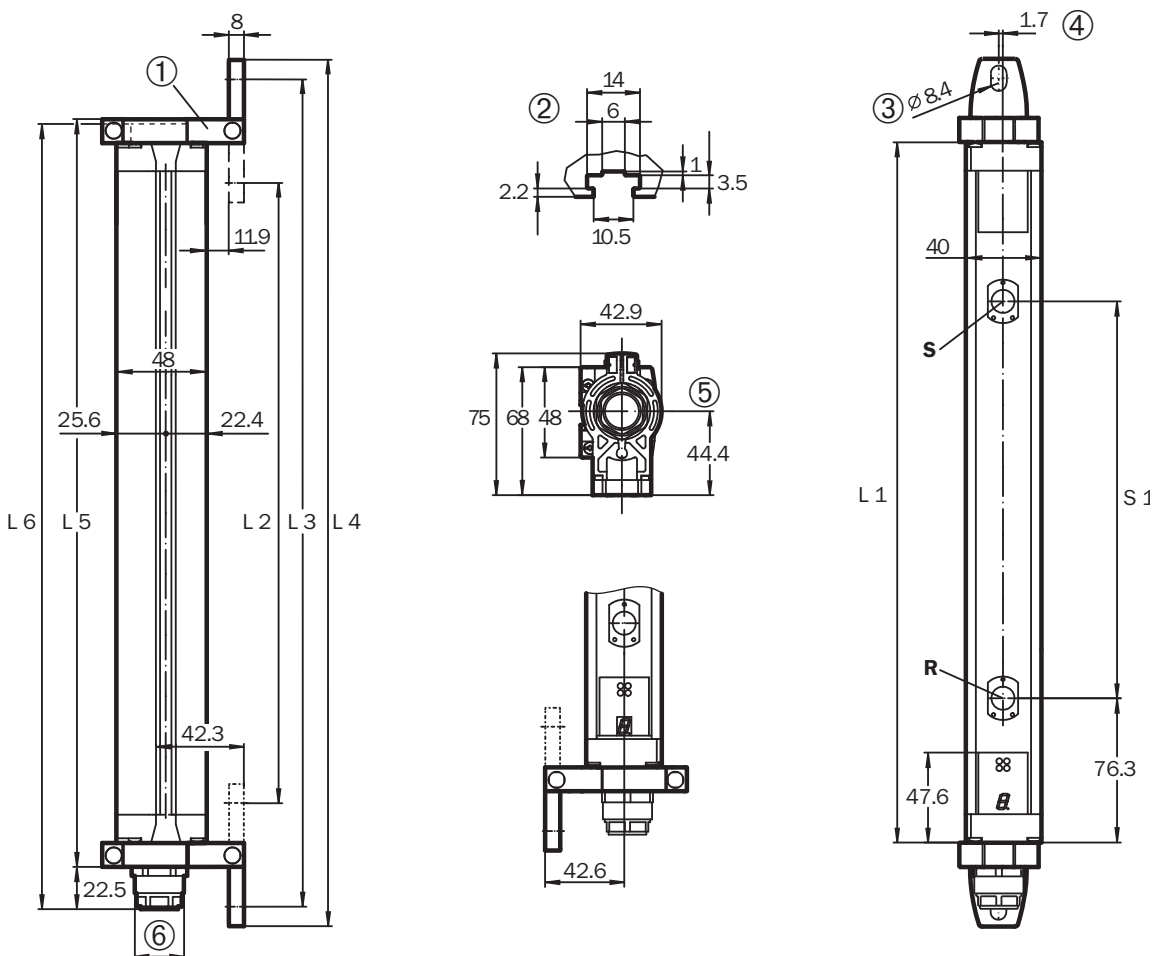
System part	Sender/receiver in one housing	Mirror
System connection (depending on type)	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug / M12 x 8 plug	-
Connecting cable wire cross-section	Hirschmann plug	Max. 1 mm <sup>2</sup>
	M12 plug	Max. 0.25 mm <sup>2</sup>
Connecting cable length	Conductor cross-section 1 mm <sup>2</sup>	Max. 60 m
	Conductor cross-section 0.25 mm <sup>2</sup>	Max. 15 m
Supply voltage $V_S$	24 V (19.2 V ... 28.8 V)	-
Power consumption	7.5 W	-
Safety outputs (OSSD)	Type of output	2 PNP semiconductors, short-circuit protected, cross-circuit monitored
	Switching voltage HIGH	Min. $V_S - 2.25 V$
	Switching current	Max. 500 mA

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# Dimensional drawings

→ You can find more dimensional drawings in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## M2000 A/P Standard



Sender/receiver unit with swivel mount

- ① Mounting clamp
- ② Sliding nut groove for side mounting
- ③ Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ④ Adjustment
- ⑤ Center of light beam offset
- ⑥ Hirschmann plug DIN 43651

Number of beams	S1	L1	L2	L3	L4	L5	L6
2	500	653	611	720	741	678	700

Dimensions in mm

# Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)

## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).



## Accessories

### Mounting systems





Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Mounting kit 9, swivel function, two swivel mounts, for M2000-A/P/active and two side brackets for deflector mirror PSR01-1501	4	BEF-0AAAA0004S01	2021569
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847

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## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
	M12 x 7 + FE	Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343

## Cable receptacles


Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758
	Hirschmann cable socket M26 x 6 + FE	Straight	DOS-0607G000GA3KM0	6006612
		Angled	DOS-0607W000IA3KU0	6007363

## Power supply units


Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790

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## Device columns with external grooves


Figure	Description	Max. installation length	Number of beams	Beam separation	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	2	500 mm	PU3H96-00000000	2045490
		1165 mm	3	400 mm	PU3H11-00000000	2045641
		1265 mm	4	300 mm	PU3H13-00000000	2045642
		1720 mm	-	-	PU3H17-00000000	2045643
		2020 mm	-	-	PU3H21-00000000	2045644
		2250 mm	-	-	PU3H22-00000000	2045645
		2400 mm	-	-	PU3H24-00000000	2045646

## Device columns for outdoor use

Figure	Description	Number of beams	Beam separation	Suitable for	Type	Part no.
	With front screen heating, 220 V, including brackets and cable socket (without multiple light beam safety device)	2	500 mm	M20x-02x50Axxx, M20Z-02x50Axxx	PUG12-S02	2023707




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## Mirror columns with separate mirrors

Figure	Column height	Suitable for	Remark	Type	Part no.
 <small>Product may differ from illustration</small>	985 mm	M40Z-0250xxxx M20Z-02x05xxxx	Vertical deflection	PM2Z96-30240020	1027265

→ For more detailed data on mirror columns and device columns, see page I-0




## Column parts and accessories

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAL2	2045883


**Deflector mirrors**

Mirror material	Remark	Type	Part no.
Glass	With end caps for swivel mount bracket (large housing) and front screen	PSR01-S04	1025227

**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731

**Configuration tools**

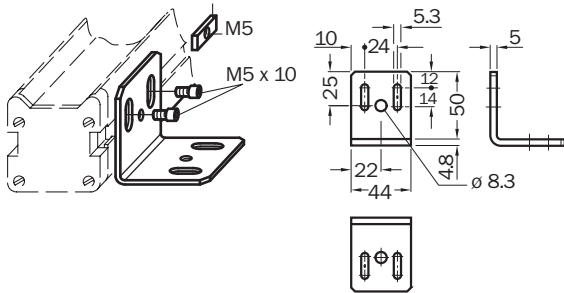
Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

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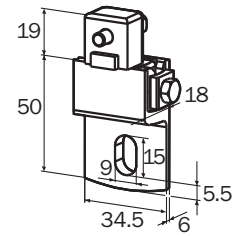


Dimensional drawings mounting systems

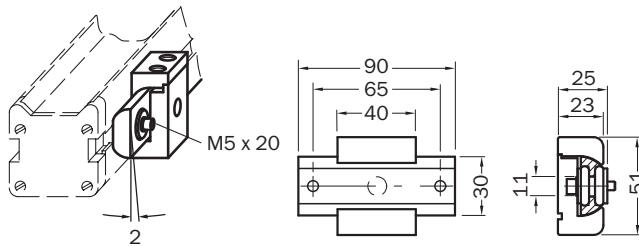
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



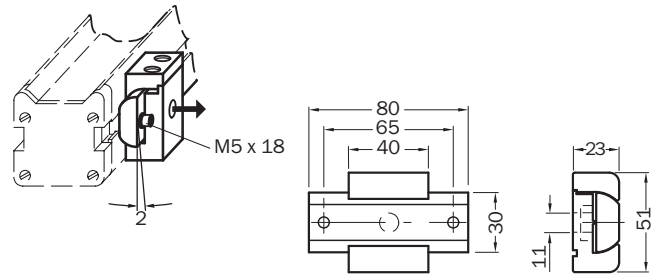
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



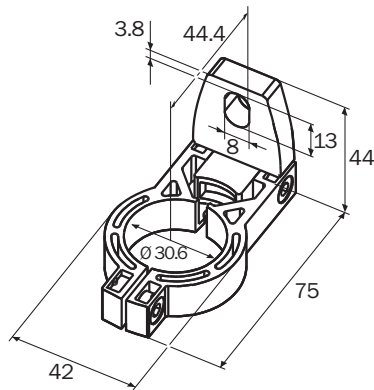
**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



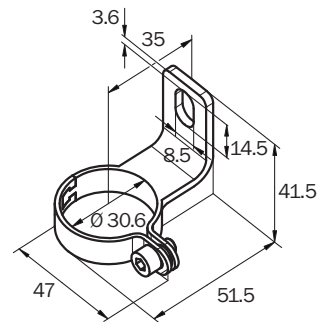
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



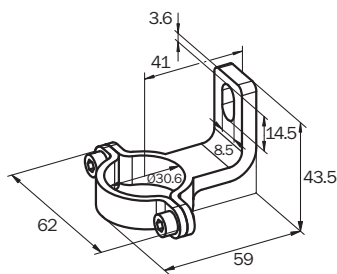
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



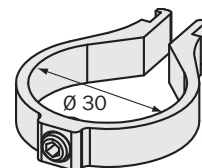
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



**BEF-2SMMEAAL2**  
Omega bracket, mounting kit for device columns



Dimensions in mm





- Restart interlock (RES)
- External device monitoring (EDM)
- Self-testing
- 7-segment display
- Diagnostics
- Alignment aid



G

## Technical data overview

Scanning range	0 m ... 6 m
Number of beams	1
Beam separation	500 mm
Type	Type 2 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508), SILCL2 (EN 62061)
Enclosure rating	IP 65

## Product description

The M2000 A/P RES/EDM multi-beam photoelectric safety switch comprises a sender/receiver unit on the active side (A) and one or more deflector mirrors on the passive side (P). With their high signal reserve, they are reliable under harsh industrial conditions. Functions and status information integrated in the device allow rapid commissioning and prevent unne-

sary machine downtime. Interfaces and service concepts complete the product range to provide an ideal solution for the application. The integrated restart interlock in the M2000 A/P RES/EDM offers the advantages of shorter cable runs and quicker commissioning compared to traditional solutions.

## In-system added value

Combined with SICK safe control solutions

Combination with	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic	✓	✓	✓	0-2
Flexi Soft	✓	✓	✓	0-25
UE48-20S	✓	✓	-	N-46
UE48-30S	✓	✓	-	N-52
UE10-30S	Contact expansion module			N-63

→ For more combinations, see annex

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Storage and conveyor
- Wood industry
- Textile industry
- Stone production
- Electronics industry
- Packaging industry

Further information	Page
→ Dimensional drawings	G-97
→ Connection diagrams	G-97
→ Accessories	G-98
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### M2000 A/P RES/EDM

Usage	As a standalone system
-------	------------------------

### Scanning range 0 m ... 6 m

- Number of beams: 1
- Beam separation: 500 mm

System connection	Sender/receiver in one housing		Mirror	
	Type	Part no.	Type	Part no.
11-pin + PE Hirschmann plug	M20Z-02550A221	1018239	PSR01-1501	1016677
6-pin + PE Hirschmann plug	M20Z-02550A220	1026511		1016677
M12 x 8 plug	M20Z-02550A222	1018362		1016677

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender/receiver in one housing	Mirror
Number of beams	1	-
Beam separation	500 mm	
Scanning range	0 m ... 6 m	-
Response time	Max. 7 ms	-
Protection class	III	-
Enclosure rating	IP 65 (EN 60529)	-
Safety related parameters		
Type	Type 2 (IEC 61496)	-
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)	-
Category	Category 2 (EN ISO 13849)	-
Test rate (internal test)	13/s (EN ISO 13849)	-
Maximum demand rate	8/min (EN ISO 13849) <sup>1)</sup>	-
Performance level	PL d (EN ISO 13849), pay attention to optical characteristics! <sup>2)</sup>	-
PFHd (mean probability of a dangerous failure per hour)	2.2 x 10 <sup>-8</sup> (EN ISO 13849)	-
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	-
Ambient operating temperature from ... to	0 °C ... +55 °C	-
Storage temperature from ... to	-25 °C ... +70 °C	-
Air humidity from ... to	15 % ... 95 %	-
Housing cross section	48 mm x 40 mm	55 mm x 52 mm
Vibration resistance	5 g (10 Hz ... 55 Hz), IEC 68-2-6	-
Shock resistance	10 g, 16 ms (according to IEC 68-2-29)	-

<sup>1)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

<sup>2)</sup> The performance level does not contain any specific requirements on aspects such as the optical characteristics. For more detailed information on this topic, see page (A-10).

## Functional data

System part	Sender/receiver in one housing	Mirror
Restart interlock (depending on type)	✓	-
External device monitoring	✓	-
Self-testing	✓	-

## Electrical data

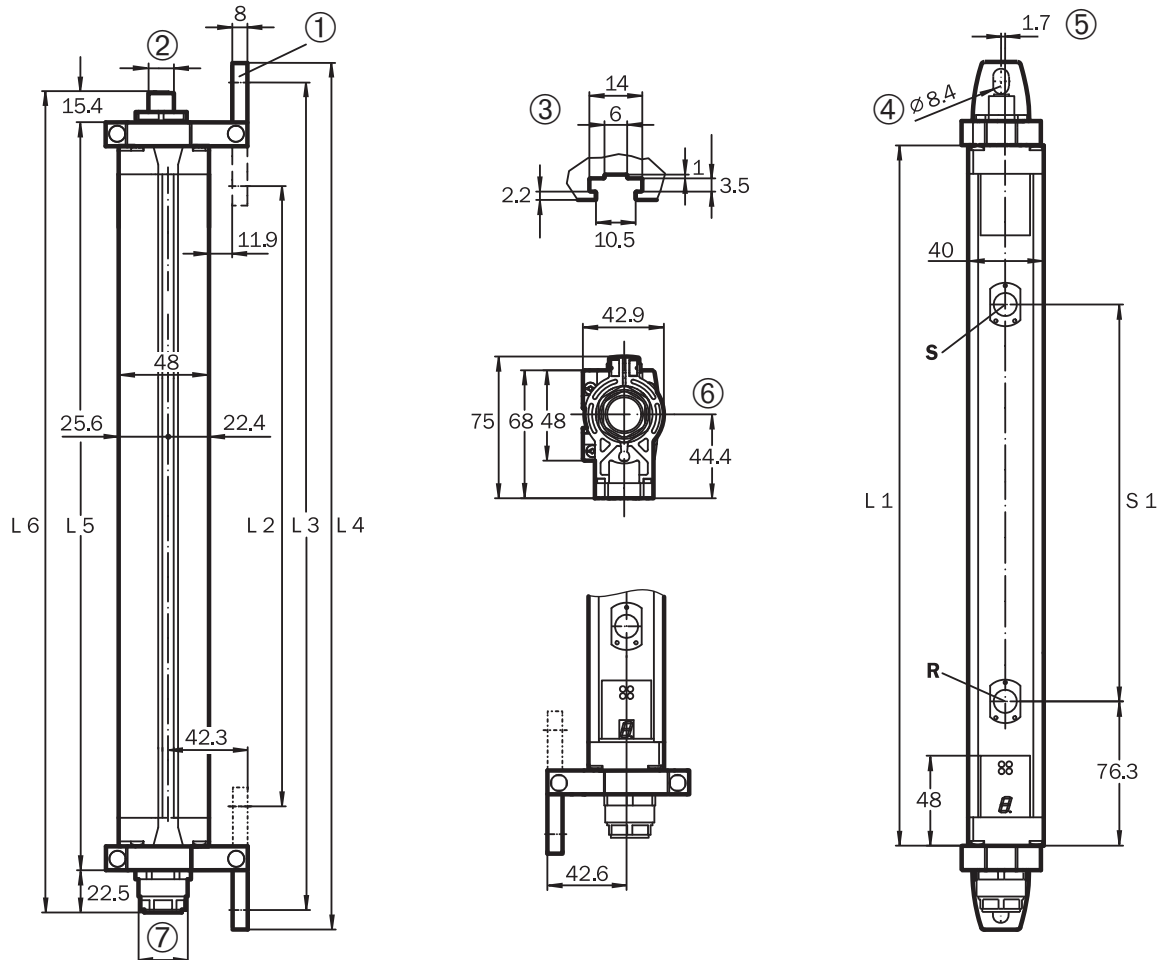
System part	Sender/receiver in one housing	Mirror
System connection (depending on type)	6-pin + PE Hirschmann plug / 11-pin + PE Hirschmann plug / M12 x 8 plug	-
Connecting cable wire cross-section	Hirschmann plug	-
	M12 plug	-
Connecting cable length	Conductor cross-section 1 mm <sup>2</sup>	-
	Conductor cross-section 0.25 mm <sup>2</sup>	-
Supply voltage V <sub>S</sub>	24 V (19.2 V ... 28.8 V)	-
Power consumption	7.5 W	-
Safety outputs (OSSD)	Type of output	-
	Switching voltage HIGH	-
	Switching current	-

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## Dimensional drawings

→ You can find more dimensional drawings in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### M2000 A/P RES/EDM



Sender/receiver unit with swivel mount

- ① Mounting clamp
- ② M12 x 8 socket (standard)
- ③ Sliding nut groove for slide mounting
- ④ Hexagon screw M8, DIN 933 with washer DIN 9021 (not supplied with delivery)
- ⑤ Center of light beam offset
- ⑥ Adjustment
- ⑦ Plug PG13.5 according to DIN 43651
- S** Sender
- R** Receiver

N	S1	L1	L2	L3	L4	L5	L6
2	500	653	611	720	741	678	716

Dimensions in mm

## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)

## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).



## Accessories

### Mounting systems

Figure	Property	Packing unit	Type	Part no.
	Mounting kit 1, rigid	4	BEF-3WNGBAST4	7021352
	Mounting kit 6, swivel function, side bracket	4	BEF-1SHABAZN4	2019506
	Mounting kit 3, adjustable, vibration-absorbing	4	BEF-1SHADAAL4	2017752
	Mounting kit 2, adjustable	4	BEF-1SHABAAL4	2017751
	Mounting kit 2, swivel mount	4	BEF-2SMMEAKU4	2019659
	Stainless steel bracket, adjustable	4	BEF-2SMMEAES4	2023708
	Reinforced stainless steel bracket, adjustable	4	BEF-2SMMVAES4	2026850
	Mounting kit, swivel mount, extendable	2	BEF-0SMMEA002	2046172
	Mounting kit 9, swivel function, two swivel mounts, for M2000-A/P/active and two side brackets for deflector mirror PSR01-1501	4	BEF-0AAAA0004S01	2021569
	Omega bracket, flexible and quick installation with only one screw	4	BEF-2SMMEAAL4	2044847

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## Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Type	Part no.
	M12 x 7 + FE	Straight	2.5 m	DOL-127SG2M5E25KM0	6020537
			5 m	DOL-127SG05ME25KM0	6020354
			7.5 m	DOL-127SG7M5E25KM0	6020353
			10 m	DOL-127SG10ME25KM0	6020352
			15 m	DOL-127SG15ME25KM0	6020872
	M12 x 7 + FE	Angled	5 m	DOL-127SW05ME25KM0	6021342
			15 m	DOL-127SW15ME25KM0	6021343

## Connector

Connection type	Remark	Type	Part no.
Pre-assembled	For deactivation of the integrated restart interlock	STE-1208G000025KM1	6021238


## Cable receptacles

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Hirschmann cable socket M26 x 11 + FE	Straight	DOS-0612G000GA3KM0	6020757
		Angled	DOS-0612W000GA3KM0	6020758
	Hirschmann cable socket M26 x 6 + FE	Straight	DOS-0607G000GA3KM0	6006612
		Angled	DOS-0607W000IA3KU0	6007363


## Control switch connection cables

Connection type	Direction of cable outlet	Cable length	Type	Part no.
Connector	Straight	5 m	STL-127SG05ME25KM0	6021204
		15 m	STL-127SG15ME25KM0	6021205
	Angled	5 m	STL-127SW05ME25KM0	6021830
		15 m	STL-127SW15ME25KM0	6021831


## Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


## Device columns with external grooves

Figure	Description	Max. installation length	Number of beams	Beam separation	Type	Part no.
	Robust device columns with two external mounting grooves	965 mm	2	500 mm	PU3H96-00000000	2045490
		1165 mm	3	400 mm	PU3H11-00000000	2045641
		1265 mm	4	300 mm	PU3H13-00000000	2045642
		1720 mm	-	-	PU3H17-00000000	2045643
		2020 mm	-	-	PU3H21-00000000	2045644
		2250 mm	-	-	PU3H22-00000000	2045645
		2400 mm	-	-	PU3H24-00000000	2045646

## Device columns for outdoor use

Figure	Description	Number of beams	Beam separation	Suitable for	Type	Part no.
	With front screen heating, 220 V, including brackets and cable socket (without multiple light beam safety device)	2	500 mm	M20x-02x50Axxx, M20Z-02x50Axxx	PUG12-S02	2023707

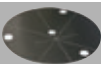


## Mirror columns with separate mirrors

Figure	Column height	Suitable for	Remark	Type	Part no.
 <small>Product may differ from illustration</small>	985 mm	M40Z-0250xxxx M20Z-02x05xxxx	Vertical deflection	PM2Z96-30240020	1027265

→ For more detailed data on mirror columns and device columns, see page I-0





**Column parts and accessories**

Figure	Description	Packing unit	Type	Part no.
	For floor fastening	1	Adjusting plate	4031053
			Steel plug	5308961
	Omega bracket, mounting kit for device columns	2	BEF-2SMMEAAL2	2045883


**Deflector mirrors**

Mirror material	Remark	Type	Part no.
Glass	With end caps for swivel mount bracket (large housing) and front screen	PSR01-S04	1025227

**Laser alignment aid**

Figure	Description	Scanning range	Voltage supply	Type of light	Part no.
	Laser alignment aid AR60	Max. 60 m	2 batteries, 1.5 V Micro/AAA	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	1015741
	Adapter for AR60, for large housing profile	-	-	-	4032461
	Adapter for AR60, for large housing profile in PU3Hxx-xxxxxxx device column	-	-	-	4056731

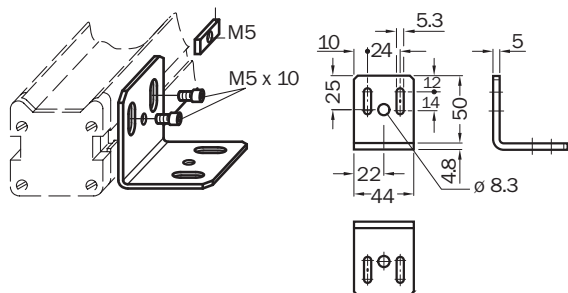
**Configuration tools**

Figure	Description	Suitable for	Type	Part no.
	For deactivation of the external device monitoring and integrated restart interlock	C2000, M2000: deactivation of the external device monitoring; C4000 Micro, C4000 Basic Plus: deactivation of the external device monitoring and integrated restart interlock	Reset tool	6022103

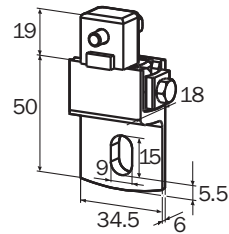
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Dimensional drawings mounting systems

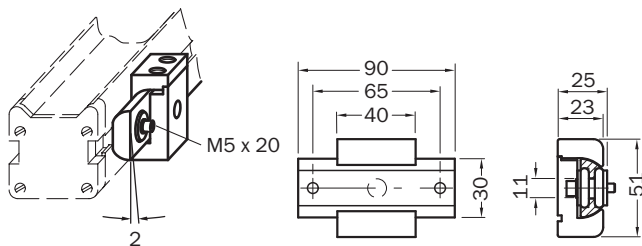
**BEF-3WNGBAST4**  
Mounting kit 1, rigid



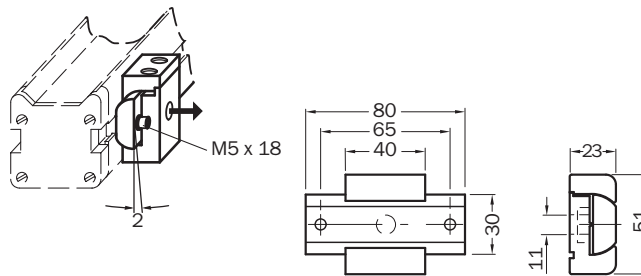
**BEF-1SHABAZN4**  
Mounting kit 6, swivel function, side bracket



**BEF-1SHADAAL4**  
Mounting kit 3, adjustable, vibration-absorbing



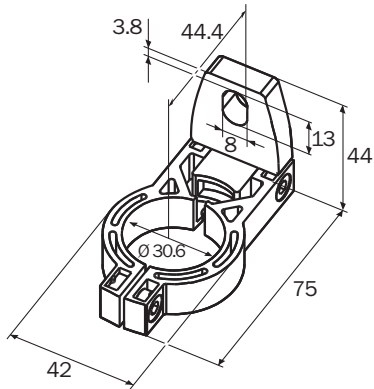
**BEF-1SHABAAL4**  
Mounting kit 2, adjustable



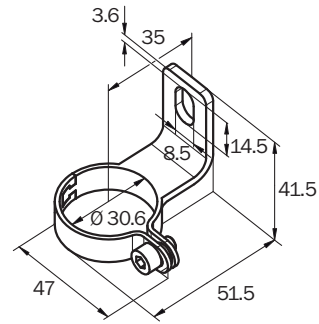
Dimensions in mm



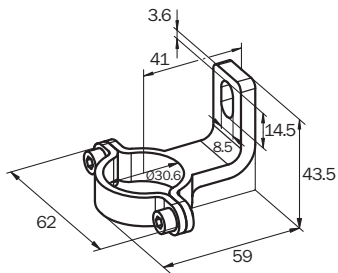
**BEF-2SMMEAKU4**  
Mounting kit 2, swivel mount



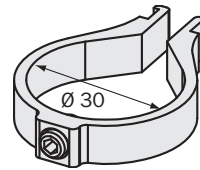
**BEF-2SMMEAES4**  
Stainless steel bracket, adjustable



**BEF-2SMMVAES4**  
Reinforced stainless steel bracket, adjustable



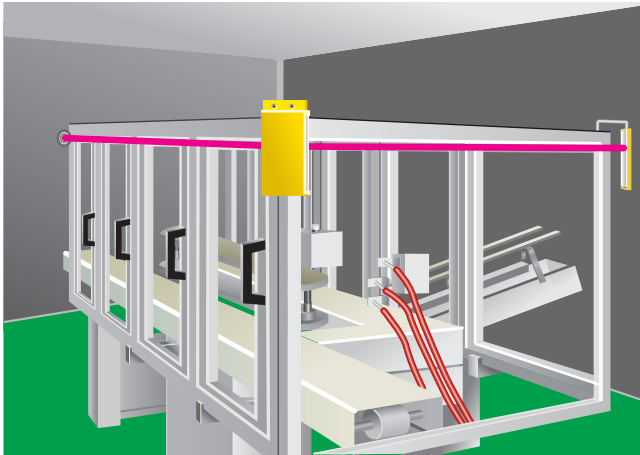
**BEF-2SMMEAAL2**  
Omega bracket, mounting kit for device columns



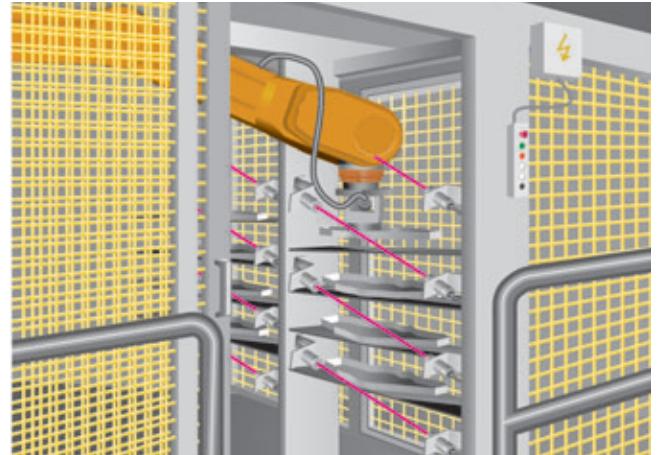
Dimensions in mm

## Single-beam photoelectric safety switches

Electro-sensitive access protection of hazardous areas with type 2 and type 4 single-beam photoelectric safety switches



Door monitoring on a packaging machine



Monitoring robot presence at a loading station

H

SICK's single-beam photoelectric safety switches consist either of testable senders and receivers, or of testable senders and receivers combined with an evaluation unit. These devices have an impressive scanning range and are offered in a variety of shapes and sizes. They also offer maximum safety performance as they comply with type 2 or type 4 in accordance with EN 61496 and PL c or PL e in accordance with EN ISO 13849. With products from SICK, you can solve a wide range of applications - whether it is for robots, processing machines, machining centers, palletizing systems, high-bay warehouses or transfer lines. SICK offers customer-friendly, high-quality solutions.

### Reduced inventory costs

Photoelectric safety switches can also be used for other automation applications. You only need to keep one type of through-beam photoelectric switch in stock and can thus reduce your costs.

### Safe in extreme environments

All single-beam photoelectric safety switches from SICK have an IP 67 enclosure rating and are well-equipped to withstand extreme conditions, such as heat (up to +60 °C), cold (to -40 °C) or humidity. SICK also provides solutions for changing ambient conditions and for use outdoors.

### Flexible technology that adapts as required

SICK photoelectric safety switches offer you more flexibility than ever before, such as a wide range of shapes, sizes and types and a choice of housing materials. Whether you need rectangular or cylindrical photoelectric switches, at SICK you will always find the right solution for your application.

### Impressive performance, optimum price

You will also benefit from an optimum price-performance ratio. SICK products are ideally matched to one another.

## Services for productive safety

With services tailored specifically to your needs, SICK offers complete support for the safety of your machine or system.

SICK addresses productivity and cost-effectiveness from the start: from selection and planning, through commissioning and inspection, to maintenance and modernization.

→ For information about the services, please refer to chapter B



Safety application	Type (IEC 61496)	Performance level (EN ISO 13849)	Number of sensors	Scanning range (m)	Ambient operating temperature (°C)	Construction size (mm), (H x W x D or Ø x L)	Functions				Product	Page	
							Muting	Restart interlock	External device monitoring	Front screen heating			
	Type 4	PL e	4 <sup>1)</sup>	0 ... 5	-40 ... +55	M18 x 108	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	—	L4000/L41	H-2	
				0 ... 10		M18 x 98							
				0 ... 60		M30 x 100							
	Type 4	PL e	8 <sup>2)</sup>	0 ... 5	-20 ... +55	M18 x 108	—	✓ <sup>2)</sup>	✓ <sup>2)</sup>	—	L4000 Systems	H-9	
						0 ... 10							M18 x 98
						0 ... 60							M30 x 100
Type 2	PL c	4 <sup>1)</sup>	1	0.5 ... 20	-25 ... +55	156 x 50 x 116	—	—	—	✓	WSU/WEU26-3	H-17	
				15 ... 70									
				0 ... 5									M18 x 108
Type 2	PL c	4 <sup>1)</sup>	0 ... 5	-40 ... +55	M18 x 108	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	—	L2000/L21	H-22		
					0 ... 16							M18 x 98	
					0 ... 60							M30 x 100	
Type 2	PL c	4 <sup>1)</sup>	0 ... 25/35 <sup>3)</sup>	-40 ... +60	80.6 x 24.6 x 54	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓ <sup>1)</sup>	✓	L2000/L27	H-29		
					0 ... 12/18 <sup>3)</sup>							-40 ... +60	75.5 x 17.6 x 33.5

<sup>1)</sup> With Flexi Classic/Flexi Soft

<sup>2)</sup> With UE401

<sup>3)</sup> Typical / maximum



- Compatible with safety controllers such as Flexi Classic, DeviceNet Safety products
- Inputs/outputs compliant with EN 61131
- Large scanning ranges
- Small design (M30/M18)
- Metal and plastic version
- Radial optics (90° deflector mirror)
- Simple diagnostics and service



## Technical data overview

Scanning range (depending on type)	0 m ... 5 m / 0 m ... 10 m / 0 m ... 60 m
Construction size (depending on type)	M18 / M30
Enclosure rating	IP 67
Ambient operating temperature from ... to	-40 °C ... +55 °C
Type	Type 4 (IEC 61496) <sup>1)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup>

<sup>1)</sup> Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

## Product description

The L41 single-beam photoelectric safety switch comprises a sender and a receiver. The function of the L41 can be checked with the aid of the test input on the sender. When connected to a suitable evaluation unit, such as Flexi Classic or DeviceNet Safety products, the L41 can achieve performance levels up to PL e in accordance with EN ISO 13849-1.

Color LEDs provide current information about operational status. The variety of device scanning ranges, suitability for outdoor applications, and the use of deflector mirrors enable more complex protection tasks.

## In-system added value

Combined with SICK safe control solutions

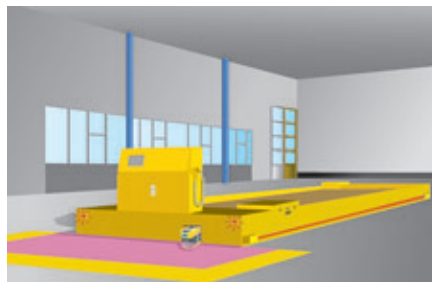
Combination with	Type of output	Type of output					Further information
		Number of sensors	Restart interlock	External device monitoring	Muting	Further information	
Flexi Classic main unit	PNP semiconductor, short-circuit protected, cross-circuit monitored	4	✓	✓	✓	0-2	
Flexi Classic extension unit		4	✓	✓	✓	0-2	
UE4470	Source output (PNP)	4	✓	✓	✓	P-17	
UE4457	Bipolar type	4	✓	✓	✓	P-32	

→ For more combinations, see annex

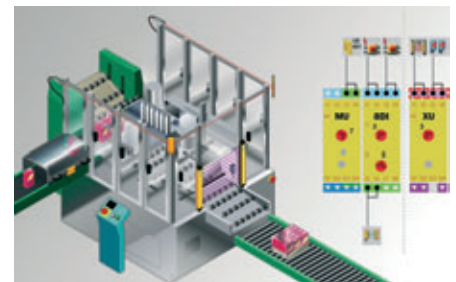
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Robots
- Processing machines
- Machining centers
- Palletizer systems
- High-bay warehouses



Lateral protection on an automated guided vehicle



Door monitoring on a packaging machine

Further information	Page
→ Technical specifications	H-4
→ Dimensional drawings	H-5
→ Connection diagrams	H-6
→ Accessories	H-7
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

- Construction size: M30, 100 mm
- Plug M12 x 4, angled

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 60 m	Axial	Metal	Sender	L41S-33MA2A	6034863
			Receiver	L41E-33MA2A	6034862

- Construction size: M18, 97.7 mm
- Plug M12 x 4, straight

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 10 m	Axial	Metal	Sender	L41S-21MA1A	6034866
			Receiver	L41E-21MA1A	6034867
		Plastic	Sender	L41S-21KA1A	6034864
			Receiver	L41E-21KA1A	6034865

- Construction size: M18, 107.7 mm
- Plug M12 x 4, straight

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 5 m	Radial	Metal	Sender	L41S-11MA1A	6034868
			Receiver	L41E-11MA1A	6034869

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Scanning range (depending on type)	0 m ... 10 m / 0 m ... 60 m (axial optic) 0 m ... 5 m (radial optic)	
Number of beams	1	
Optical axis (depending on type)	Axial / radial	
Aperture angle/receiving angle	According to type 4 (IEC 61496-2)	
Light sender/type of light	LED (visible red light)	-
Wave length	660 nm	-
Protection class	III	
Enclosure rating	IP 67	
Safety related parameters		
Type	Type 4 (IEC 61496) <sup>1)</sup>	
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup>	
Category	Category 4 (EN ISO 13849) <sup>1)</sup>	
Performance level	PL e (EN ISO 13849) <sup>1)</sup>	
PFHd (mean probability of a dangerous failure per hour)	8.1 x 10 <sup>-10</sup> (EN ISO 13849) <sup>1)</sup>	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Design	Cylindrical	
Dimensions (diameter x length) (depending on type)	M30 x 100 mm / M18 x 97.7 mm / M18 x 107.7 mm	
Housing material (depending on type)	Brass nickel-plated / plastic	
Lens material	Glass	
Ambient operating temperature from ... to	-40 °C ... +55 °C	
Storage temperature from ... to	-40 °C ... +55 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Vibration resistance	5 g, 10 Hz ... 55 Hz (IEC 60068-2-6)	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Weight (depending on type)	67 g / 30 g	

<sup>1)</sup> Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

### Electrical data

Connection type (depending on type)	Angled plug M12 x 4 / straight plug M12 x 4	
Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC)	
Maximum power consumption	20 mA	30 mA
Switching outputs	-	PNP, Q <sup>1)</sup>
Maximum response time	-	200 µs
Maximum switching current	-	70 mA

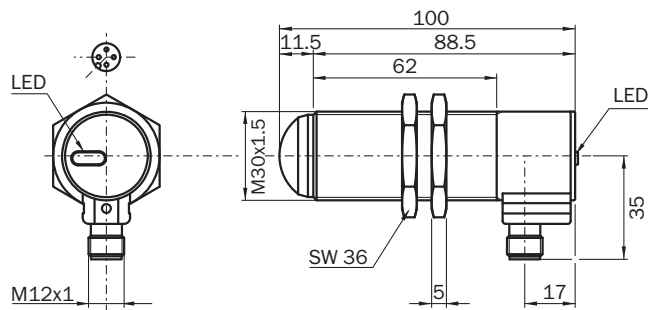
<sup>1)</sup> Short-circuit protected



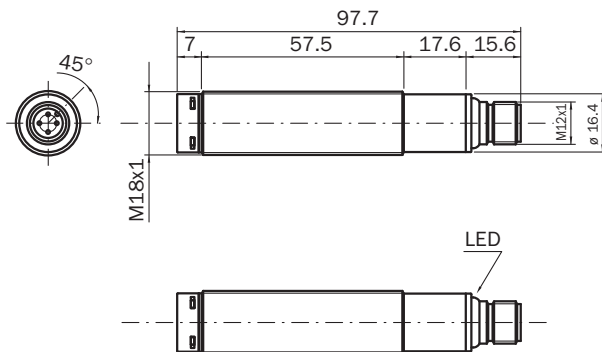


## Dimensional drawings

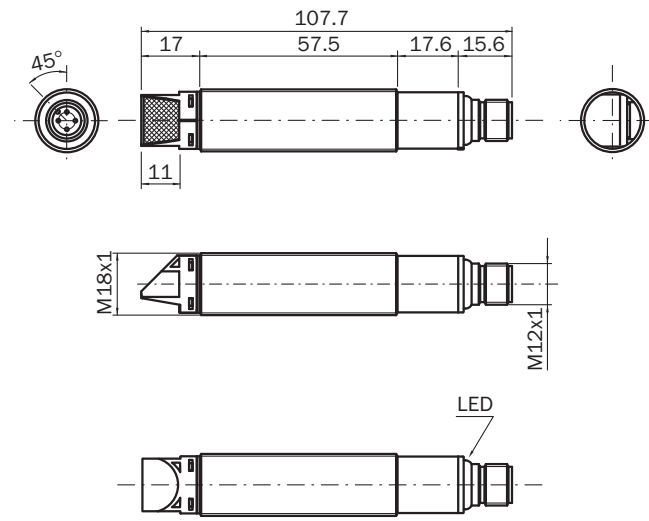
M30 axial



M18 axial



M18 radial



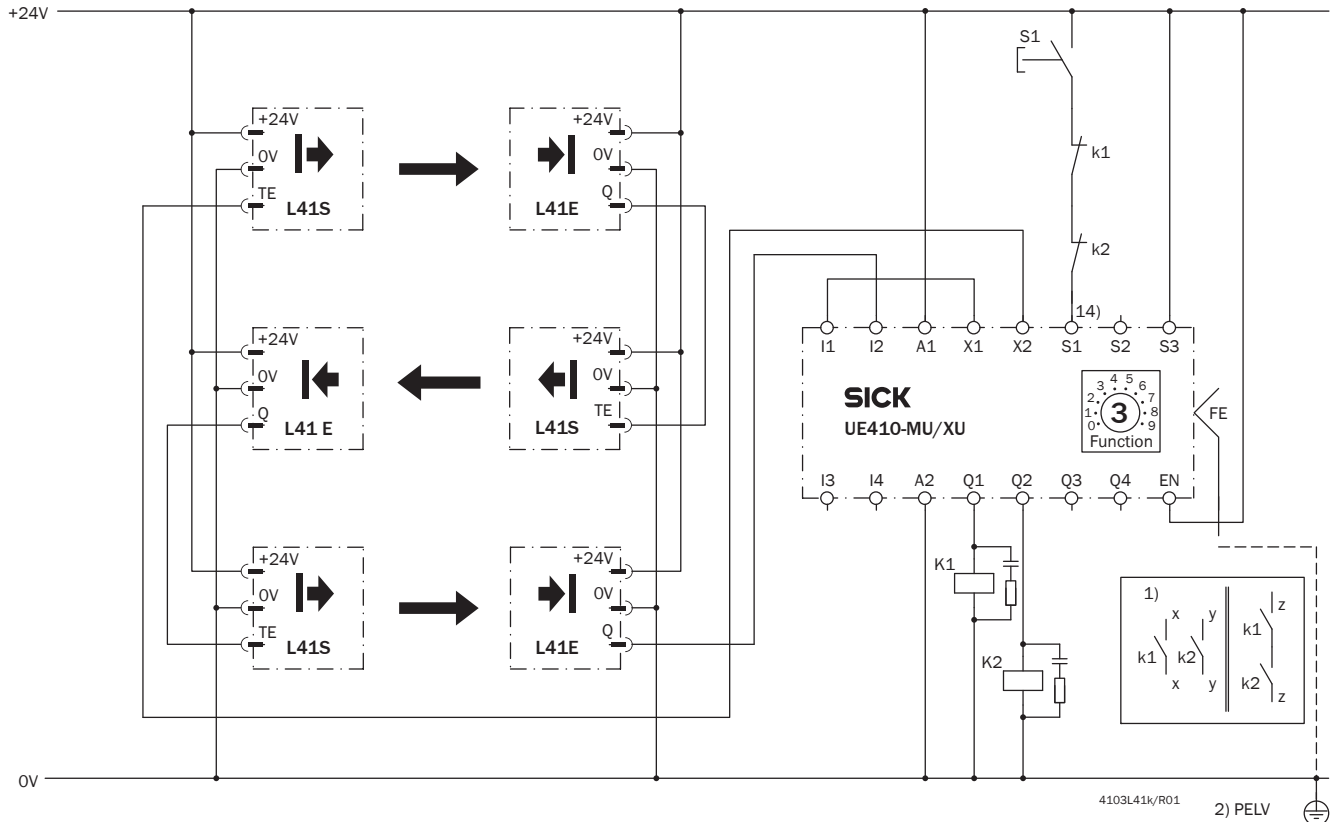
Dimensions in mm



## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### 3 x L41 (cascaded) on Flexi Classic main unit and extension unit



#### Task

Integration of three cascaded L4000 (L41) family single-beam photoelectric safety switches with a UE410-MU/XU safety controller into a relay controller/contactor controller.  
Operating mode: with restart interlock and with external device monitoring.

#### Function

When the input conditions are valid, the system is ready for switch-on and waits for an input signal/switch-on signal. The system is enabled by pressing and releasing the S1 button. The related output on the UE410-MU/XU carries power. If the input conditions are no longer met, the related outputs on the UE410-MU/XU shut down.

#### Possible faults

The incorrect function of the K1 and K2 contactors will be detected. The shutdown function is retained. On manipulation (e.g., jamming) of the S1 button, the system does not enable the output current circuits.

#### Comments

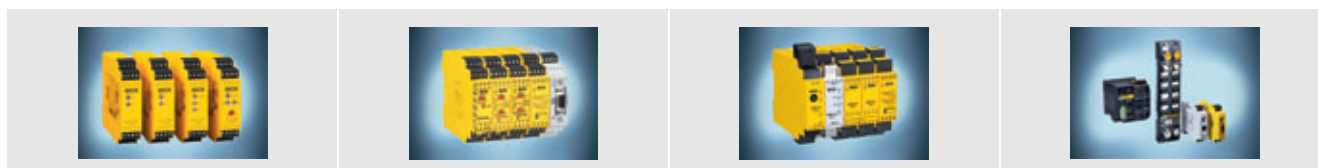
1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) PELV as required in EN 60204-1 / 6.4

Optical short-circuits must be avoided. Take note of the operating instructions for the integrated devices. The safety-related parameters (safety integrity level and response time) are dependent on the types used.

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## sens:Control – safe control solutions







Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



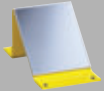
## Mounting systems

Figure	Construction size	Assembly	Property	Description	Type	Part no.
	–	–	Spring fastening	For PSK1	BEF-4AAAAHST3	2012473
	–	–	Fixing bracket	For PSK1	BEF-4GHAAHAL1	2009292
	M18	With fixing holes 4 mm	Adjustable	For L4000, L41, L21 (M18)	BEF-HA-M18R	5313513
		–	Mounting bracket	For L4000, L41, L21 (M18)	BEF-WN-M18	5308446
	M30	With tapering thread M6	Adjustable	For L4000, L41, L21 (M30)	BEF-HA-M30A	5311527
		With fixing holes for M4	Adjustable	For L4000, L41, L21 (M30)	BEF-HA-M30R	5311528
		–	Mounting bracket	For L4000, L41, L21 (M30)	BEF-WN-M30	5308445

## Connectors



Figure	Connection type	Designation	Direction of cable outlet	Cable length	Cable material	Type	Part no.
	M12 x 4	Male connector	Straight	–	–	STE-1204-G	6009932
			Straight	–	–	DOS-1204-G	6007302
			Angled	–	–	DOS-1204-W	6007303
	M12 x 4	Female connector	Straight	2 m	PVC	DOL-1204-G02M	6009382
				5 m	PVC	DOL-1204-G05M	6009866
					PUR halogen free	DOL-1204-G05MC	6025901
			10 m	PVC	DOL-1204-G10M	6010543	
			Angled	2 m	PVC	DOL-1204-W02M	6009383
				5 m	PVC	DOL-1204-W05M	6009867
		PUR halogen free		DOL-1204-W05MC	6025904		
	10 m	PVC	DOL-1204-W10M	6010541			

**Deflector mirrors <sup>1)</sup>**

Figure	Mirror surface	Description	Type	Part no.
	75 mm x 80 mm	Including mounting adapter (two-piece swivel mount)	PNS75-008	1026647
	96 mm x 124 mm	-	PSK1	1005229
	80 mm x 97 mm	For 90° deflection, incl. mounting set; not suitable for column mounting	PSK45	5306053

<sup>1)</sup> Reduction of the scanning range

**Laser alignment aid**

Figure	Remark	Type	Part no.
	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	Laser alignment aid - AR60	1015741
	-	AR60 adapter for L4000 and L21 (M30)	5311529
	-	AR60 adapter for L4000 and L21 (M18)	5313533

H

## Technical data overview

Scanning range (depending on type)	0 m ... 5 m / 0 m ... 10 m / 0 m ... 60 m
Construction size (depending on type)	M18 / M30
Enclosure rating	IP 67
Ambient operating temperature from ... to	-20 °C ... +55 °C
Type	Type 4 (IEC 61496) <sup>1)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup>

<sup>1)</sup> Only in conjunction with UE401

## Product description

The L4000 photoelectric safety switch system comprises the UE401 safety evaluation unit, to which up to four L4000/L400 sensors (sender/receiver combinations) can be connected as single pairs or up to 8 sensors can be connected in cascade. The UE401 safety evaluation device is the link between sensors and machine controller.

Color LEDs provide current information about operational status. The indication of status and error messages on the 7-segment display of the UE401 safety evaluation unit allows rapid diagnostics. The ability to connect sensors or sensor pairs, the range of versions, and deflector mirrors make the L4000 system ideal for complex protection applications – even outdoors.

## In-system added value

Combined with SICK safe control solutions

Combination with	Number of enable current contacts	Number of signaling current contacts	Further information
UE10-30S	3	1	N-63

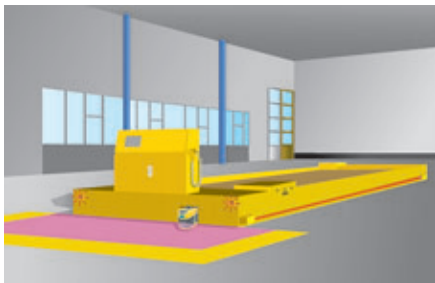
→ For more combinations, see annex

## Applications

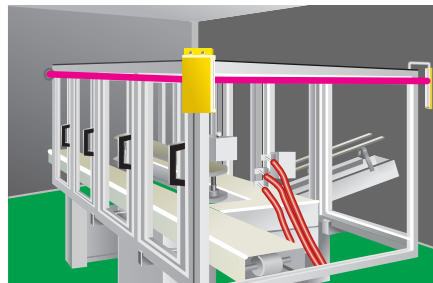
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Robots
- Processing machines
- Machining centers

- Palletizer systems
- High-bay warehouses
- Transfer lines



Lateral protection on an automated guided vehicle



Door monitoring on a packaging machine



- Restart interlock (RES)
- External device monitoring (EDM)
- Maximum 8 sensor pairs
- Simple alignment
- Simple diagnostics and service



Further information	Page
→ Ordering information	H-10
→ Technical specifications	H-11
→ Dimensional drawings	H-13
→ Connection diagrams	H-14
→ Accessories	H-15
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### Sensors

- Construction size: M30, 100 mm
- Plug M12 x 4, angled

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 60 m	Axial	Metal	Sender	L40S-33MA2A	6027335
			Receiver	L40E-33MA2A	6027336

- Construction size: M18, 97.7 mm
- Plug M12 x 4, straight

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 10 m	Axial	Plastic	Sender	L40S-21KA1A	6027337
			Receiver	L40E-21KA1A	6027338
		Metal	Sender	L40S-21MA1A	6027339
			Receiver	L40E-21MA1A	6027340

- Construction size: M18, 107.7 mm
- Plug M12 x 4, straight

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 5 m	Radial	Metal	Sender	L40S-11MA1A	6027341
			Receiver	L40E-11MA1A	6027342

### UE401 evaluation unit

Type	Part no.
UE401-A0010	6027343

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### L4000 Systems, general data

Type	L40S-33MA2A Sender	L40E-33MA2A Receiver	L40S-21KA1A Sender	L40E-21KA1A Receiver	L40S-21MA1A Sender	L40E-21MA1A Receiver	L40S-11MA1A Sender	L40E-11MA1A Receiver												
Scanning range	0 m ... 60 m		0 m ... 10 m				0 m ... 5 m													
Number of beams	1																			
Optical axis	Axial						Radial													
Aperture angle/receiving angle	According to type 4 (IEC 61496-2)																			
Light sender/type of light	LED (visible red light)	-	LED (visible red light)	-	LED (visible red light)	-	LED (visible red light)	-												
Wave length	660 nm	-	660 nm	-	660 nm	-	660 nm	-												
Protection class	III																			
Enclosure rating	IP 67																			
Safety related parameters	<table border="0"> <tr> <td>Type</td> <td>Type 4 (IEC 61496) <sup>1)</sup></td> </tr> <tr> <td>Safety integrity level</td> <td>SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup></td> </tr> <tr> <td>Category</td> <td>Category 4 (EN ISO 13849) <sup>1)</sup></td> </tr> <tr> <td>Performance level</td> <td>PL e (EN ISO 13849) <sup>1)</sup></td> </tr> <tr> <td>PFHd (mean probability of a dangerous failure per hour)</td> <td><math>2.9 \times 10^{-10}</math> (EN ISO 13849) <sup>1)</sup></td> </tr> <tr> <td>T<sub>M</sub> (Mission Time)</td> <td>20 years (EN ISO 13849)</td> </tr> </table>								Type	Type 4 (IEC 61496) <sup>1)</sup>	Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup>	Category	Category 4 (EN ISO 13849) <sup>1)</sup>	Performance level	PL e (EN ISO 13849) <sup>1)</sup>	PFHd (mean probability of a dangerous failure per hour)	$2.9 \times 10^{-10}$ (EN ISO 13849) <sup>1)</sup>	T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Type	Type 4 (IEC 61496) <sup>1)</sup>																			
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Performance level	PL e (EN ISO 13849) <sup>1)</sup>																			
PFHd (mean probability of a dangerous failure per hour)	$2.9 \times 10^{-10}$ (EN ISO 13849) <sup>1)</sup>																			
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)																			
Design	Cylindrical																			
Dimensions (diameter x length)	M30 x 100 mm		M18 x 97.7 mm				M18 x 107.7 mm													
Housing material	Brass nickel-plated		Plastic		Brass nickel-plated															
Lens material	Glass																			
Ambient operating temperature from ... to	-20 °C ... +55 °C																			
Storage temperature from ... to	-25 °C ... +75 °C																			
Air humidity from ... to	15 % ... 95 %, non-condensing																			
Vibration resistance	5 g, 10 Hz ... 55 Hz (IEC 60068-2-6)																			
Shock resistance	10 g, 16 ms (IEC 60068-2-29)																			
Weight	212 g		30 g		67 g															

<sup>1)</sup> Only in conjunction with UE401

### Electrical data

Connection type	Plug M12 x 4							
Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC)							
Maximum power consumption	60 mA	30 mA	60 mA	30 mA	60 mA	30 mA	60 mA	30 mA

## UE401 evaluation unit

## General data

Number of single-beam photoelectric safety switches from ... to	Sensor pairs 1 ... 8
Safety related parameters	
Type	Type 4 (IEC 61496) <sup>1)</sup>
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup>
Category	Category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup>
PFHd (mean probability of a dangerous failure per hour)	$2.9 \times 10^{-10}$ (EN ISO 13849) <sup>1)</sup>
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849) <sup>1)</sup>
Maximum response time	30 ms
Protection class	III
Enclosure rating	IP 20
Ambient operating temperature from ... to	-20 °C ... +55 °C
Air humidity from ... to	15 % ... 95 %, non-condensing
Storage temperature from ... to	-25 °C ... +75 °C
Vibration resistance	5 g, 10 Hz ... 55 Hz (IEC 60068-2-6)
Shock resistance	10 g, 16 ms (IEC 60068-2-29)
Weight	160 g
Assembly	Snap-on mounting on top-hat rail acc. to IEC 60715

<sup>1)</sup> Only in conjunction with L40 sensors

## Electrical data

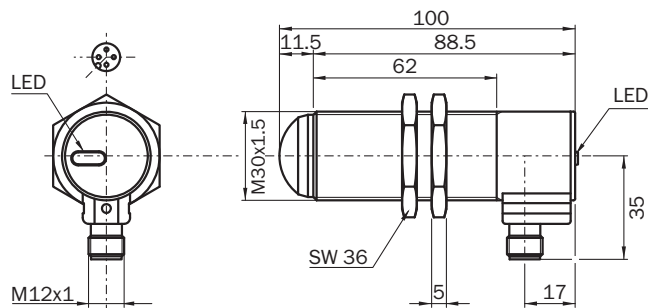
Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC)
Power consumption	< 3.6 W
Safety outputs	2, PNP semiconductors, short-circuit protected, cross-circuit monitored
Switching voltage HIGH	24 V DC (17.5 V DC ... 28.8 V DC)
Maximum switching voltage LOW	1.3 V DC
Switching current	0.5 A
Connection type	Interchangeable, coded screw-type terminals
Cable length	Max. 100 m
Conductor cross-section	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>



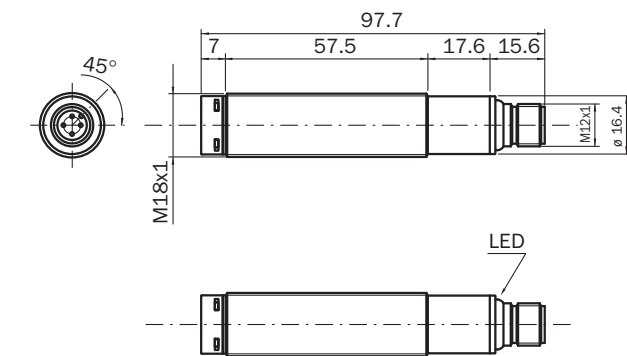


# Dimensional drawings

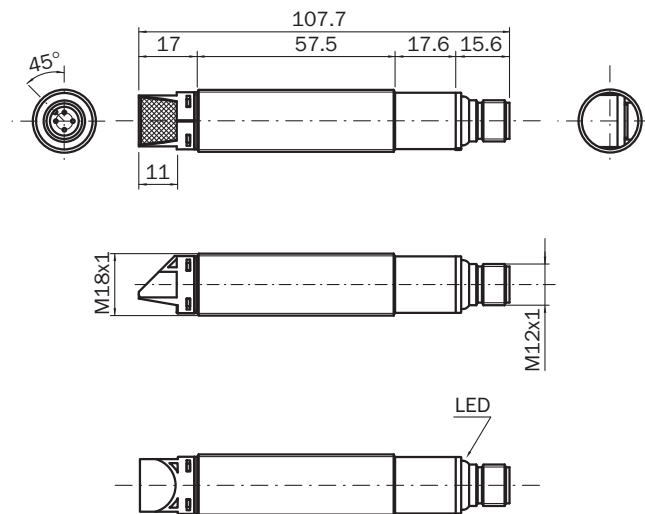
## M30 axial



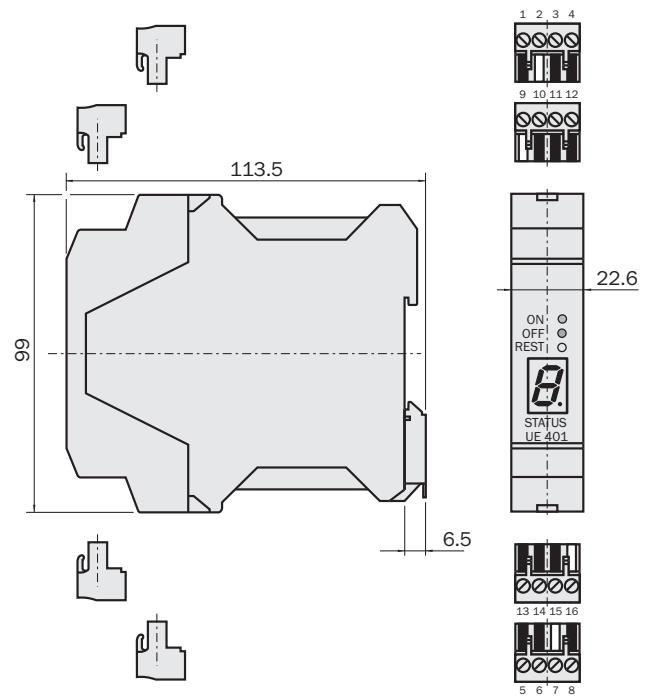
## M18 axial



## M18 radial



## UE401 evaluation unit

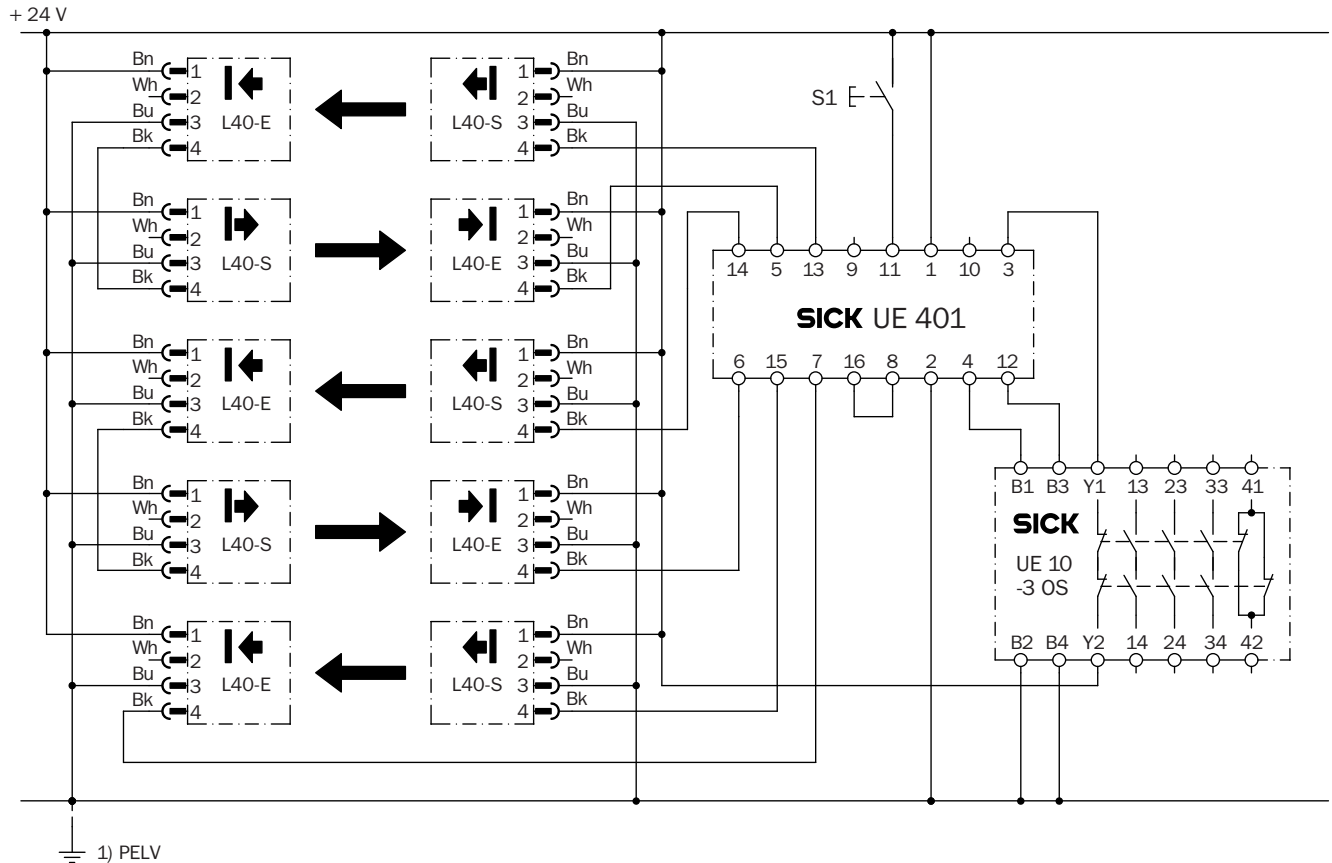


Dimensions in mm

# Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## 5 x L4000 (two pairs cascaded) on UE401 with UE10-30S



### Task

Integrate five single-beam L400/L4000 photoelectric safety switches (2 pairs cascaded) with a UE401 safety evaluation device and a UE10-30S safety relay. Operating mode: with restart interlock and external device monitoring.

### Function

When the light path is clear and the UE10 is de-energized and functioning correctly, the yellow LED on the UE401 flashes. The system is ready to be switched on. The system is ready to be switched and is enabled when the S1 button is pressed and released. OSSD1 and OSSD2 outputs are then live and the UE10 is switched on. If one of the light beams is interrupted, the UE10 is deactivated as the OSSD1 and OSSD2 output signals drop out.

### Possible faults

OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The incorrect functioning of the UE10 will be detected and will not result in the loss of the shutdown function. Jamming of the S1 button prevents output circuit to enable.

### Comments

<sup>1)</sup> PELV as required in EN 60204-1 / 6.4

The related operating instructions for the integrated devices must be observed!

## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



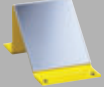
## Mounting systems

Figure	Construction size	Assembly	Property	Description	Type	Part no.
	–	–	Spring fastening	For PSK1	BEF-4AAAAHST3	2012473
	–	–	Fixing bracket	For PSK1	BEF-4GHAAHAL1	2009292
	M18	With fixing holes 4 mm	Adjustable	For L4000, L41, L21 (M18)	BEF-HA-M18R	5313513
		–	Mounting bracket	For L4000, L41, L21 (M18)	BEF-WN-M18	5308446
	M30	With tapering thread M6	Adjustable	For L4000, L41, L21 (M30)	BEF-HA-M30A	5311527
		With fixing holes for M4	Adjustable	For L4000, L41, L21 (M30)	BEF-HA-M30R	5311528
		–	Mounting bracket	For L4000, L41, L21 (M30)	BEF-WN-M30	5308445

## Connectors



Figure	Connection type	Designation	Direction of cable outlet	Cable length	Cable material	Type	Part no.
	M12 x 4	Male connector	Straight	–	–	STE-1204-G	6009932
			Straight	–	–	DOS-1204-G	6007302
			Angled	–	–	DOS-1204-W	6007303
	M12 x 4	Female connector	Straight	2 m	PVC	DOL-1204-G02M	6009382
				5 m	PVC	DOL-1204-G05M	6009866
					PUR halogen free	DOL-1204-G05MC	6025901
			10 m	PVC	DOL-1204-G10M	6010543	
			Angled	2 m	PVC	DOL-1204-W02M	6009383
				5 m	PVC	DOL-1204-W05M	6009867
		PUR halogen free		DOL-1204-W05MC	6025904		
	10 m	PVC	DOL-1204-W10M	6010541			

**Deflector mirrors <sup>1)</sup>**

Figure	Mirror surface	Description	Type	Part no.
	75 mm x 80 mm	Including mounting adapter (two-piece swivel mount)	PNS75-008	1026647
	96 mm x 124 mm	-	PSK1	1005229
	80 mm x 97 mm	For 90° deflection, incl. mounting set; not suitable for column mounting	PSK45	5306053

<sup>1)</sup> Reduction of the scanning range

**Laser alignment aid**

Figure	Remark	Type	Part no.
	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	Laser alignment aid - AR60	1015741
	-	AR60 adapter for L4000 and L21 (M30)	5311529
	-	AR60 adapter for L4000 and L21 (M18)	5313533

H

## Technical data overview

Scanning range (depending on type)	0.5 m ... 20 m / 15 m ... 70 m
Light sender/type of light	Infrared light
Construction size	156 mm x 50 mm x 116 mm
Supply voltage	24 V DC
Enclosure rating	IP 67
Ambient operating temperature from ... to	-25 °C ... +55 °C
Type	Type 4 (IEC 61496)
Performance level	PL e (EN ISO 13849)

## Product description

The WSU/WEU26-3 photoelectric safety switch is used for access protection of hazardous areas on machines or in plants. The devices are permanently mounted in the access area at the necessary safety dis-

tance from the nearest hazardous point and send a shutdown signal to the machine or system when the light beam is interrupted.

## In-system added value

Combined with SICK safe control solutions

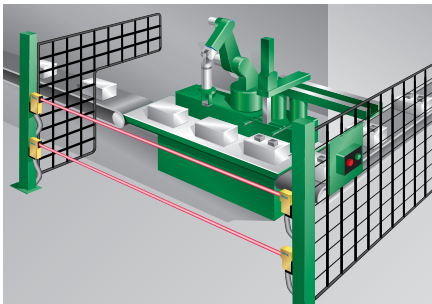
→ For more combinations, see annex

## Applications

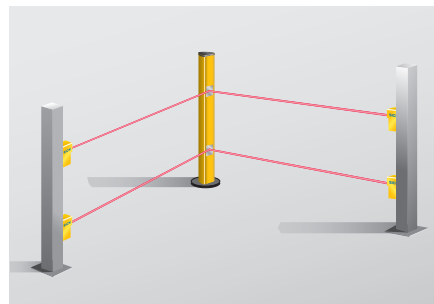
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Robots
- Processing machines
- Machining centers

- Palletizer systems
- High-bay warehouses
- Transfer lines



Access protection in a machining center



Access protection with mirror deflection



- Universal application
- Relay outputs
- Robust design
- Large scanning range
- Front screen heating



H

Further information	Page
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→ Technical specifications	H-18
→ Dimensional drawings	H-19
→ Connection diagrams	H-20
→ Accessories	H-20
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

- Supply voltage: 24 V DC
- Connection type: PG gland
- Enclosure rating: IP 67

Scanning range	Sender		Receiver	
	Type	Part no.	Type	Part no.
0.5 m ... 20 m	WSU26/3-103A00	1047984	WEU26/3-103A00	1047985
15 m ... 70 m	WSU26/3-103A00	1047984	WEU26/3-203A00	1048379

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Scanning range (depending on type)	-	0.5 m ... 20 m / 15 m ... 70 m
Number of beams	1	
Synchronization	Optical, without separate synchronization cable	
Detection capability	30 mm	
Wave length	950 nm	-
Protection class	I (EN 50178:1998) <sup>1)</sup>	
Enclosure rating	IP 67 (EN 60529)	
Safety related parameters		
Type	Type 4 (IEC 61496)	
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
B <sub>10d</sub> parameter	1 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, 0.4 A) 2.6 x 10 <sup>5</sup> switching cycles (AC-15, 230 V, 2.0 A) 1 x 10 <sup>6</sup> switching cycles (DC-13, 24 V, 0.6 A) 2 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, 1.5 A)	
PFHd (mean probability of a dangerous failure per hour)	4.0 x 10 <sup>-9</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Dimensions (W x H x D)	156 mm x 50 mm x 116 mm	
Housing material	Aluminum diecast	
Ambient operating temperature from ... to	-25 °C ... +55 °C	
Storage temperature from ... to	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Vibration resistance	5 g, 10 Hz ... 55 Hz (IEC 60068-2-6)	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Weight	1 kg	
Front screen heating	✓	

<sup>1)</sup> Requires safety extra-low voltage SELV/PELV



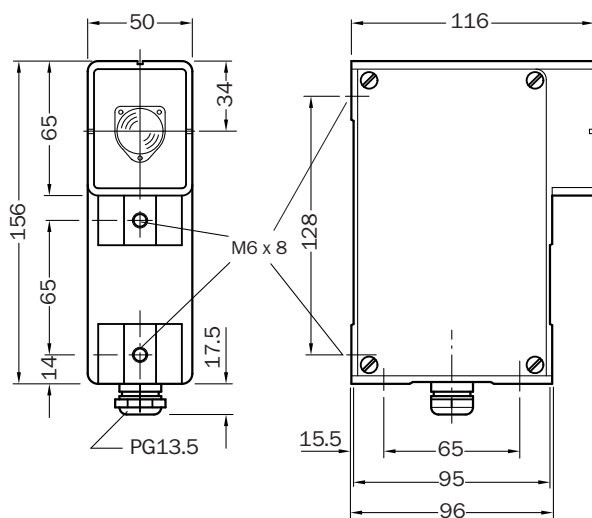
## Electrical data

System part	Sender	Receiver
Connection type	PG gland	
Supply voltage $V_s$	24 V DC (19.2 V DC ... 28.8 V DC) <sup>1)</sup>	
Maximum power consumption	6 W	8 W
Switch-on time	Max. 10 s <sup>2)</sup>	
Test input	Volt-free N/C contact	-
Switching outputs	-	Relay
Contact material	-	Ag alloy with Au coating
Maximum response time	-	22 ms
Switching current	-	0.02 A ... 2 A
Switching voltage	-	10 V DC ... 30 V DC
	-	10 V AC ... 230 V AC
Usage category in compliance with IEC/EN 60947-5-1	-	AC-15/DC-13
Mechanical life (relay contacts)	-	$\geq 1 \times 10^7$ switching cycles

<sup>1)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1. Suitable power supplies are available as accessories from SICK.

<sup>2)</sup> After applying the supply voltage to sender and receiver

## Dimensional drawings



Dimensions in mm

H

## Connection diagrams

→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)

## sens:Control – safe control solutions




Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



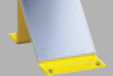
### Mounting systems

Property	Description	Type	Part no.
Spring fastening	For PSK1	BEF-4AAAAHST3	2012473
Fixing bracket	For PSK1	BEF-4GHAAHAL1	2009292
Mounting bracket	For WSU/WEU26/2, WSU/WEU26-3	BEF-4WNAEFAL1	2007900

### Power supply units

Figure	Input voltage	Output voltage	Output current	Part no.
	100 V AC ... 240 V AC	24 V DC	Max. 2.1 A	7028789
			Max. 3.9 A	7028790


### Deflector mirrors <sup>1)</sup>

Figure	Mirror surface	Deflection angle	Description	Type	Part no.
	75 mm x 80 mm	–	Including mounting adapter (two-piece swivel mount)	PNS75-008	1026647
	96 mm x 124 mm	–	–	PSK1	1005229
	80 mm x 97 mm	90°	For 90° deflection, incl. mounting set; not suitable for column mounting	PSK45	5306053

<sup>1)</sup> Reduction of the scanning range



**Laser alignment aid**

Figure	Remark	Type	Part no.
	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	Laser alignment aid AR60	1015741
	-	Adapter AR60 for WSU/WEU26/2, WSU/WEU26-3	4031156

**Device protection**

Figure	Designation	Type	Part no.
	Test rod holder	BEF-3WNAAAAL1	2052249
	30 mm diameter	Test rod	2022602
	-	Snow protection tube	1003619
	-	Dust protection tube	1003556

**PG expansion**

Construction size	Type	Part no.
PG13/21	PG expansion	5307052
PG21	Two-way splitter	5305978

**Arc-suppressor**

Designation	Type	Part no.
0.22 µF/220 Ohm for 110 V AC ... 220 V AC	RC-A	6001224
2.2 µF/100 Ohm for 24 V AC/DC ... 48 V AC/DC	RC-AD	6001225



- Compatible with safety controllers such as Flexi Classic and DeviceNet Safety products
- Inputs/outputs compliant with EN 61131
- Large scanning ranges
- Small design (M30/M18)
- Metal and plastic version
- Radial optics (90° deflector mirror)
- Simple diagnostics and service



H

Further information	Page
→ Technical specifications	H-24
→ Dimensional drawings	H-25
→ Connection diagrams	H-26
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→ Systematic safety	A-0
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## Technical data overview

Scanning range (depending on type)	0 m ... 5 m / 0 m ... 16 m / 0 m ... 60 m
Construction size (depending on type)	M18 / M30
Enclosure rating	IP 67
Ambient operating temperature from ... to	-40 °C ... +55 °C
Type	Type 2 (EN 61496) <sup>1)</sup>
Performance level	PL c (EN ISO 13849) <sup>1)</sup>

<sup>1)</sup> Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

## Product description

The L21 single-beam photoelectric safety switch comprises a sender and a receiver. The function of the L21 can be checked with the aid of the test input on the sender. When connected to a suitable evaluation unit, such as the Flexi Classic and DeviceNet Safety products, the L21 can achieve performance levels up to PL c in accordance with EN ISO 13849-1.

Color LEDs provide current information about operational status. The variety of device scanning ranges, suitability for outdoor applications, and the use of deflector mirrors enable more complex protection tasks.

## In-system added value

Combined with SICK safe control solutions

Combination with	Type of output	Number of sensors	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic main unit	PNP semiconductor, short-circuit protected, cross-circuit monitored	4	✓	✓	✓	0-2
Flexi Classic extension unit		4	✓	✓	✓	0-2
UE4470	Source output (PNP)	4	✓	✓	✓	P-17
UE4457	Bipolar type	4	✓	✓	✓	P-32

→ For more combinations, see annex

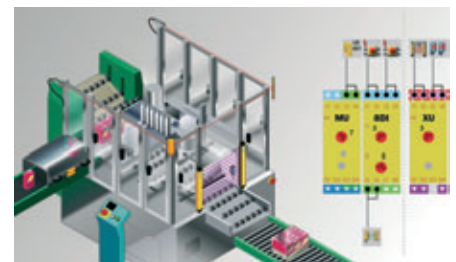
## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Robots
- Processing machines
- Machining centers
- Palletizer systems
- High-bay warehouses



Lateral protection on an automated guided vehicle



Door monitoring on a packaging machine

## Ordering information

- Construction size: M30, 100 mm
- Plug M12 x 4, angled

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 60 m	Axial	Metal	Sender	L21S-33MA2A	6034870
			Receiver	L21E-33MA2A	6034871

- Construction size: M18, 97.7 mm
- Plug M12 x 4, straight

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 16 m	Axial	Metal	Sender	L21S-21MA1A	6034874
			Receiver	L21E-21MA1A	6034875
		Plastic	Sender	L21S-21KA1A	6034872
			Receiver	L21E-21KA1A	6034873

- Construction size: M18, 107.7 mm
- Plug M12 x 4, straight

Scanning range	Optical axis	Housing material	System part	Type	Part no.
0 m ... 5 m	Radial	Metal	Sender	L21S-11MA1A	6034876
			Receiver	L21E-11MA1A	6034877

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Scanning range (depending on type)	0 m ... 16 m / 0 m ... 60 m (axial optic) 0 m ... 5 m (radial optic)	
Number of beams	1	
Optical axis (depending on type)	Axial / radial	
Aperture angle/receiving angle	According to type 4 (IEC 61496-2)	
Light sender/type of light	LED (visible red light)	-
Wave length	660 nm	-
Protection class	III	
Enclosure rating	IP 67	
Safety related parameters		
Type	Type 2 (EN 61496) <sup>1)</sup>	
Safety integrity level	SIL1 (IEC 61508), SILCL1 (IEC 62061) <sup>1)</sup>	
Category	Category 2 (EN ISO 13849) <sup>1)</sup>	
Test rate (external test)	100/s (EN ISO 13849) <sup>2)</sup>	
Maximum demand rate	60/min (EN ISO 13849) <sup>3)</sup>	
Performance level	PL c (EN ISO 13849) <sup>1)</sup>	
PFHd (mean probability of a dangerous failure per hour)	1.0 x 10 <sup>-6</sup> (EN ISO 13849) <sup>1)</sup>	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Design	Cylindrical	
Dimensions (diameter x length) (depending on type)	M30 x 100 mm / M18 x 97.7 mm / M18 x 107.7 mm	
Housing material (depending on type)	Brass nickel-plated / plastic	
Ambient operating temperature from ... to	-40 °C ... +55 °C	
Storage temperature from ... to	-40 °C ... +75 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Vibration resistance	5 g, 10 Hz ... 55 Hz (IEC 60068-2-6)	
Shock resistance	10 g, 16 ms (IEC 60068-2-29)	
Weight (depending on type)	67 g / 30 g	

<sup>1)</sup> Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

<sup>2)</sup> The test rate shall not be exceeded

<sup>3)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

### Electrical data

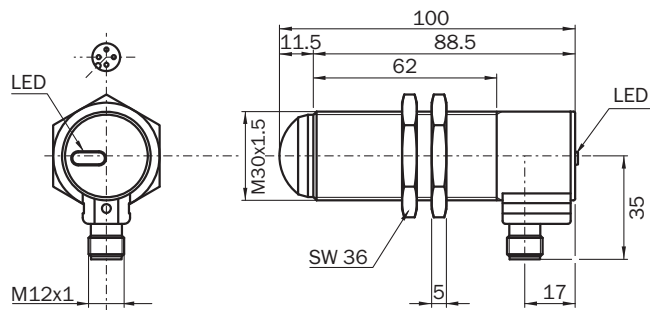
Connection type (depending on type)	Angled plug M12 x 4 / straight plug M12 x 4	
Supply voltage V <sub>s</sub>	24 V DC (19.2 V DC ... 28.8 V DC)	
Maximum power consumption	20 mA	30 mA
Switching outputs	-	PNP, Q <sup>1)</sup>
Maximum response time	-	200 µs
Maximum switching current	-	70 mA

<sup>1)</sup> Short-circuit protected

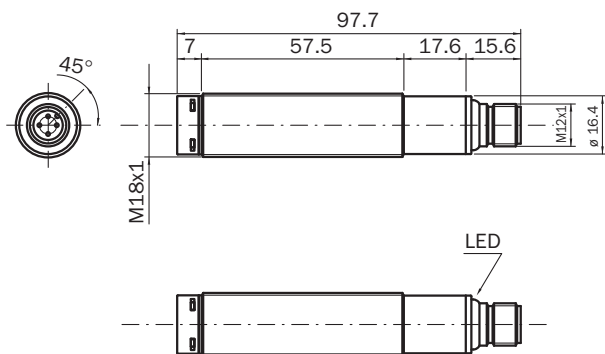
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## Dimensional drawings

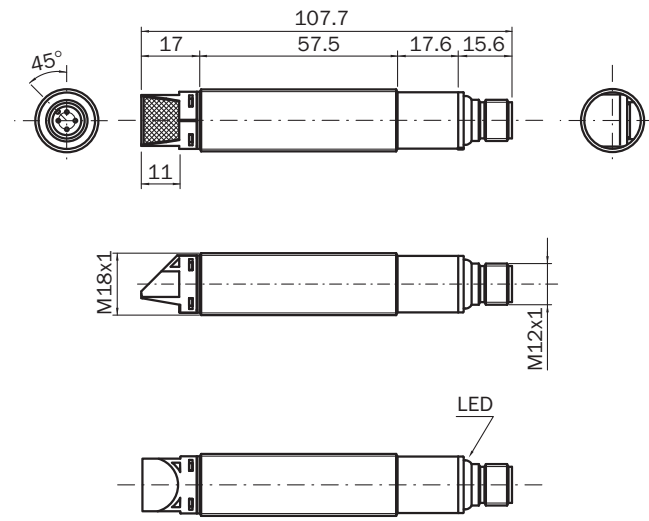
M30 axial



M18 axial



M18 radial



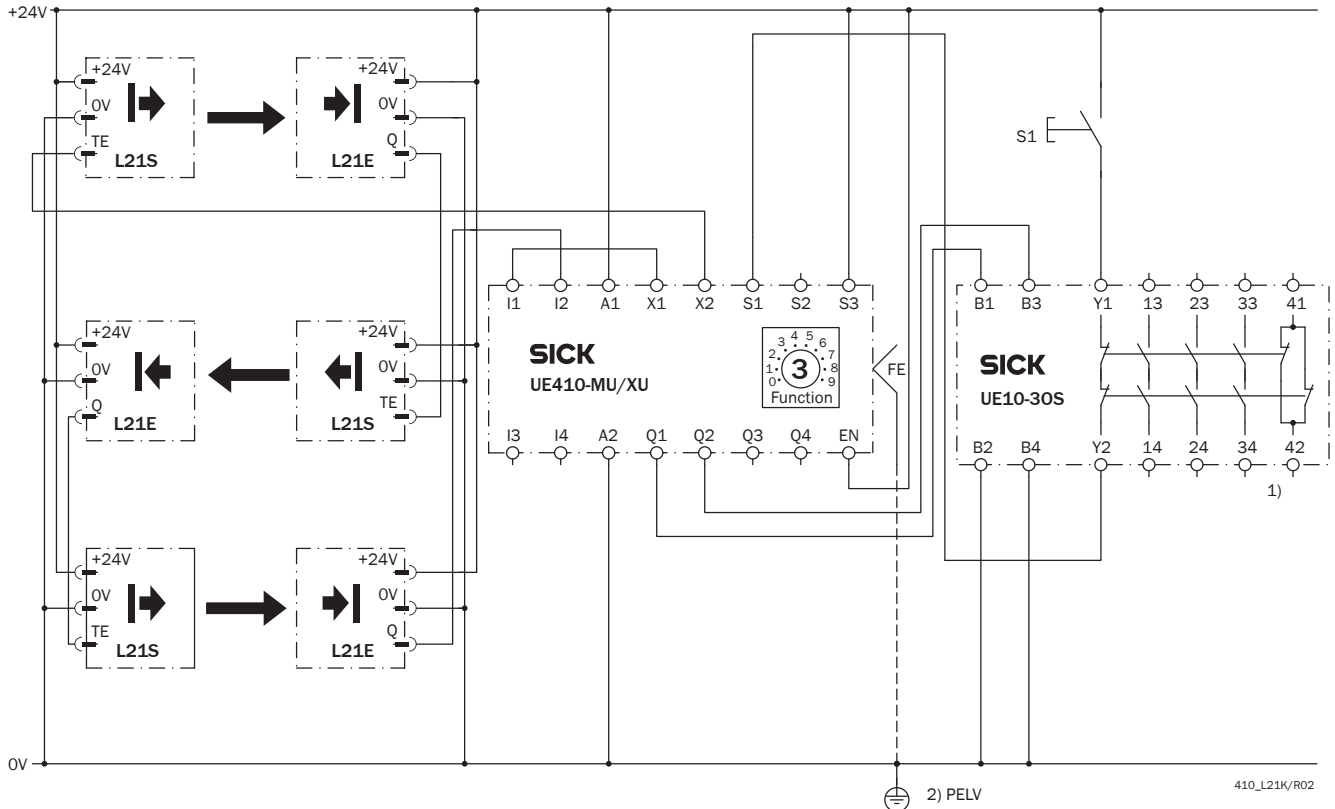
Dimensions in mm



## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### 3 x L21 (cascaded) with Flexi Classic main unit and extension unit on UE10-30S



#### Task

Integration of three cascaded L2000 (L21) family single-beam photoelectric safety switches with a UE410-MU/XU safety controller and a UE10-30S safety relay.

Operating mode: with restart interlock and external device monitoring.

#### Function

The system is ready when the light path is clear and the UE10-30S is de-energized and functioning correctly. When the S1 button is pressed and released, the Q1 and Q2 outputs on the UE410-MU/XU are live and the UE10-30S is switched on. If one of the light beams is interrupted, the Q1 and Q2 outputs on the UE410-MU/XU shut down the UE10-30S.

#### Possible faults

Malfunctions in the UE10-30S will be detected. The shutdown function is retained.

#### Comments

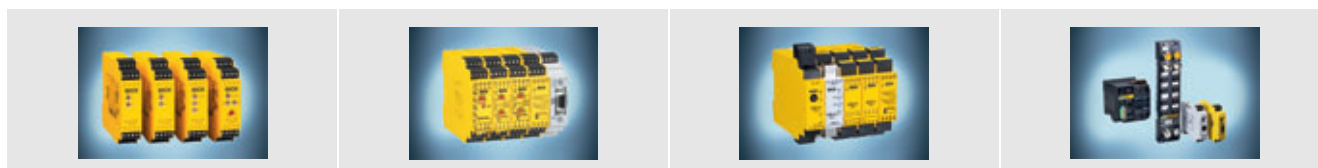
1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel control and by taking the risk analysis into account.

2) PELV as required in EN 60204-1 / 6.4

Take note of the operating instructions for the integrated devices. The safety-related parameters (safety integrity level and response time) are dependent on the types used.

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## sens:Control – safe control solutions



Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories



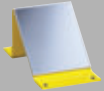
## Mounting systems

Figure	Construction size	Assembly	Property	Description	Type	Part no.
	-	-	Spring fastening	For PSK1	BEF-4AAAAHST3	2012473
	-	-	Fixing bracket	For PSK1	BEF-4GHAHAL1	2009292
	M18	With fixing holes 4 mm	Adjustable	For L4000, L41, L21 (M18)	BEF-HA-M18R	5313513
		-	Mounting bracket	For L4000, L41, L21 (M18)	BEF-WN-M18	5308446
	M30	With tapering thread M6	Adjustable	For L4000, L41, L21 (M30)	BEF-HA-M30A	5311527
		With fixing holes for M4	Adjustable	For L4000, L41, L21 (M30)	BEF-HA-M30R	5311528
		-	Mounting bracket	For L4000, L41, L21 (M30)	BEF-WN-M30	5308445

## Connectors



Figure	Connection type	Designation	Direction of cable outlet	Cable length	Cable material	Type	Part no.		
	M12 x 4	Male connector	Straight	-	-	STE-1204-G	6009932		
		Female connector	Straight	-	-	DOS-1204-G	6007302		
			Angled	-	-	DOS-1204-W	6007303		
	Straight		2 m	PVC	DOL-1204-G02M	6009382			
					5 m	PVC	DOL-1204-G05M	6009866	
						PUR halogen free	DOL-1204-G05MC	6025901	
	Angled		10 m	PVC	DOL-1204-G10M	6010543			
		2 m			PVC	DOL-1204-W02M	6009383		
						5 m	PVC	DOL-1204-W05M	6009867
							PUR halogen free	DOL-1204-W05MC	6025904
10 m	PVC	DOL-1204-W10M	6010541						

**Deflector mirrors <sup>1)</sup>**

Figure	Mirror surface	Description	Type	Part no.
	75 mm x 80 mm	Including mounting adapter (two-piece swivel mount)	PNS75-008	1026647
	96 mm x 124 mm	-	PSK1	1005229
	80 mm x 97 mm	For 90° deflection, incl. mounting set; not suitable for column mounting	PSK45	5306053

<sup>1)</sup> Reduction of the scanning range

**Laser alignment aid**

Figure	Remark	Type	Part no.
	Visible red light, laser class 2 (IEC 60825): Do not stare into beam!	Laser alignment aid AR60	1015741
	-	AR60 adapter for L4000 and L21 (M30)	5311529
	-	AR60 adapter for L4000 and L21 (M18)	5313533

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## Technical data overview

Scanning range (typical/maximum)	0 m ... 25 m / 0 m ... 35 m
Light sender/type of light	LED/visible red light
Construction size	80.6 mm x 24.6 mm x 54 mm
Enclosure rating	IP 67
Ambient operating temperature from ... to	-40 °C ... +60 °C
Type	Type 2 (EN 61496) <sup>1)</sup>
Performance level	PL c (EN ISO 13849) <sup>1)</sup>

<sup>1)</sup> Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

## Product description

The L27 single-beam photoelectric safety switch is comprised of a sender and a receiver. The function of the L27 can be checked with the aid of the test input on the sender.

When connected to a suitable evaluation unit, such as Flexi Classic and DeviceNet Safety products, the L27 can achieve per-

formance levels up to PL c in accordance with EN ISO 13849-1.

Color LEDs provide current information about operational status.

The variety of device scanning ranges, suitability for outdoor applications, and the use of deflector mirrors enable more complex protection tasks.

## In-system added value

Combined with SICK safe control solutions

Combination with	Type of output	Number of sensors	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic main unit	PNP semiconductor, short-circuit protected, cross-circuit monitored	4	✓	✓	✓	0-2
Flexi Classic extension unit		4	✓	✓	✓	0-2
UE4470	Source output (PNP)	4	✓	✓	✓	P-17
UE4457	Bipolar type	4	✓	✓	✓	P-32

→ For more combinations, see annex

## Applications

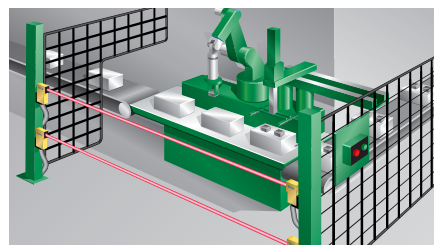
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Processing machines
- Machining centers
- Palletizer systems

- High-bay warehouses
- Transfer lines



Protection of a pallet loading station



Access protection in a machining center



- Compatible with safety controllers such as Flexi Classic and DeviceNet Safety products
- Integrated heating
- High scanning range
- Plastic housing, ABS
- Compact design
- Red light



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## Ordering information

- Scanning range: 25 m
- Connection type: Plug M12 x 4

Type of output	Front screen heating	System part	Type	Part no.
-	-	Sender	L27S-3D2430	2043906
PNP, Q and $\bar{Q}$	-	Receiver	L27E-3P2430	2043904
-	✓	Sender	L27S-3D2450	2043877
PNP, Q and $\bar{Q}$	✓	Receiver	L27E-3P2450	2043876

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Scanning range (typical/maximum)	0 m ... 25 m / 0 m ... 35 m	
Number of beams	1	
Light spot diameter (distance)	200 mm / 10 m	
Aperture angle/receiving angle	According to type 4 (IEC 61496-2)	
Light sender/type of light	LED/visible red light	-
Wave length	660 nm	-
Average service life (T <sub>A</sub> )	100.000 h (+25 °C)	-
Protection class	II	
Enclosure rating	IP 67	
Safety related parameters		
Type	Type 2 (EN 61496) <sup>1)</sup>	
Safety integrity level	SIL1 (IEC 61508), SILCL1 (IEC 62061) <sup>1)</sup>	
Category	Category 2 (EN ISO 13849) <sup>1)</sup>	
Test rate (external test)	100/s (EN ISO 13849) <sup>2)</sup>	
Maximum demand rate	60/min (EN ISO 13849) <sup>3)</sup>	
Performance level	PL c (EN ISO 13849) <sup>1)</sup>	
PFHd (mean probability of a dangerous failure per hour)	1.0 x 10 <sup>-6</sup> (EN ISO 13849) <sup>1)</sup>	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Design	Rectangular	
Dimensions (W x H x D)	80.6 mm x 24.6 mm x 54 mm	
Housing material	ABS	
Ambient operating temperature from ... to	-40 °C ... +60 °C	
Storage temperature from ... to	-40 °C ... +75 °C	
Weight	100 g	

<sup>1)</sup> Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

<sup>2)</sup> The test rate shall not be exceeded

<sup>3)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

## Electrical data

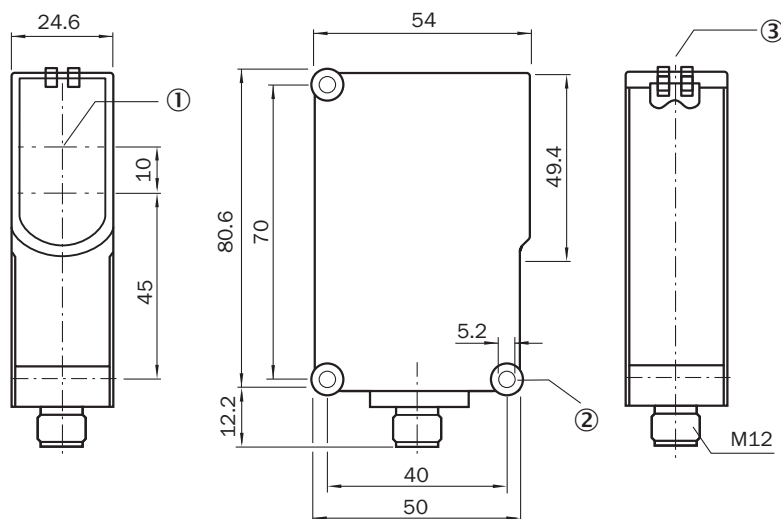
System part	Sender	Receiver
Connection type	Plug M12 x 4	
Supply voltage $V_s$	24 V DC (16.8 V DC ... 28.8 V DC) <sup>1)</sup>	
Maximum power consumption	35 mA	25 mA
Test input voltage	$V_s$ (sender on) 0 V DC (sender off)	-
Test duration	2.6 ms <sup>2)</sup>	-
Switching outputs	-	PNP, Q and $\bar{Q}$ <sup>3)</sup>
Maximum response time	-	540 $\mu$ s
Maximum switching sequence	-	1000 Hz
Maximum switching current	-	100 mA
Diagnostic display	LED	

<sup>1)</sup> Reverse polarity protected

<sup>2)</sup> Signal propagation time for resistive load, for test signal application (sender) and output signal reaction (receiver)

<sup>3)</sup> Short-circuit protected, interference suppression

## Dimensional drawings



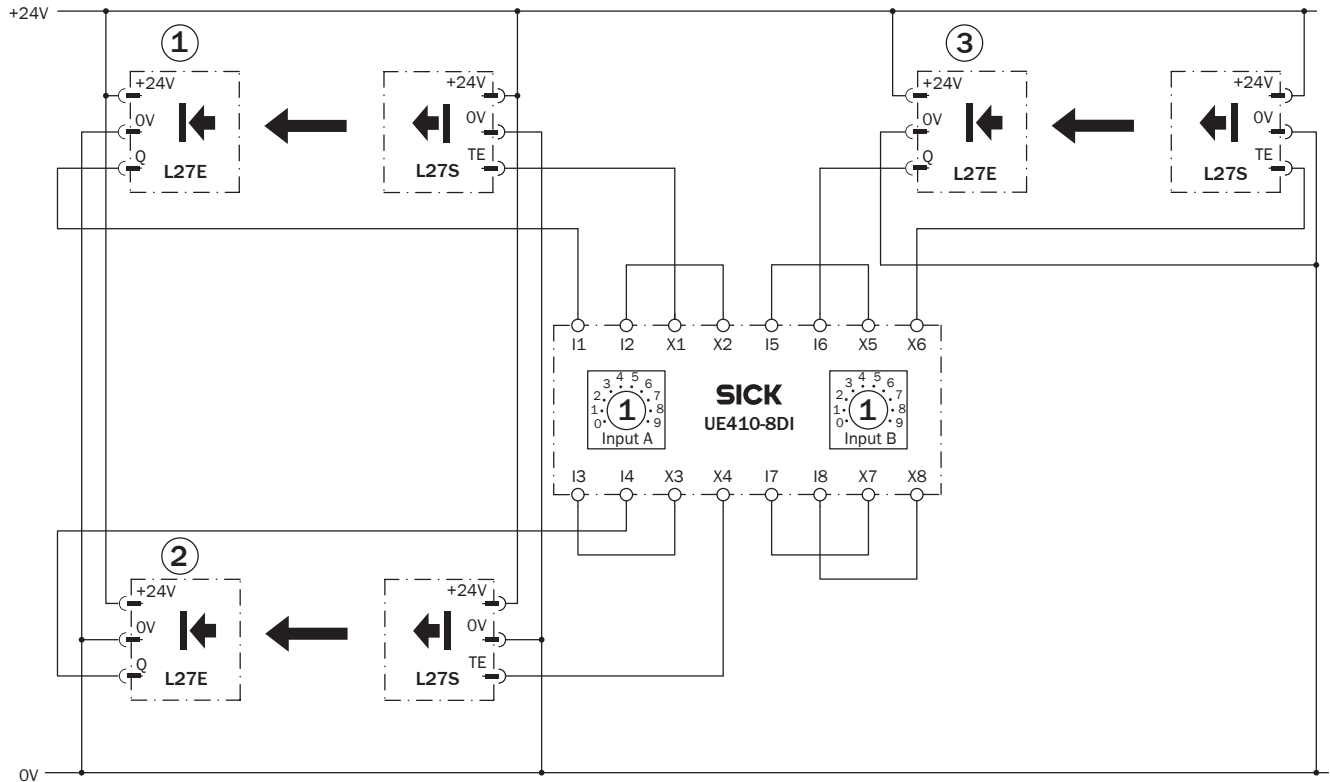
Dimensions in mm

H

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### 3 x L27 with a Flexi Classic UE410-8DI input expansion unit



4103L27\_/R01

#### Task

Integration of three L2000 (L27) family single-beam photoelectric safety switches in a UE410-8DI input expansion unit.

#### Function

The sensors switch when the light beam is clear. When sensor 1 and sensor 2 switch, the input condition for input A is met. When sensor 3 has switched, the input condition for input B is met. If a light beam is interrupted, the related input condition (input A or input B) shuts down the UE410-8DI.

#### Possible faults

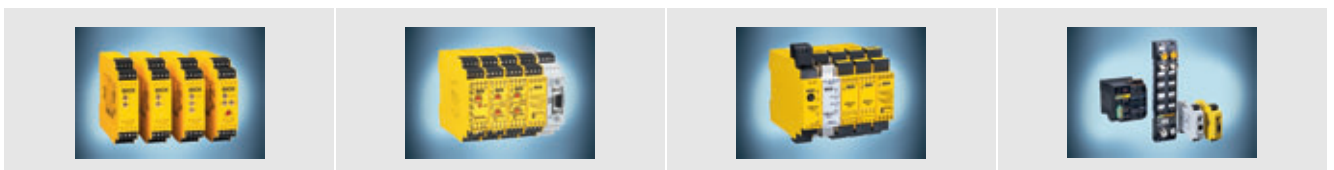
A UE410-8DI has two test pulse generators. This means that short-circuits between odd (X1) and evenly (X2) numbered outputs will be detected. Short-circuits between two odd (i.e., X1 and X3) or two evenly (i.e., X2 and X4) numbered outputs will not be detected. In this case, short-circuits between X1 and X4 and X1 and X6 are detected, but short-circuits between X4 and X6 are not detected.

#### Comments

Take note of the operating instructions for the integrated devices.

The safety-related parameters (safety integrity level and response time) are dependent on the types used.


## sens:Control – safe control solutions






Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories




### Mounting systems

Figure	Property	Description	Type	Part no.
	Mounting bracket	For L27	BEF-WN-W27	2009122
	Spring fastening	For PSK1	BEF-4AAAAHST3	2012473
	Fixing bracket	For PSK1	BEF-4GHAAHAL1	2009292

### Connectors

Figure	Connection type	Designation	Direction of cable outlet	Cable length	Cable material	Type	Part no.	
	M12 x 4	Female connector	Straight	-	-	DOS-1204-G	6007302	
			Angled	-	-	DOS-1204-W	6007303	
			Straight	2 m	PVC	DOL-1204-G02M	6009382	
				5 m	PVC	DOL-1204-G05M	6009866	
					PUR halogen free	DOL-1204-G05MC	6025901	
			Angled	10 m	PVC	DOL-1204-G10M	6010543	
				2 m	PVC	DOL-1204-W02M	6009383	
					5 m	PVC	DOL-1204-W05M	6009867
						PUR halogen free	DOL-1204-W05MC	6025904
					10 m	PVC	DOL-1204-W10M	6010541

### Deflector mirrors <sup>1)</sup>

Figure	Mirror surface	Deflection angle	Description	Type	Part no.
	75 mm x 80 mm	-	Including mounting adapter (two-piece swivel mount)	PNS75-008	1026647
	96 mm x 124 mm	-	-	PSK1	1005229
	80 mm x 97 mm	90°	For 90° deflection, incl. mounting set; not suitable for column mounting	PSK45	5306053

<sup>1)</sup> Reduction of the scanning range



- Compatible with safety controllers such as Flexi Classic and DeviceNet Safety products
- Compact design
- Red light
- Plastic housing, ABS



## Technical data overview

Scanning range (typical/maximum)	0 m ... 12 m / 0 m ... 18 m
Light sender/type of light	LED/visible red light
Construction size	75.5 mm x 17.6 mm x 33.5 mm
Enclosure rating	IP 67
Ambient operating temperature from ... to	-40 °C ... +60 °C
Type	Type 2 (EN 61496) <sup>1)</sup>
Performance level	PL c (EN ISO 13849) <sup>1)</sup>

<sup>1)</sup> Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

## Product description

The L28 single-beam photoelectric safety switch comprises a sender and a receiver. The function of the L28 can be checked with the aid of the test input on the sender. When connected to a suitable evaluation unit, such as Flexi Classic and DeviceNet Safety products, the L28 can achieve performance levels up to PL c in accordance with EN ISO 13849-1.

Color LEDs provide current information about operational status. The variety of device scanning ranges, suitability for outdoor applications, and the use of deflector mirrors enable more complex protection tasks.

## In-system added value

Combined with SICK safe control solutions

Combination with	Type of output	Number of sensors	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic main unit	PNP semiconductor, short-circuit protected, cross-circuit monitored	4	✓	✓	✓	0-2
Flexi Classic extension unit		4	✓	✓	✓	0-2
UE4470	Source output (PNP)	4	✓	✓	✓	P-17
UE4457	Bipolar type	4	✓	✓	✓	P-32

→ For more combinations, see annex

## Applications

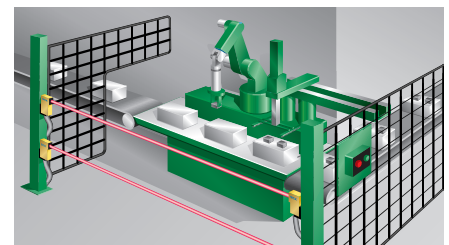
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Processing machines
- Machining centers
- Palletizer systems
- High-bay warehouses
- Transfer lines

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Protection of a pallet loading station



Access protection in a machining center

## Ordering information

- Scanning range: 12 m
- Connection type: Plug M12 x 4

Type of output	System part	Type	Part no.
-	Sender	L28S-3D2431	2044515
PNP, Q and $\bar{Q}$	Receiver	L28E-3P2431	2044516

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General data

System part	Sender	Receiver
Scanning range (typical/maximum)	0 m ... 12 m / 0 m ... 18 m	
Number of beams	1	
Light spot diameter (distance)	300 mm / 10 m	
Aperture angle/receiving angle	According to type 4 (IEC 61496-2)	
Light sender/type of light	LED/visible red light	-
Wave length	660 nm	-
Average service life (T <sub>A</sub> )	100.000 h (+25 °C)	-
Protection class	II	
Enclosure rating	IP 67	
Safety related parameters	Type 2 (EN 61496) <sup>1)</sup> Safety integrity level SIL1 (IEC 61508), SILCL1 (IEC 62061) <sup>1)</sup> Category 2 (EN ISO 13849) <sup>1)</sup> Test rate (external test) 100/s (EN ISO 13849) <sup>2)</sup> Maximum demand rate 60/min (EN ISO 13849) <sup>3)</sup> Performance level PL c (EN ISO 13849) <sup>1)</sup> PFHd (mean probability of a dangerous failure per hour) 1.0 x 10 <sup>-6</sup> (EN ISO 13849) <sup>1)</sup> T <sub>M</sub> (Mission Time) 20 years (EN ISO 13849)	
Design	Rectangular	
Dimensions (W x H x D)	75.5 mm x 17.6 mm x 33.5 mm	
Housing material	ABS	
Ambient operating temperature from ... to	-40 °C ... +60 °C	
Storage temperature from ... to	-40 °C ... +75 °C	
Weight	40 g	

<sup>1)</sup> Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

<sup>2)</sup> The test rate shall not be exceeded

<sup>3)</sup> Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

Electrical data

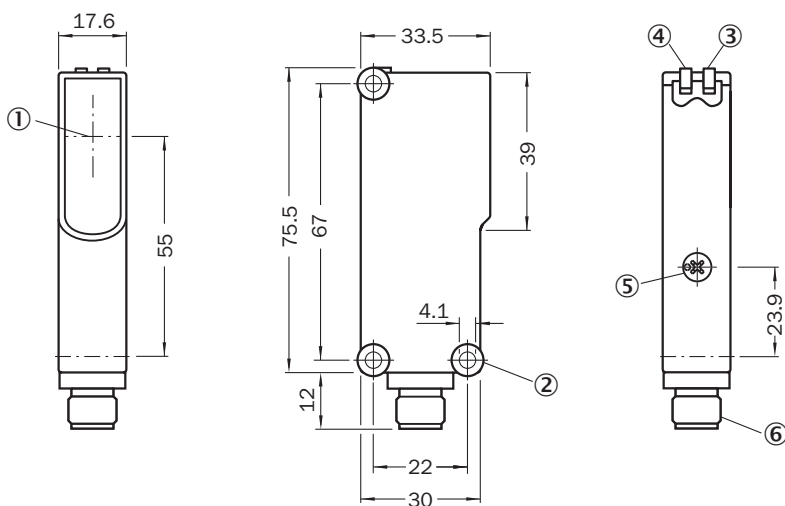
System part	Sender	Receiver
Connection type	Plug M12 x 4	
Supply voltage $V_s$	24 V DC (16.8 V DC ... 28.8 V DC) <sup>1)</sup>	
Maximum power consumption	35 mA	25 mA
Test input voltage	$V_s$ (sender on) 0 V DC (sender off)	-
Test duration	2 ms <sup>2)</sup>	-
Switching outputs	-	PNP, Q and $\bar{Q}$ <sup>3)</sup>
Maximum response time	-	500 $\mu$ s
Maximum switching sequence	-	1000 Hz
Maximum switching current	-	100 mA
Diagnostic display	LED	

<sup>1)</sup> Reverse polarity protected

<sup>2)</sup> Signal propagation time for resistive load, for test signal application (sender) and output signal reaction (receiver)

<sup>3)</sup> Short-circuit protected, interference suppression

Dimensional drawings



Dimensions in mm

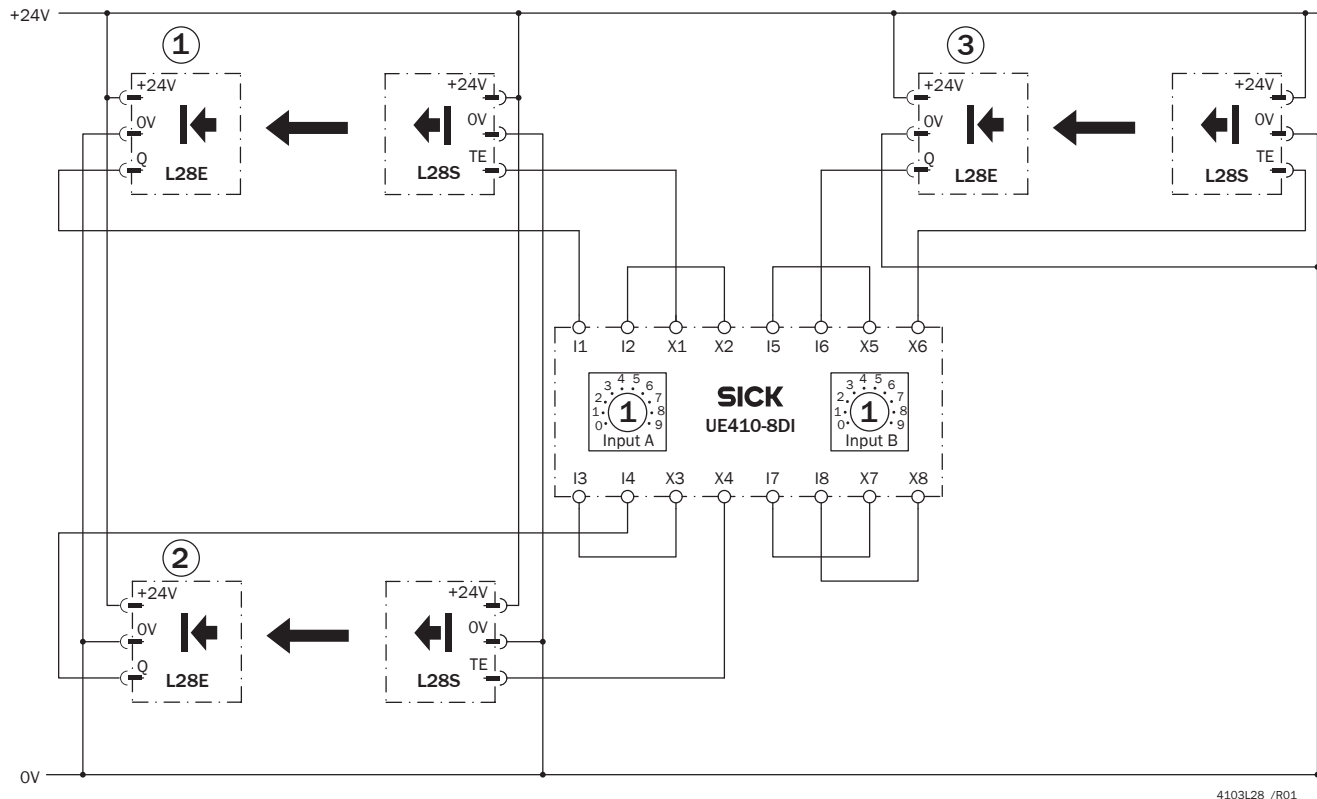
H



## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### 3 x L28 with a Flexi Classic UE410-8DI input expansion unit



#### Task

Integration of three L2000 (L28) family single-beam photoelectric safety switches in a UE410-8DI input expansion unit.

#### Function

The sensors switch when the light beam is clear. When sensor 1 and sensor 2 switch, the input condition for input A is met. If sensor 3 has switched, the input condition for input B is met. If a light beam is interrupted, the related input condition (input A or input B) shuts down the UE410-8DI.

#### Possible faults

A UE410-8DI has two test pulse generators. This means that short-circuits between odd (X1) and evenly (X2) numbered outputs will be detected. Short-circuits between two odd (i.e., X1 and X3) or two evenly (i.e., X2 and X4) numbered outputs will not be detected. In this case, short-circuits between X1 and X4 and X1 and X6 are detected, but short-circuits between X4 and X6 are not detected.

#### Comments

Take note of the operating instructions for the integrated devices.

The safety-related parameters (safety integrity level and response time) are dependent on the types used.

## sens:Control – safe control solutions






Optimal integration of all safety components leads to a complete solution with sens:Control – safe control solutions: Safety relays (from page N-0), safety controllers (from page O-0) and network solutions (from page P-0).

## Accessories

### Mounting systems



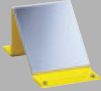
Property	Description	Type	Part no.
Mounting bracket	For L28	BEF-WN-W18	2009317
Spring fastening	For PSK1	BEF-4AAAAHST3	2012473
Fixing bracket	For PSK1	BEF-4GHAAHAL1	2009292

### Connectors

Figure	Connection type	Designation	Direction of cable outlet	Cable length	Cable material	Type	Part no.		
	M12 x 4	Female connector	Straight	-	-	DOS-1204-G	6007302		
			Angled	-	-	DOS-1204-W	6007303		
			Straight	2 m	PVC	DOL-1204-G02M	6009382		
						5 m	PVC	DOL-1204-G05M	6009866
							PUR halogen free	DOL-1204-G05MC	6025901
						10 m	PVC	DOL-1204-G10M	6010543
			Angled	2 m	PVC	DOL-1204-W02M	6009383		
						5 m	PVC	DOL-1204-W05M	6009867
							PUR halogen free	DOL-1204-W05MC	6025904
						10 m	PVC	DOL-1204-W10M	6010541

H

Deflector mirrors <sup>1)</sup>

Figure	Mirror surface	Deflection angle	Description	Type	Part no.
	75 mm x 80 mm	–	Including mounting adapter (two-piece swivel mount)	PNS75-008	1026647
	96 mm x 124 mm	–	–	PSK1	1005229
	80 mm x 97 mm	90°	For 90° deflection, incl. mounting set; not suitable for column mounting	PSK45	5306053

<sup>1)</sup> Reduction of the scanning range

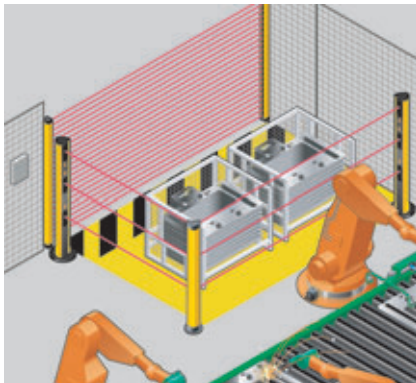
# Mirror columns and device columns

## Applications

Mirror and device columns are used where there are problems mounting opto-electronic protective devices. On machining centers or material gates, the opto-electronic protective devices must be positioned in an open room.

Typical applications are:

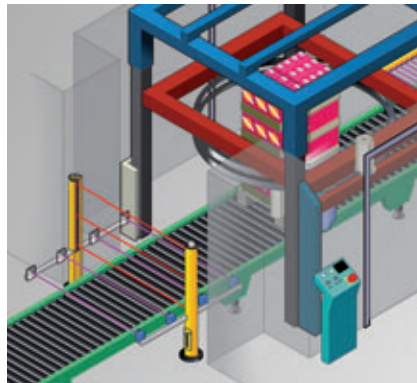
- Palletizer/depalletizer
- Storage and conveyor
- Packaging industry
- Automotive industry
- Machine tool industry
- Handling machines
- Entry/Exit systems
- Robot stations
- Muting stations



### Mirror columns

When combined with multiple light beam safety devices or safety light curtains, mirror columns offer important advantages:

- Since there are only two active sides, the cabling effort is considerably reduced.
- The unhindered access eases loading and makes it easy to change tools and programs.



### Device columns with external grooves

The robust device columns can be used universally:

- To position multiple light beam safety devices or safety light curtains in an open room
- The two external mounting grooves, in combination with the muting arms, brackets and protective plates, provide perfect conditions for the installation of muting stations.



### Device columns for outdoor use

They are used to mount multiple light beam safety devices in outdoor applications that reach temperatures as low as  $-15^{\circ}\text{C}$ .

Due to its heating feature, the front screen does not mist up and the multiple light beam safety device remains at operating temperature.

## Mounting and operation of muting stations made easy



Using mirror columns and device columns from SICK offers unbeatable advantages – from ordering to inventory.

### Small number of components

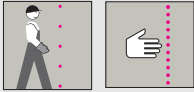
- Easy mounting
- Active/passive variants
- Pre-mounted kits for
  - crossed muting (2 sensors) and
  - parallel muting (4 sensors)

### Versatility

- High flexibility in x, y, z directions
- Optional muting sensor protection



Safety application	Mirror length (mm)	Mirror width (mm)	Column height (mm)	Maximum installation length (mm)	Distance of first beam from the floor (mm)	Suitable for			Product	Page
						Protective field height (mm)	Number of beams	Beam separation (mm)		
	900 ... 1800	125	1285 ... 2200	-	300/ 400	150 ... 1800	Any	Any	Mirror columns with protective field height mirror	I-2
	90	100	985 ... 1285	-	300/ 400	-	2/3/4	300 ... 600	Mirror columns with separate mirrors	I-5
	-	-	985 ... 2420	965 ... 2400	300/ 400	150 ... 1800	Any	Any	Device columns with external grooves	I-9
	-	-	1223	1203	300/ 400	-	2/3	400/500	Device columns for outdoor use	I-15



- Compact, durable design
- High availability
- Large mirror surface
- Easy mounting
- Universal application for:
  - Multiple light beam safety devices
  - Safety light curtains

## Technical data overview

Suitable for	M4000 M2000 C4000 C2000
Mirror length (depending on type)	900 mm ... 1800 mm
Protective field heights (depending on type)	150 mm ... 1800 mm
Column heights (depending on type)	1285 mm ... 2200 mm
Design	With protective field height mirror

## Product description

Mirror columns are used where protection on several sides is necessary or there are problems mounting opto-electronic protective devices.

On machining centers, the opto-electronic protective devices must be positioned in an open room. The combination of multiple light beam safety devices or safety light curtains with deflector mirrors provides the ideal solution. Since there are only two active sides, the cabling effort is considerably reduced.

The unhindered access for loading and easily changing tools and programs is a further advantage over mechanical fencing.

The use of mirror columns results in increased productivity.

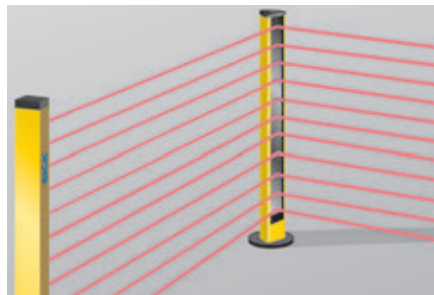
Appropriate accessories such as an adjusting plate and steel fixing bolts make it easier to quickly mount and align the mirror columns on the floor.

## Applications

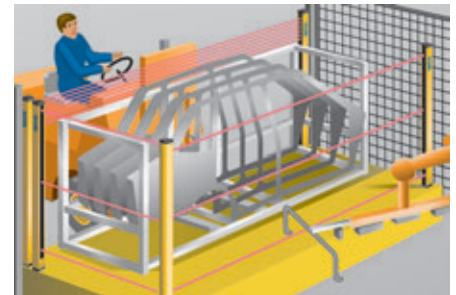
→ For more applications, please refer to the application finder at [www.mysick.com](http://www.mysick.com)

- Machine tool industry
- Robot stations

- Automotive industry
- Handling machines



Application with safety light curtain



Automotive industry: Hazardous point protection on an assembly line

Further information	Page
→ Dimensional drawings	I-4
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### Mirror columns<sup>1)</sup>



Description	Suitable for		Mirror length	Column height	Type	Part no.
	maximum protective field height <sup>2)</sup>	number of beams/ beam separation <sup>3)</sup>				
For C4000/C2000 and M4000/M2000	900 mm	Any	900 mm	1285 mm	PM3C13-00030000	1043453
	1350 mm		1350 mm	1720 mm	PM3C17-00030000	1043454
	1650 mm		1650 mm	2000 mm	PM3C19-00030000	1043455
	1800 mm		1800 mm	2200 mm	PM3C20-00030000	1043456

<sup>1)</sup> Scanning range reduction depending on type; see related device operating instructions (chapter "Scanning range, PNS125 list")

<sup>2)</sup> Safety light curtains

<sup>3)</sup> Multiple light beam safety devices; distance of the first beam from the floor is 300 mm or 400 mm (depending on standard height)

### Mounting systems

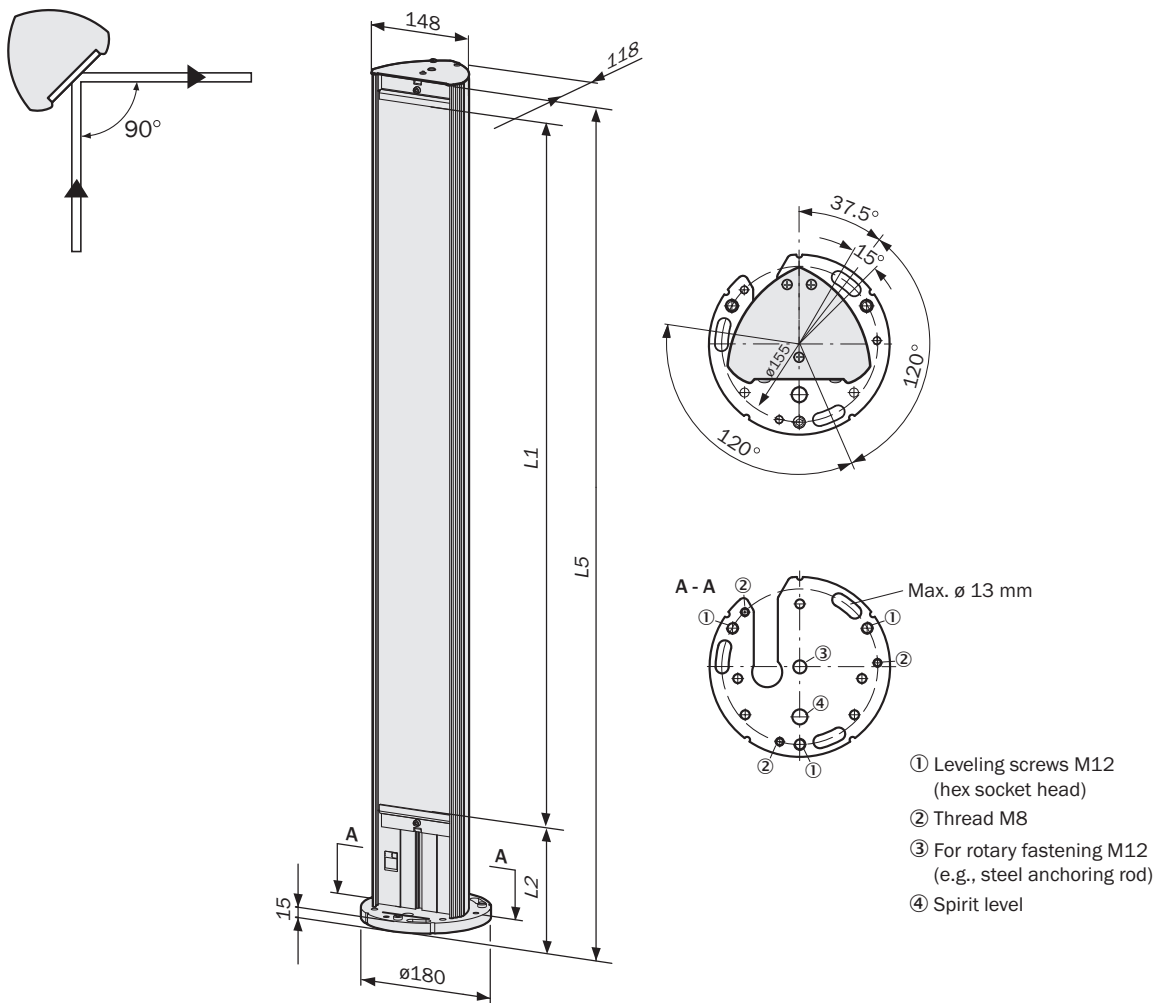
Figure	Description	Packing unit	Type	Part no.
	For floor mounting	1	Adjusting plate	4031053
			Steel fixing bolt	5308961

### Other

Figure	Description	Remark	Packing unit	Type	Part no.
	For back area monitoring	Including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Dimensional drawings

### Mirror columns

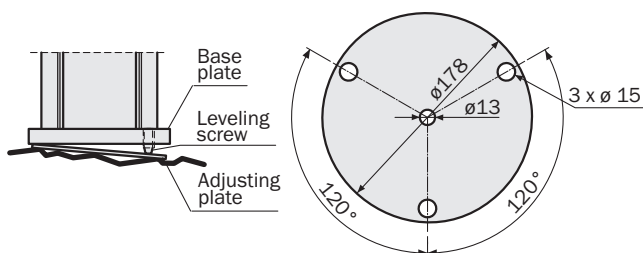


Mirror length S	L1	L2	L5	Part no.
900	1082	160	1281.5	1043453
1350	1532	145	1716.5	1043454
1650	1682	295	2016.5	1043455
1800	1832	345	2216.5	1043456

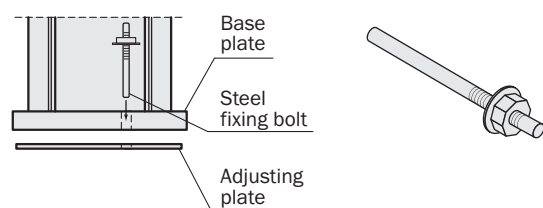
Dimensions in mm

### Mounting systems

#### Adjusting plate



#### Steel fixing bolt



Dimensions in mm



## Technical data overview

Suitable for	M4000 M2000
Number of beams (depending on type)	2, 3, 4
Column heights (depending on type)	985 mm ... 1285 mm
Design	With up to 4 separate adjustable mirrors

## Product description

Mirror columns are used where protection on several sides is necessary or there are problems mounting opto-electronic protective devices.

On machining centers, the opto-electronic protective devices must be positioned in an open room. The combination of multiple light beam safety devices with deflector mirrors is the ideal solution. Since there are only two active sides, the cabling effort is considerably reduced.

The adjustment of the deflector mirrors mounted in sturdy columns is very

straightforward. The unhindered access for loading and easily changing tools and programs is a further advantage over mechanical fencing.

The use of mirror columns results in increased productivity.

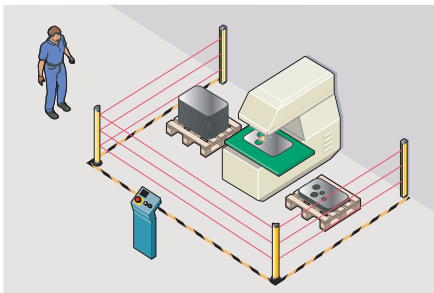
Appropriate accessories such as an adjusting plate and steel fixing bolts make it easier to quickly mount and align the mirror columns on the floor.

## Applications

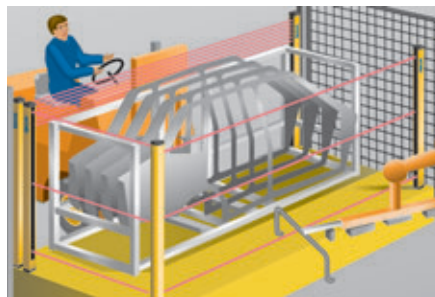
→ For more applications, please refer to the application finder at [www.mysick.com](http://www.mysick.com)

- Machine tool industry
- Robot stations

- Automotive industry
- Handling machines



Machine tool industry: Access protection with deflector mirror columns on a punching machine



Automotive industry: Hazardous point protection on an assembly line



Product may differ from illustration

- Compact, durable design
- High availability
- Large mirror surface
- Optimal adjustment
- Easy mounting
- Applicable for multiple light beam safety devices

Further information	Page
→ Ordering information	I-6
→ Dimensional drawings	I-7
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### Mirror columns for multiple light beam safety devices<sup>1)</sup>

Description	Suitable for	Number of beams	Beam separation (mm)	Type	Part no.
Horizontal deflection	M40#-0250##### M20S-02#50##### M20E-02#50#####	2	500	PM3S96-00240020	1040619
	M40#-03400##### M40#-03401##### M20#-03#40#1##	3	400	PM3S11-00330030	1040625
	M40#-0430##### M20#-04#30#####	4	300	PM3S13-00430040	1040626
	M40#-0260#####	2	600	PM3S96-00230060	1040620
	M40#-0345#####	3	450	PM3S13-00330050	1040624
Vertical deflection	M40Z-0250##### M20Z-02#####	2	500	PM2Z96-30240020	1027265



<sup>1)</sup> Warning: reduction of the scanning range!

The scanning range is reduced per mirror deflection (n) in accordance with the following formula:


$$\text{Scanning range (with mirror deflection)} = \text{scanning range (of the light beam safety device without mirror deflection)} \times \sqrt{0.8^n}$$

Example: M2000 with a scanning range of 25 m is deflected three times. The scanning range is now  $25 \text{ m} \times \sqrt{0.8^3} = 17.8 \text{ m}$

## Mounting systems

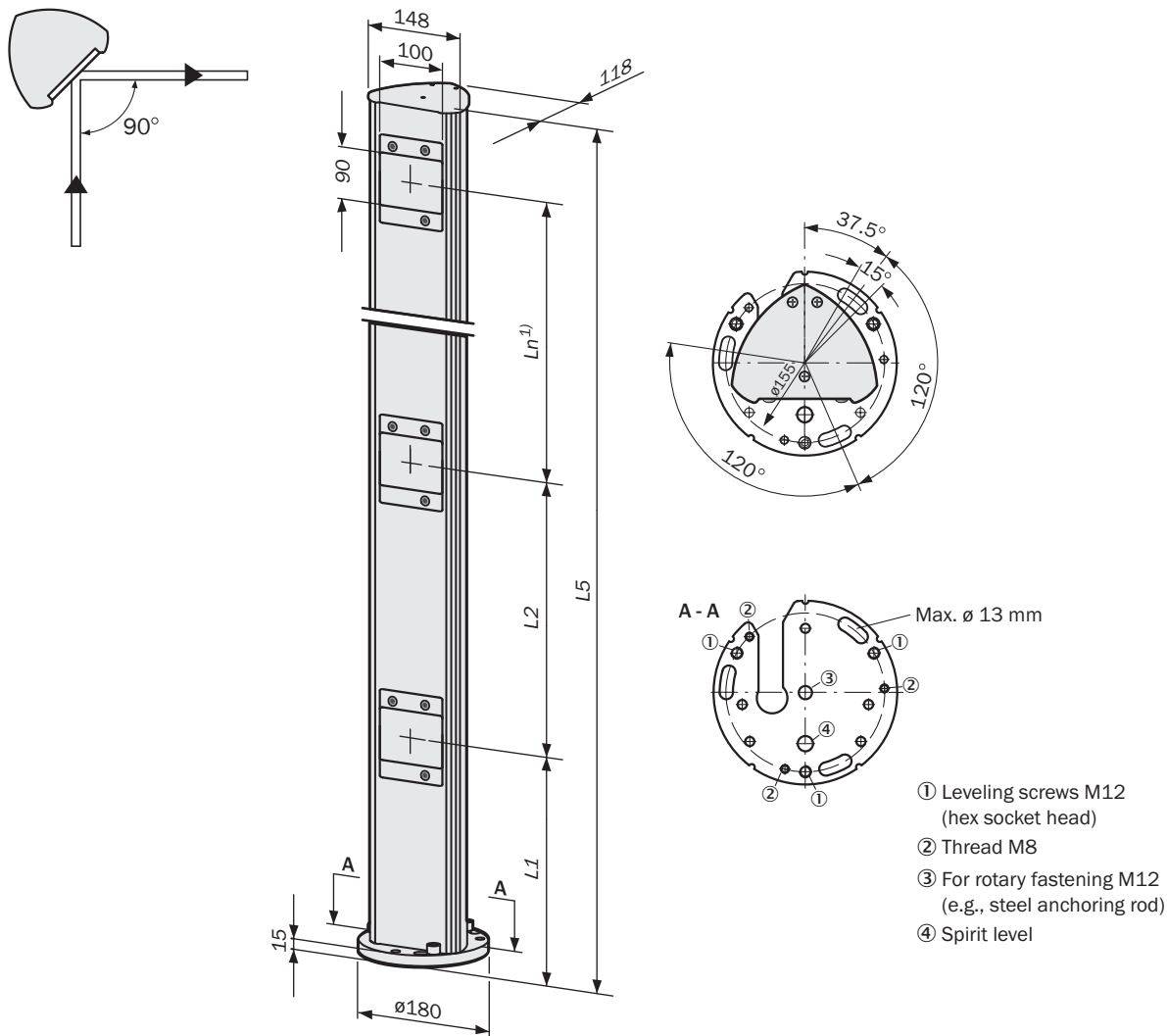
Figure	Description	Packing unit	Type	Part no.
	For floor mounting	1	Adjusting plate	4031053
			Steel fixing bolt	5308961

## Other

Figure	Description	Remark	Packing unit	Type	Part no.
	For back area monitoring	Including spacer bolt	1	Mirror kit for back area monitoring	2034938

## Dimensional drawings

### Mirror columns with horizontal deflection for multiple light beam safety devices

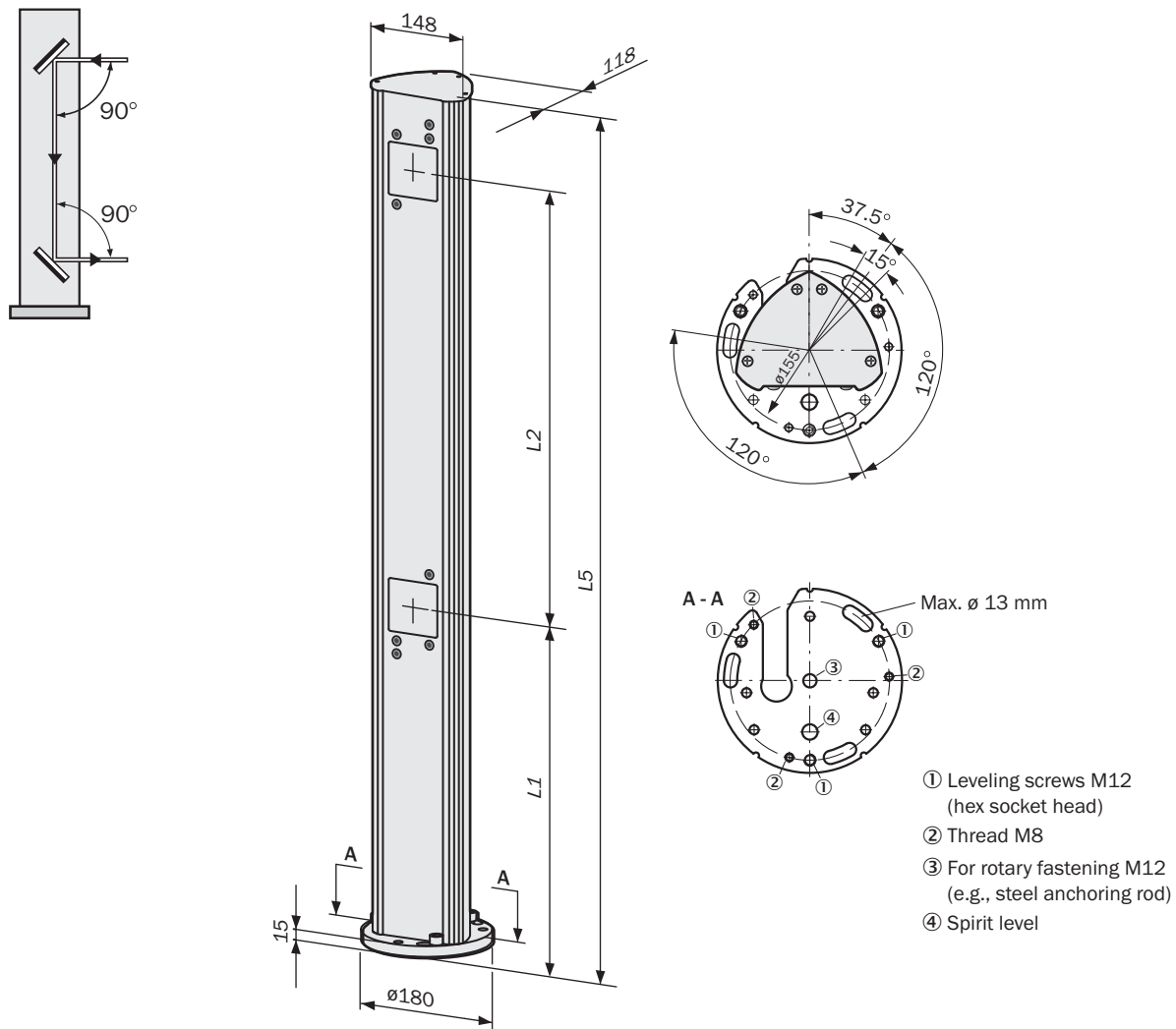


<sup>1)</sup> L<sub>n</sub> in the illustration corresponds to the values L<sub>3</sub> and L<sub>4</sub> in the table depending on the mirror column

Number of beams	L1	L2	L3	L4	L5	Part no.
2	400	500	—	—	985	1040619
3	300	400	400	—	1185	1040625
4	300	300	300	300	1285	1040626
2	300	600	—	—	985	1040620
3	300	450	450	—	1285	1040624

Dimensions in mm

Mirror column with vertical deflection for multiple light beam safety devices



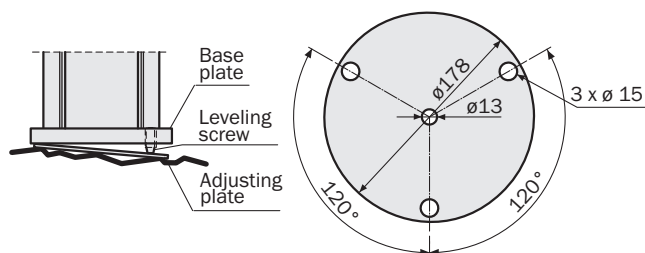
- ① Leveling screws M12 (hex socket head)
- ② Thread M8
- ③ For rotary fastening M12 (e.g., steel anchoring rod)
- ④ Spirit level

Number of beams	L1	L2	L5	Part no.
2	400	500	985	1027265

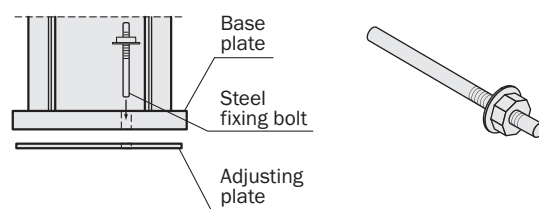
Dimensions in mm

Mounting systems

Adjusting plate



Steel fixing bolt



Dimensions in mm

## Technical data overview

Suitable for	M4000 M2000 C4000 C2000
Number of beams (depending on type)	2, 3, 4
Protective field heights (depending on type)	150 mm ... 1800 mm
Column heights (depending on type)	985 mm ... 2420 mm
Design	With 2 external mounting grooves

## Product description

Device columns are used where there are problems mounting opto-electronic protective devices.

On machining centers or material gates, the opto-electronic protective devices must be positioned in an open room. An Entry/Exit system is often used at the gates for automatic material transport. The device columns with the two external mounting grooves, in combination with the muting

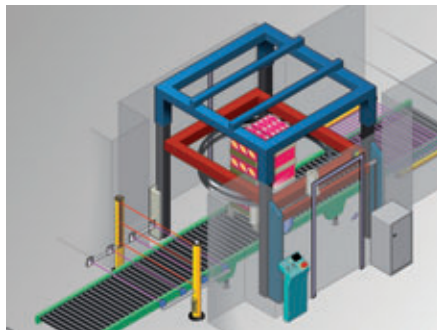
arms, brackets and protective plates, ensure straightforward, flexible attachment of the muting sensors. Pre-assembled kits significantly reduce the number of items that need to be ordered and the on-site assembly time.

Appropriate accessories such as an adjusting plate and steel fixing bolts make it easier to quickly mount and align the device columns on the floor.

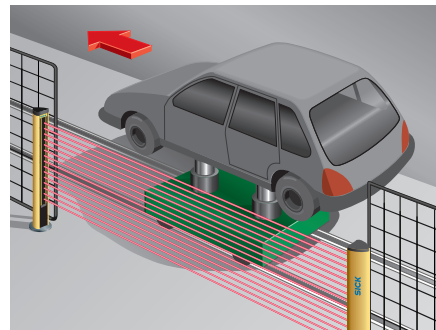
## Applications

→ For more applications, please refer to the application finder at [www.sick.com](http://www.sick.com)

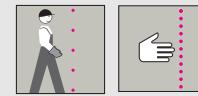
- Palletizer/depalletizer
- Storage and conveyor
- Packaging industry
- Stone production
- Automotive industry
- Robot stations



Packaging industry: Muting application on a pallet stretch wrapper



Automotive industry: Hazardous point protection on an assembly line



- Extreme stability
- 2 external mounting grooves
- Easy adjustment and mounting
- Device protection
- High availability
- Universal application for:
  - Multiple light beam safety devices
  - Safety light curtains

Further information	Page
→ Ordering information	I-10
→ Dimensional drawings	I-12
→ Systematic safety	A-0
→ Services	B-0




## Ordering information

### Device columns

Suitable for	Number of beams	Height of 1st beam from the floor <sup>1)</sup> (mm)	Protective field height (mm)	Max. installation length (mm)	Column height (mm)	Type	Part no.
M4000/M2000, C4000/C2000	2	400	150 ... 600	965	985	PU3H96-00000000	2045490
	3	300	150 ... 900	1165	1185	PU3H11-00000000	2045641
	4	300	150 ... 1050	1265	1285	PU3H13-00000000	2045642
	-	-	150 ... 1350	1720	1740	PU3H17-00000000	2045643
	-	-	150 ... 1650	2020	2040	PU3H21-00000000	2045644
	-	-	150 ... 1800	2250	2270	PU3H22-00000000	2045645
	-	-	150 ... 1800	2400	2420	PU3H24-00000000	2045646







<sup>1)</sup> Standard height

### Mounting systems

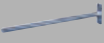


Figure	Designation	Suitable for	Packing unit	Type	Part no.
	Omega bracket	M4000	2	BEF-2SMGEAAL2	2045736
		C2000/C4000/M2000 in large housing		BEF-2SMMEAAL2	2045883
		C2000/C4000 in small housing		BEF-2SMKEAAL2	2045884
	Adjusting plate	For floor mounting	1	Adjusting plate	4031053
	Steel fixing bolt			Steel fixing bolt	5308961

### Muting mechanical accessories



#### Partially-assembled/pre-assembled muting arm kits for device column mounting, including mounting systems

Figure	Designation	Description	Part no.
	Round steel arm 400 mm, including 1 x universal bracket	For PU3H column profile and M4000 device profile	2045506
	Round steel arm 400 mm, including 2 x universal brackets		2045507
	Round steel arm 400 mm, including 1 x universal bracket with P250 fitted reflector		2045513
	Round steel arm 400 mm, including 2 x universal brackets with P250 fitted reflector		2045512
	Round steel arm 400 mm, including 1 x universal bracket with WL280P132 fitted sensor, 2 m cable with M12 plug		2045729
	Round steel arm 400 mm, including 2 x universal brackets with WL280P132 fitted sensor, 2 m cable with M12 plug		2045730

**Muting mechanical components for device column mounting, including mounting systems**



Figure	Designation	Description	Part no.
	Round steel arm 400 mm, for mounting of universal brackets	For PU3H column profile and M4000 device profile	2045879
	Universal bracket for mounting sensors/reflectors	For round steel arm 400 mm	2044953
	Muting sensor protection, right side, for round steel arm		2045737
	Muting sensor protection, left side, for round steel arm		2045738

**M4000 muting arm kits**

Figure	Designation	Description	Suitable for	Part no.
	Muting arm kit M4000, 2 crossed-muting sensors	Crossed muting (2 sensors), muting sensor brackets for mounting on M4000 housing profile or device columns with external assembling grooves	Muting with two crossed-muting sensors for M4000 Advanced A/P and PU3Hxx device columns	2046171
	Muting arm kit M4000, 4 parallel-muting sensors	Parallel muting (4 sensors), muting sensor brackets for mounting on M4000 housing profile or device columns with external assembling grooves	Muting with four parallel-muting sensors for M4000 Advanced A/P and PU3Hxx device columns	2046170

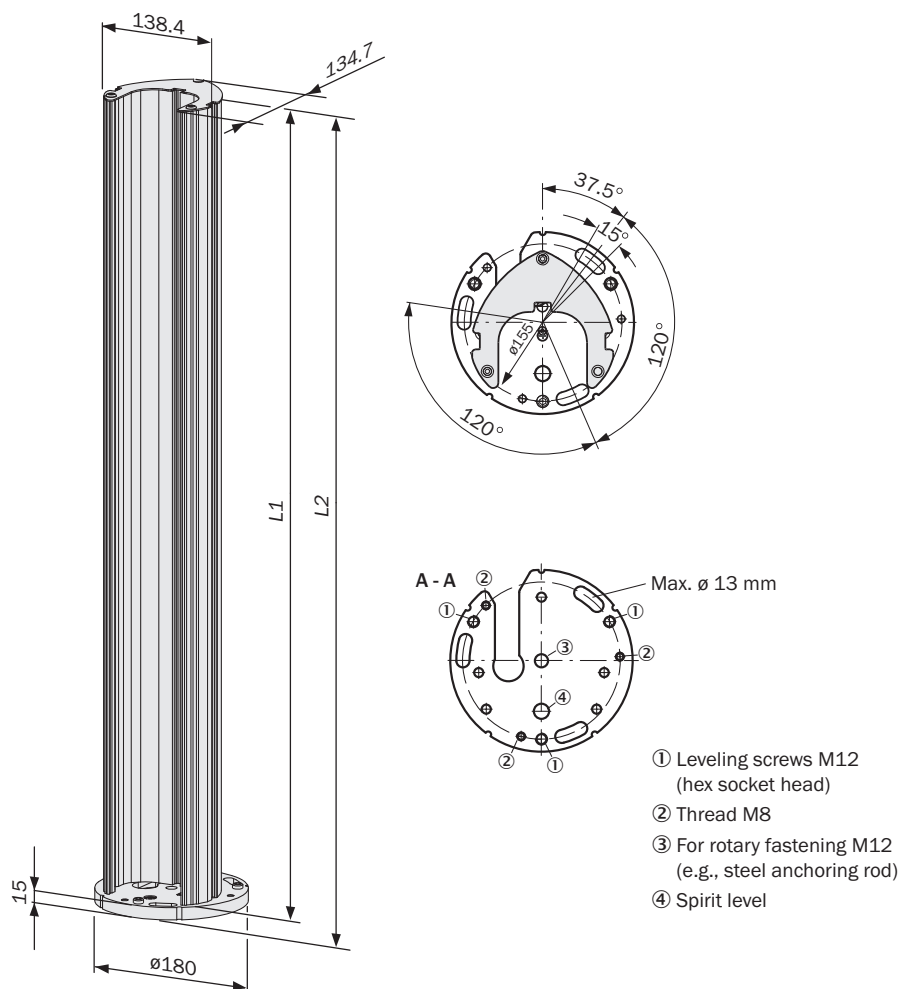
**Additional muting accessories**

**Muting indicator lamps**

Figure	Type of muting indicator	Connection type	Cable length	Remark	Part no.
	LED	Plug connection	2 m	Including mounting bracket and mounting kit	2033118
			10 m	Including mounting bracket	2033119
	Lamp	Plug connection	2 m	Including mounting bracket and mounting kit	2033116
			10 m	Including mounting bracket	2033117

## Dimensional drawings

### Device columns



Number of beams	Protective field height	L1	L2	Part no.
2	300 ... 600	965	985	2045490
3	300 ... 900	1165	1185	2045641
4	300 ... 1050	1265	1285	2045642
-	300 ... 1350	1720	1740	2045643
-	300 ... 1650	2020	2040	2045644
-	300 ... 1800	2250	2270	2045645
-	300 ... 1800	2400	2420	2045646

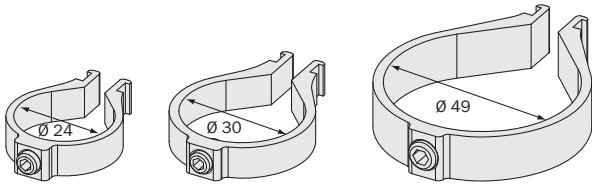
Dimensions in mm



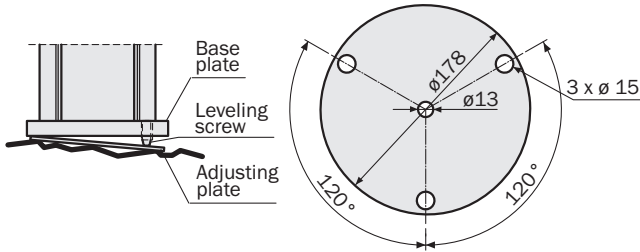
Mounting systems

Omega brackets

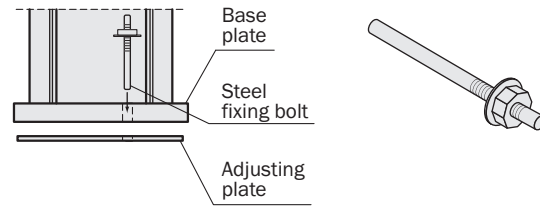
BEF-2SMKEAAL2, BEF-2SMMEAAL2, BEF-2SMGEAAL2



Adjusting plate

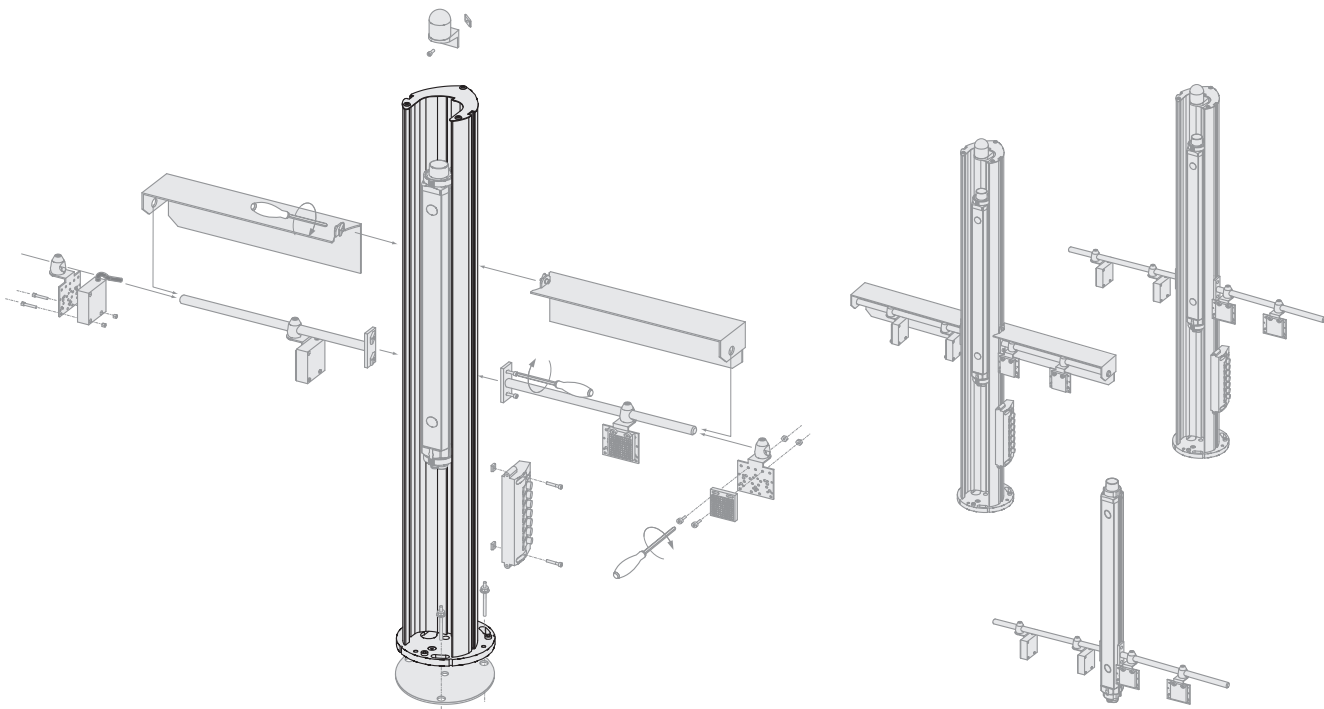


Steel fixing bolt



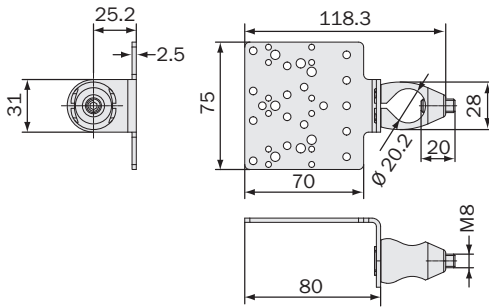
Dimensions in mm

Overall layout of the device columns with muting mechanical accessories

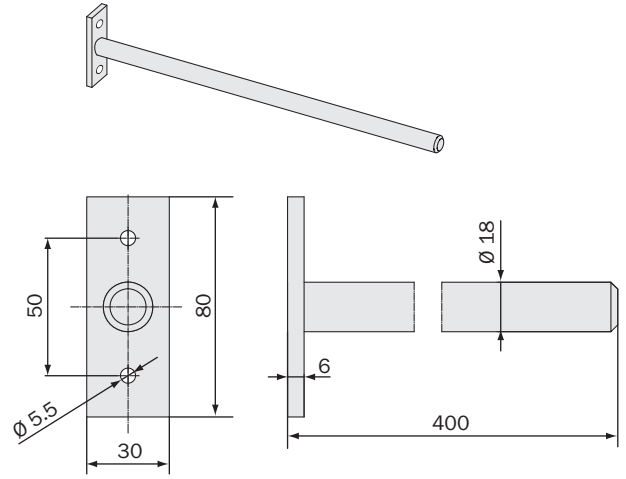


Muting mechanical accessories

Universal bracket

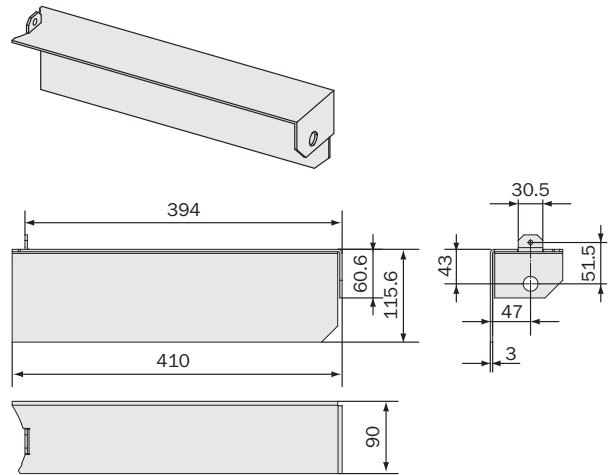
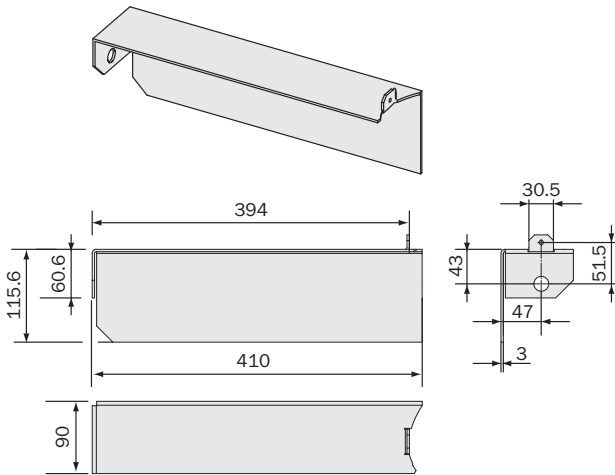


Round steel arm



Dimensions in mm

Muting sensor protection, left/right



Dimensions in mm

## Technical data overview

Suitable for	M4000 M2000
Number of beams (depending on type)	2, 3
Column height	1223 mm
Design	With front screen heating for outdoor use (down to -15 °C)

## Product description

The heatable device columns are used to mount the M4000 and M2000 multiple light beam safety devices in outdoor applications that reach temperatures down to -15 °C.

Sender and receiver are mounted in the columns. Due to its heating feature, the front screen does not mist up and the mul-

multiple light beam safety device remains at operating temperature. The components are conditionally corrosion-resistant to ambient effects such as saltwater.

Appropriate accessories such as an adjusting plate and steel fixing bolts make it easier to quickly mount and align the device columns on the floor.

## Applications

→ For more applications, please refer to the application finder at [www.sick.com](http://www.sick.com)

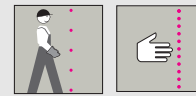
- Outdoor application
- Stone production
- Automotive industry
- Wood industry



Wood industry: Access protection on a sawmill



Port: Access protection on a container bridge



Product may differ from illustration

- Outdoor applications down to -15 °C
- Easy mounting
- Device protection
- Applicable for multiple light beam safety devices

Further information	Page
→ Ordering information	I-16
→ Dimensional drawings	I-17
→ Systematic safety	A-0
→ Services	B-0

## Ordering information


### Device columns<sup>1)</sup>

Description	Suitable for	Number of beams	Beam separation (mm)	Type	Part no.
With front screen heating, 220 V, including brackets and cable socket (without multiple light beam safety device)	M40#-0250#0##0 M40#-0250#3##0	2	500	PUM12-S02	2019654
	M40#-0340#0##0 M40#-0340#3##0	3	400	PUM12-S01	2020800
	M20#-02#50A###	2	500	PUG12-S02	2023707
	M20#-03#40A###	3	400	PUG12-S01	2025441

<sup>1)</sup> Warning: reduction of the scanning range! Each front screen reduces the scanning range by 7.5 %.

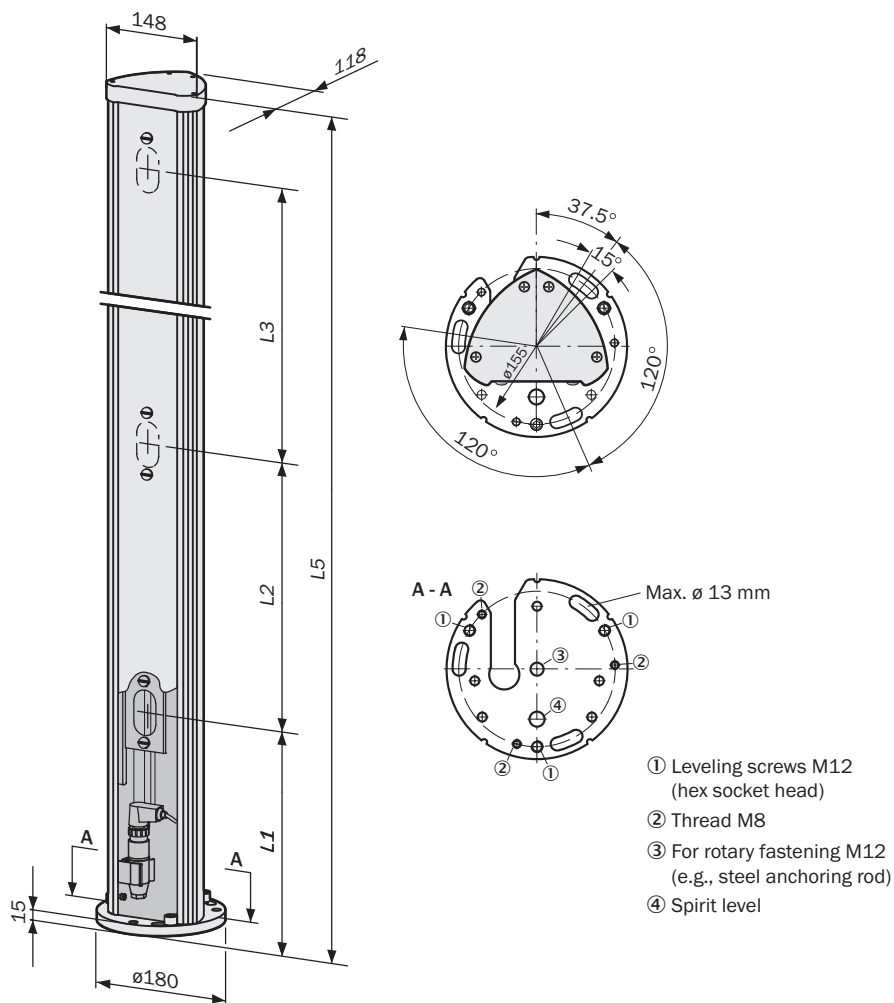
Example: M2000 sender and receiver mounted in device columns, two front screens reduce the scanning range: 25 m × 0.85 = 21.25 m

### Mounting systems

Figure	Description	Packing unit	Type	Part no.
	For floor mounting	1	Adjusting plate	4031053
			Steel fixing bolt	5308961

## Dimensional drawings

### Device columns

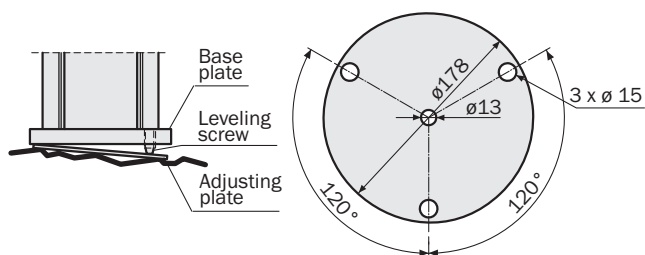


Number of beams	L1	L2	L3	L5	Part no.
2	400	500	-	1223	2019654
2	400	500	-	1223	2023707
3	300	400	400	1223	2020800
3	300	400	400	1223	2025441

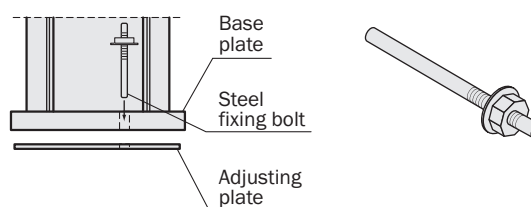
Dimensions in mm

### Mounting systems

#### Adjusting plate



#### Steel fixing bolt



Dimensions in mm

## Electro-mechanical safety switches

### Safely equipped for all cases

For the protection of your machine or system, SICK offers you a variety of safety switches: From safety position switches in corrosion-resistant metal housing to safety locking devices in compact plastic housing.

The appropriate safe control solution is also available from SICK.



#### Safety position switches and safety hinge switches

- Position switches ensure safe position monitoring even for very fast movements or where exact positions must be determined.
- Safety hinge switches check that pivotal protective devices are closed.



#### Safety switches with separate actuator

- Sliding and rotating doors as well as removable protective covers are protected with safety switches with separate actuator.
- SICK offers various designs for different demands: from compact to standard.







#### Safety locking devices

- Safety locking devices are used whenever the immediate opening of doors is not allowed; either because delayed stopping poses a danger to persons or because an uncontrolled intervention into a process could lead to grave consequences.
- The locked state is indicated via an LED or detected by the signalling contact.

# K



Model safety application	Housing material	Type of actuator	Number of positive action N/C contacts / N/O contacts	Design	Maximum locking force	Locking type <sup>2)</sup>	Product	Page
Safety switch with separate actuator 	Plastic	Separate actuator	2/1	Small	—	—	i11S	K-2
			1/1 ; 2/0 ; 2/1	Small	—	—	i12S	K-6
			1/1 ; 2/0	Compact	—	—	i16S	K-11
			2/1	Compact	—	—	i17S	K-17
			2/0	Compact	—	—	i18S AS-i	K-22
	Metal	Separate actuator	2/2 ; 3/1	According to EN 50041	—	—	i110S	K-28
Safety locking device 	Plastic	Separate actuator	2/0 + 1/1 <sup>1)</sup>	Narrow	1300 N	m/e	i10 Lock	K-34
			2/0 + 2/0 <sup>1)</sup>					
			2/1 + 1/0 <sup>1)</sup>	Narrow	1300 N	m/e	i10 Lock AS-i	K-42
			2/0 + 2/0 <sup>1)</sup>					
			2/1 ; 3/0	Small	1200 N	m	i14 Lock	K-49
			1/0 + 1/1 <sup>1)</sup> ; 1/0 + 2/0 <sup>1)</sup>	Small	2000 N	m/e	i15 Lock	K-54
1/1 + 2/1 <sup>1)</sup> ; 2/0 + 2/1 <sup>1)</sup>	Compact	1500 N	m/e	i200 Lock	K-60			
Safety position switch 	Plastic	Roller plunger	2/1	According to EN 50047	—	—	i10P	K-66
		Turning lever	2/1	According to EN 50047	—	—	i10R	K-69
	Metal	Roller plunger	1/1 ; 2/2 ; 3/1	According to EN 50041	—	—	i110P	K-72
		Turning lever	1/1 ; 2/2 ; 3/1	According to EN 50041	—	—	i110R	K-75
Safety hinge switch 	Plastic	Solid shaft	1/1 ; 2/1	According to EN 50047	—	—	i10H	K-78
	Metal	Hollow shaft	2/1	Robust	—	—	i110H	K-81

<sup>1)</sup> Number of N/C and N/O contacts for solenoid monitoring + number of N/C and N/O contacts for door monitoring

<sup>2)</sup> m = mechanical, e = electrical



- Glass-fiber reinforced thermoplastic housing
- Five actuating directions
- Cable gland M16
- Enclosure rating IP 67



## Technical data overview

Number of positive action N/C contacts	2
Number of N/O contacts	1
Type of actuator	Separate actuator
Housing material	Plastic
Number of cable entries	3
Size of the cable gland	M16
Locking force	10 N

## Product description

- Safety switches with remote multi-coded actuator
- 3 contacts
- Miniature design – ideal for direct mounting on framework

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	1	i11-S213	6022583

Please order actuator separately

Further information	Page
→ Dimensional drawings	K-4
→ Switching elements	K-4
→ Actuators	K-4
→ Accessories	K-5
→ Systematic safety	A-0
→ Services	B-0

K



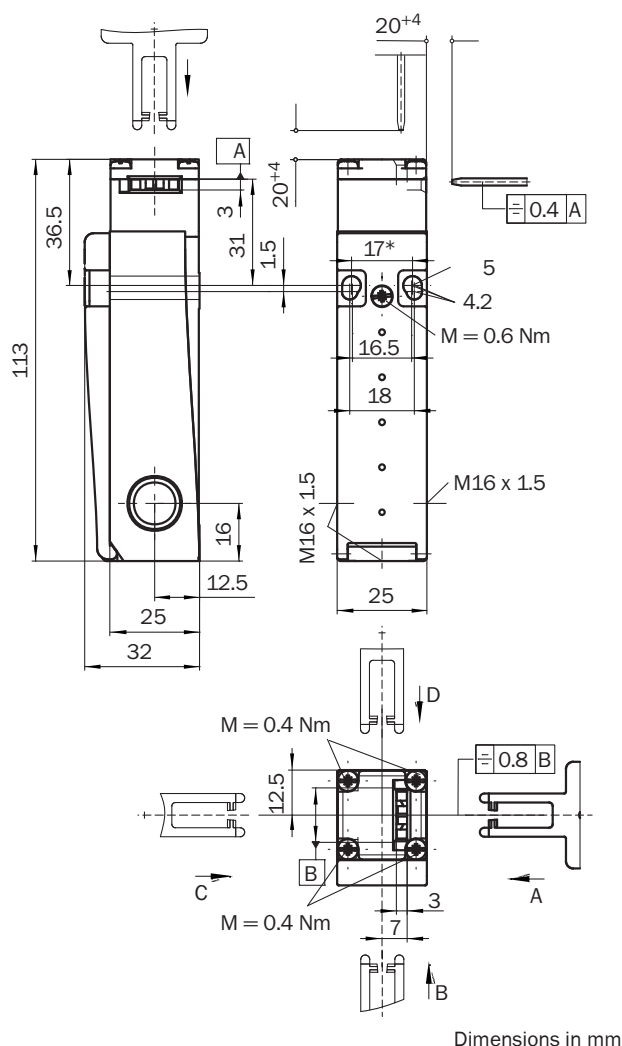
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

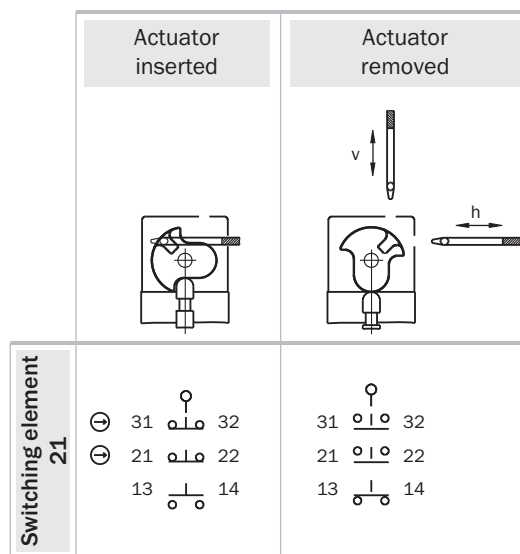
Housing material	Glass-fiber reinforced thermoplastic
Enclosure rating	IP 67
Safety related parameters	
<b>B<sub>10d</sub> parameter</b>	4 x 10 <sup>6</sup> switching cycles, with small load
Mechanical life	1 x 10 <sup>6</sup> switching cycles
Ambient operating temperature from ... to	-20 °C ... +80 °C
Maximum approach speed	20 m/min
Locking force	10 N
Actuation frequency	Max. 7000/h
Switching principle	Slow action switching element
Number of positive action N/C contacts	2
Number of N/O contacts	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13
Rated operating current (voltage)	4 A (230 V AC), 4 A (24 V DC)
Rated insulation voltage U <sub>i</sub>	250 V
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC
Minimum switching voltage	12 V DC
Minimum switching current (switching voltage)	1 mA (24 V DC)
Connection type	Cable gland
Number of cable glands x size of the screwed joint	3 x M16
Maximum connection cable cross-section	1.5 mm <sup>2</sup>
Short-circuit protection	4 A gG
Weight	0.1 kg



### Dimensional drawings



### Switching elements



**Switching element 21:**  
2 positive action N/C contacts + 1 N/O contact

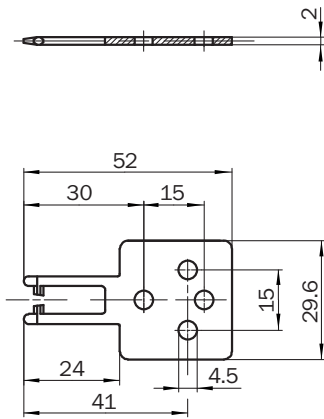


### Actuators <sup>1)</sup>

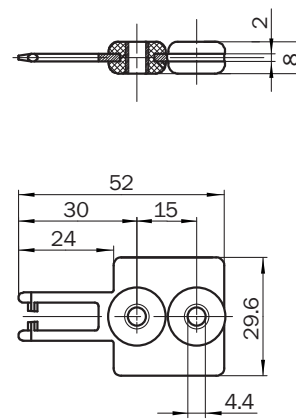
Figure	Design	Actuation option	Method of actuation	Min. door radius	Type	Part no.
	Straight	Rigid	-	150 mm	iE11-S1	5306537
		Rubber-mounted	In line	150 mm	iE11-S2	5306539
			Transverse	150 mm	iE11-S3	5306540
	Angled	Rigid	-	150 mm	iE11-A1	5306538
		Rubber-mounted	Transverse	150 mm	iE11-A2	5306541

<sup>1)</sup> Including 2 safety screws M4 x 14

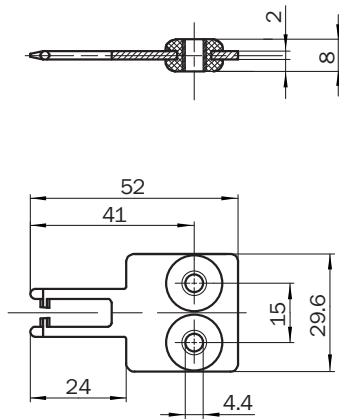
iE11-S1



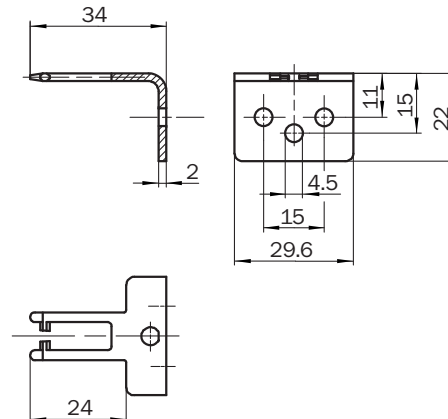
iE11-S2



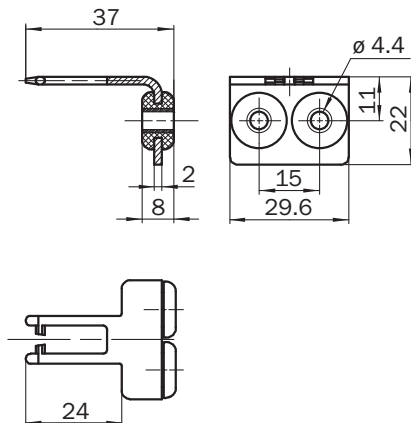
iE11-S3



iE11-A1



iE11-A2



K

Dimensions in mm

## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M16	5309163



- Glass-fiber reinforced thermoplastic housing
- Five actuating directions
- Cable gland M16
- Two designs: Miniature housing and design according to EN 50047
- Enclosure rating IP 67



K

Further information	Page
→ Dimensional drawings	K-8
→ Switching elements	K-9
→ Actuator travel diagram	K-9
→ Actuators	K-10
→ Accessories	K-10
→ Systematic safety	A-0
→ Services	B-0

## Technical data overview

Number of positive action N/C contacts (depending on type)	1 / 2
Number of N/O contacts (depending on type)	0 / 1
Type of actuator	Separate actuator
Housing material	Plastic
Number of cable entries	1
Size of the cable gland	M16
Locking force (depending on type)	15 N / 6 N

## Product description

- Safety switches with remote multi-coded actuator
- 2 or 3 contacts
- Miniature version – ideal for direct mounting on framework
- Suitable for very small door radius (60 mm), with appropriate actuator.

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
1	1	i12-SA113	6025057
2	0	i12-SA203	6025100
	1	i12-SB213	6025059

Please order actuator separately

## Technical specifications

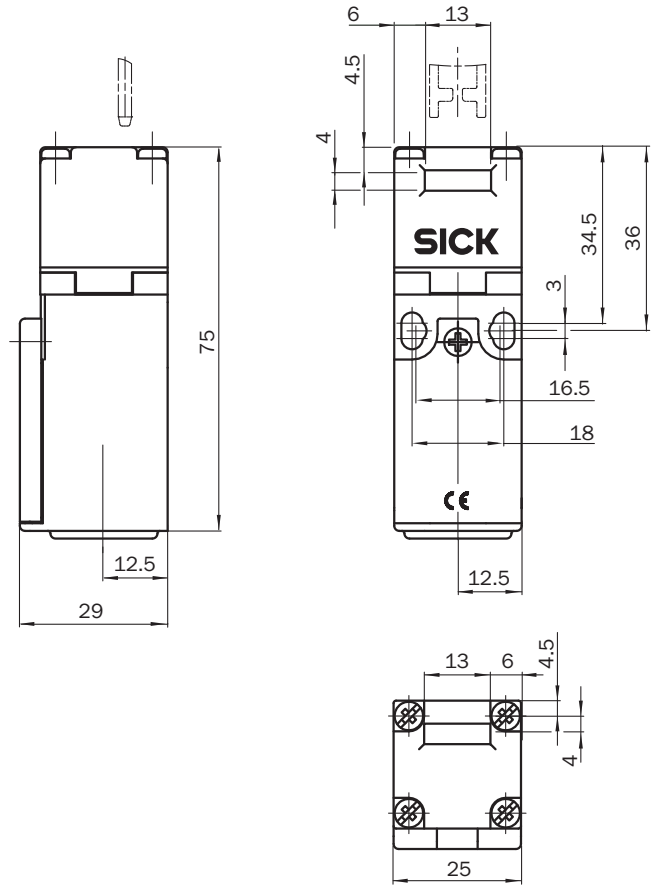
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i12-SA113	i12-SA203	i12-SB213
Housing material	Glass-fiber reinforced thermoplastic		
Enclosure rating	IP 67		
Safety related parameters			
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load		
Mechanical life	1 x 10 <sup>6</sup> switching cycles		
Ambient operating temperature from ... to	-20 °C ... +80 °C		
Maximum approach speed	10 m/min		
Locking force	6 N		15 N
Actuation frequency	Max. 7200/h		
Switching principle	Slow action switching element		
Number of positive action N/C contacts	1	2	
Number of N/O contacts	1	0	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13		
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)		
Rated insulation voltage U <sub>i</sub>	240 V		
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC		
Minimum switching voltage	5 V DC		
Minimum switching current (switching voltage)	5 mA (5 V DC)		
Connection type	Cable gland		
Number of cable glands x size of the screwed joint	1 x M16		
Maximum connection cable cross-section	1.5 mm <sup>2</sup>		
Short-circuit protection	3 A gG		
Weight	0.08 kg		0.11 kg

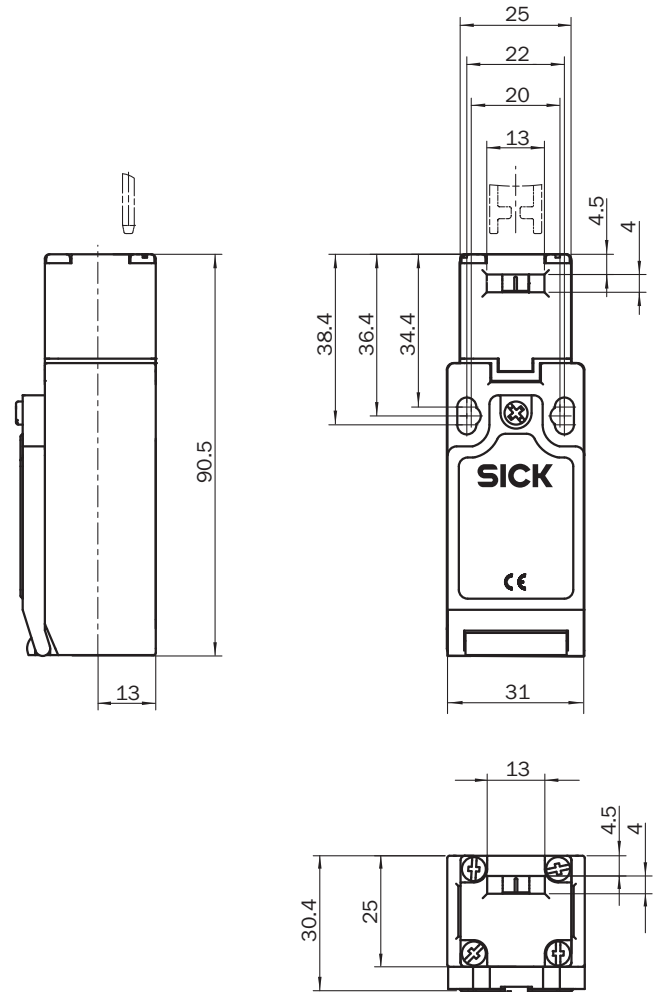


## Dimensional drawings

i12-SA113, i12-SA203



i12-SB213



Dimensions in mm

K

## Switching elements

	Actuator inserted	Actuator removed
Switching element 11		
Switching element 20		
Switching element 21		

**Switching element 11:**

1 positive action N/C contact + 1 N/O contact

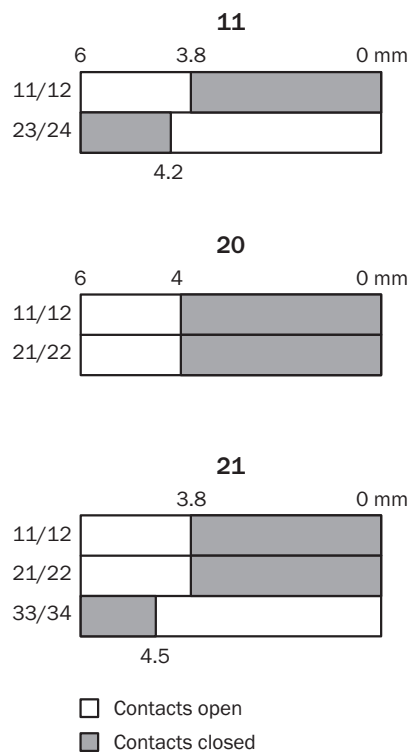
**Switching element 20:**

2 positive action N/C contacts

**Switching element 21:**

2 positive action N/C contacts + 1 N/O contact

## Actuator travel diagram



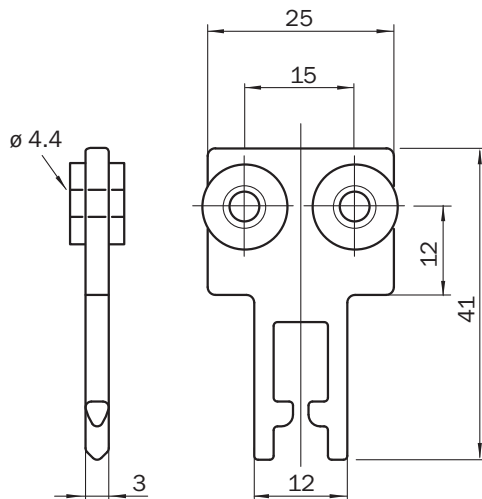
Contact action over the entire actuator withdrawal distance (full insertion = 0 mm)



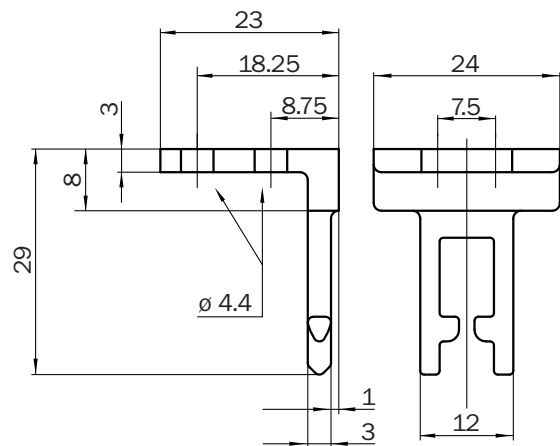
## Actuators

Figure	Design	Actuation option	Min. door radius	Type	Part no.
	Straight	Rubber-mounted	150 mm	iE12-S1	5311131
	Angled	Rigid	150 mm	iE12-A1	5311132
	Radial	Semiflexible	60 mm	iE12-F1	5308842

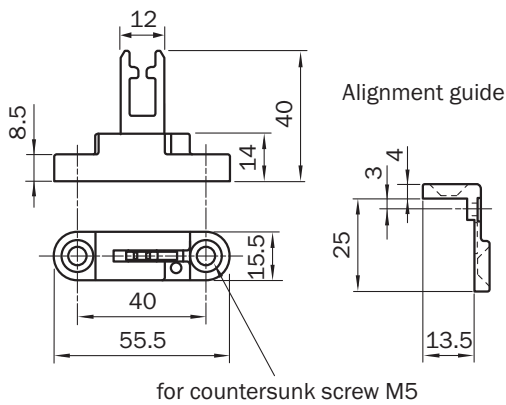
### iE12-S1



### iE12-A1




### iE12-F1



Dimensions in mm

## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M16	5309163



## Technical data overview

Number of positive action N/C contacts (depending on type)	1 / 2
Number of N/O contacts (depending on type)	0 / 1
Type of actuator	Separate actuator
Housing material	Plastic
Number of cable entries	3
Size of the cable gland	M20
Locking force	30 N

## Product description

- Safety switches with remote multi-coded actuator
- 2 contacts
- Adjustable rotating head allows for multiple actuating directions

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

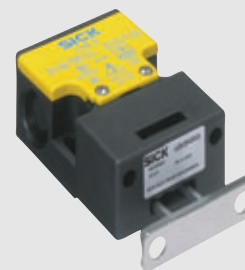
### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
1	1	i16-SA113	6025065
2	0	i16-SA203	6025063

Please order actuator separately



- Glass-fiber reinforced thermoplastic housing
- Three actuating directions
- 30 N locking force
- Enclosure rating IP 67



# K

Further information	Page
→ Technical specifications	K-12
→ Dimensional drawings	K-13
→ Switching elements	K-14
→ Actuator travel diagram	K-14
→ Actuators	K-15
→ Catch and retainer kit	K-16
→ Accessories	K-16
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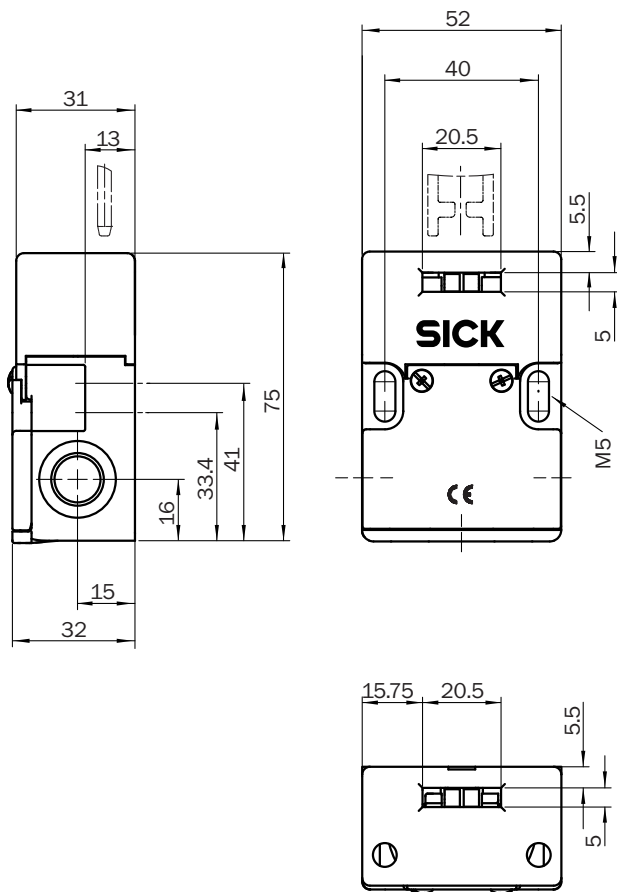
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i16-SA113	i16-SA203
Housing material	Glass-fiber reinforced polybutylene terephthalate (PBT)	
Enclosure rating	IP 67	
Safety related parameters		
B <sub>10d</sub> parameter	2 x 10 <sup>6</sup> switching cycles, with small load	
Mechanical life	1 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	-20 °C ... +80 °C	
Maximum approach speed	10 m/min	
Locking force	30 N	
Actuation frequency	Max. 7200/h	
Switching principle	Slow action switching element	
Number of positive action N/C contacts	1	2
Number of N/O contacts	1	0
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13	
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)	
Rated insulation voltage U <sub>i</sub>	240 V	
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC	
Minimum switching voltage	5 V DC	
Minimum switching current (switching voltage)	5 mA (5 V DC)	
Connection type	Cable gland	
Number of cable glands x size of the screwed joint	3 x M20	
Maximum connection cable cross-section	1.5 mm <sup>2</sup>	
Short-circuit protection	3 A gG	
Weight	0.14 kg	



## Dimensional drawings



Dimensions in mm



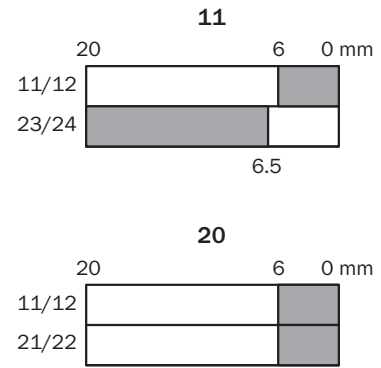
### Switching elements

	Actuator inserted	Actuator removed
Switching element 11		
Switching element 20		

**Switching element 11:**  
1 positive action N/C contact + 1 N/O contact

**Switching element 20:**  
2 positive action N/C contacts

### Actuator travel diagram






- Contacts open
- Contacts closed

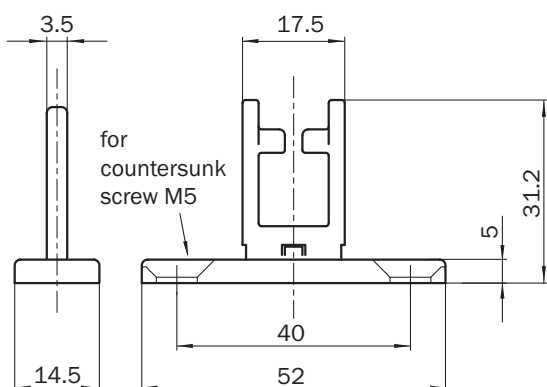
Contact action over the entire actuator withdrawal distance  
(full insertion = 0 mm)



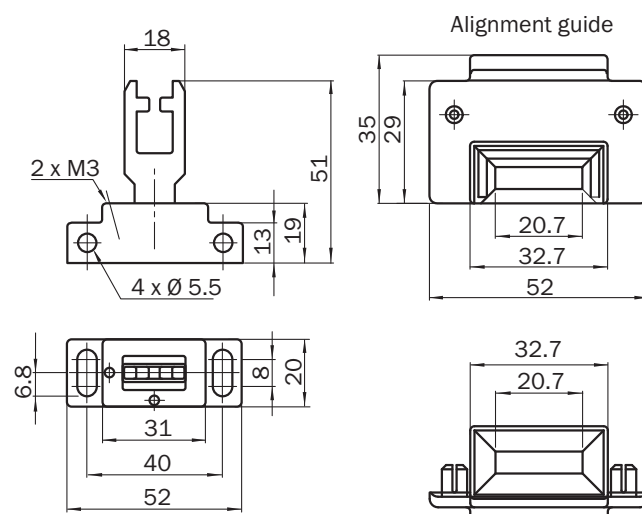
## Actuators

Figure	Design	Actuation option	Min. door radius	Type	Part no.
	Straight	Rigid	175 mm	iE16-S1	5311128
	Radial	Fully flexible	60 mm	iE16-F1	5311129
		Semiflexible	60 mm	iE16-F2	5311278

### iE16-S1

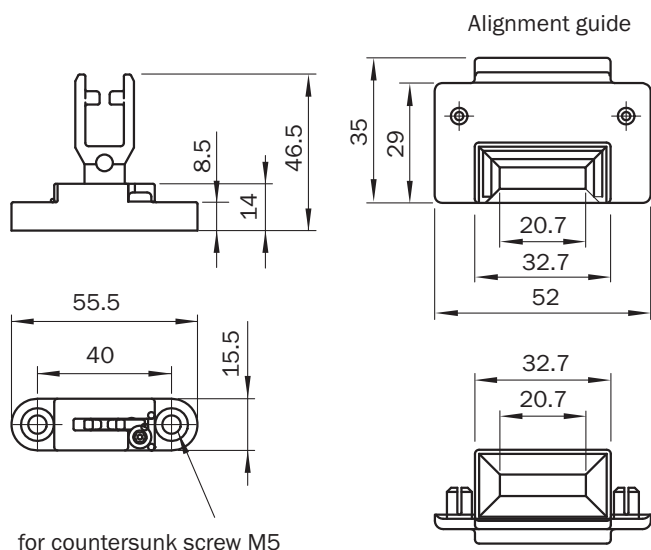


### iE16-F1



Fully flexible method of actuation: The actuator facilitates movement in both horizontal and vertical planes.

### iE16-F2



Semiflexible method of actuation: The actuator facilitates movement in the horizontal plane only.

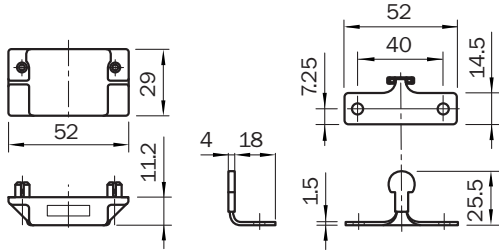
Dimensions in mm



## Catch and retainer kit

Figure	Type	Part no.
	iE16-SCR	5310780

### iE16-SCR




- An increase in the locking force to 50 N.
- Only in connection with rigid actuators.

Dimensions in mm

## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164

## Technical data overview

Number of positive action N/C contacts	2
Number of N/O contacts	1
Type of actuator	Separate actuator
Housing material	Plastic
Number of cable entries	3
Size of the cable gland	M20
Locking force	12 N

## Product description

- Safety switch with remote multi-coded actuator
- 3 contacts
- Adjustable rotating head allows for multiple actuating directions

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	1	i17-SA213	6025067

Please order actuator separately



- Glass-fiber reinforced thermoplastic housing
- Three actuating directions
- Cable gland 3 x M20
- Enclosure rating IP 67



# K

Further information	Page
→ Technical specifications	K-18
→ Dimensional drawings	K-19
→ Switching elements	K-19
→ Actuator travel diagram	K-19
→ Actuators	K-20
→ Catch and retainer kit	K-21
→ Accessories	K-21
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

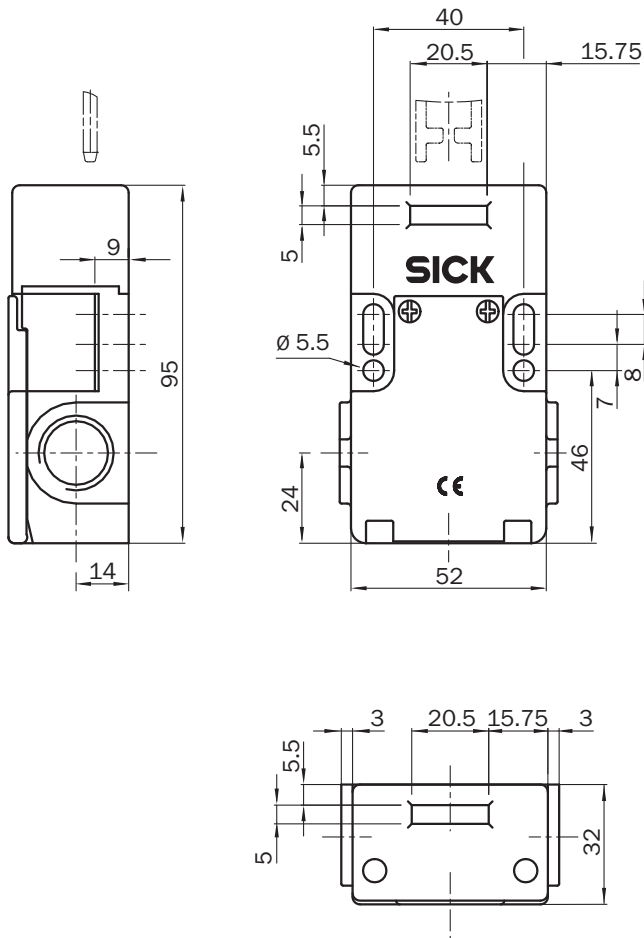
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Housing material	Glass-fiber reinforced thermoplastic
Enclosure rating	IP 67
Safety related parameters	
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load
Mechanical life	1 x 10 <sup>6</sup> switching cycles
Ambient operating temperature from ... to	-20 °C ... +80 °C
Maximum approach speed	10 m/min
Locking force	12 N
Actuation frequency	Max. 7200/h
Switching principle	Slow action switching element
Number of positive action N/C contacts	2
Number of N/O contacts	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13
Rated operating current (voltage)	3 A (240 V AC), 2 A (24 V DC)
Rated insulation voltage U <sub>i</sub>	240 V
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC
Minimum switching voltage	5 V DC
Minimum switching current (switching voltage)	5 mA (5 V DC)
Connection type	Cable gland
Number of cable glands x size of the screwed joint	3 x M20
Maximum connection cable cross-section	1.5 mm <sup>2</sup>
Short-circuit protection	2 A gG
Weight	0.19 kg





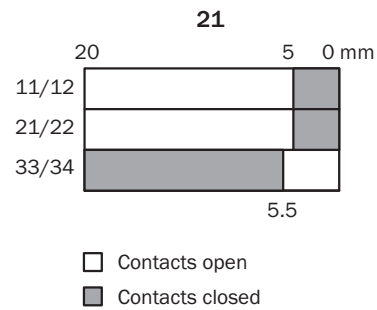
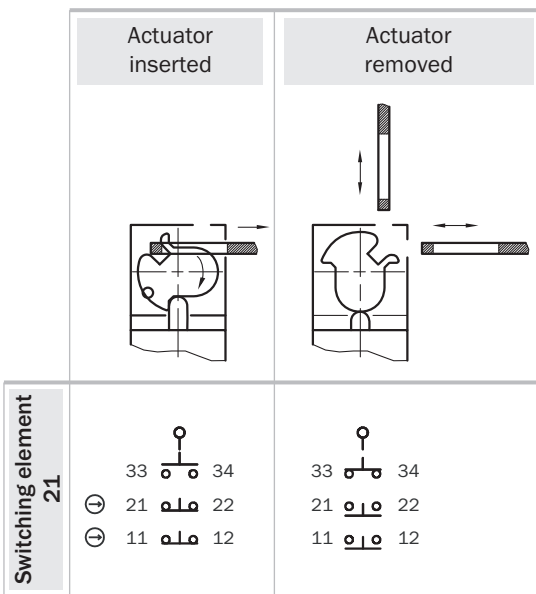
### Dimensional drawings



Dimensions in mm

### Switching elements




### Actuator travel diagram



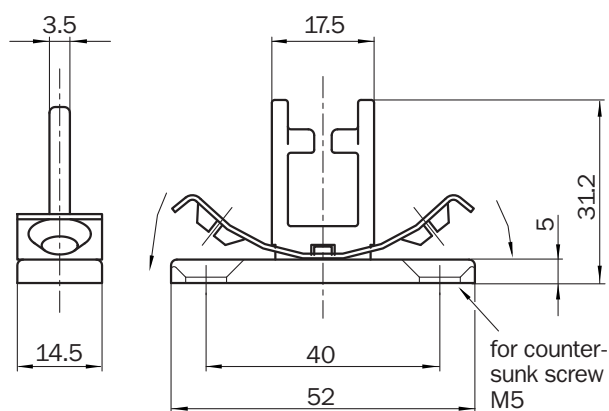
Contact action over the entire actuator withdrawal distance (full insertion = 0 mm)

**Switching element 21:**  
2 positive action N/C contacts + 1 N/O contact

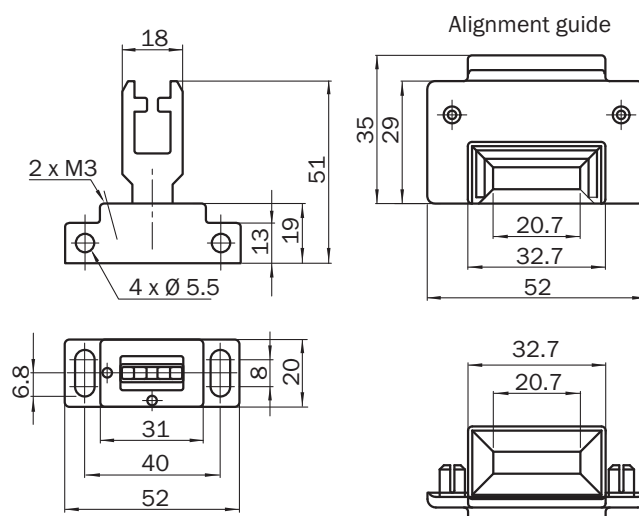
## Actuators

Figure	Design	Actuation option	Method of actuation	Min. door radius	Type	Part no.
	Straight	Rigid	Self ejecting against simple manipulation	175 mm	iE17-S1	5311130
	Radial	Fully flexible	-	60 mm	iE16-F1	5311129
		Semiflexible	-	60 mm	iE16-F2	5311278

### iE17-S1

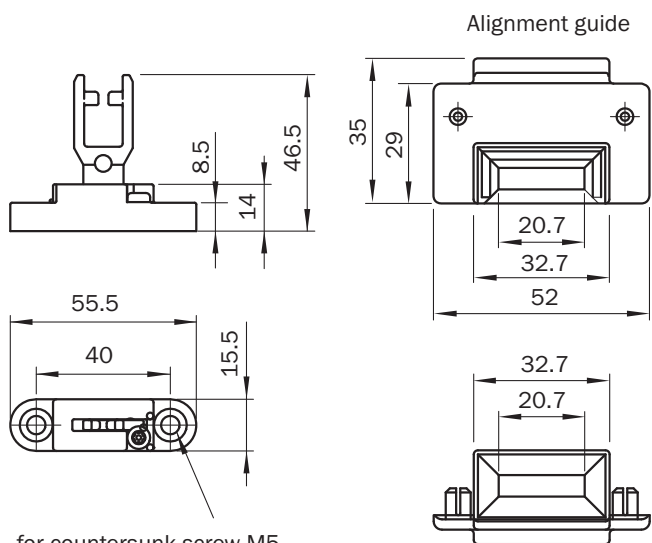


### iE16-F1



Fully flexible method of actuation: The actuator facilitates movement in both horizontal and vertical planes.

### iE16-F2



Semiflexible method of actuation: The actuator facilitates movement in the horizontal plane only.

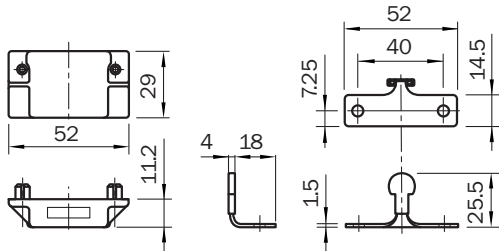
Dimensions in mm

K

## Catch and retainer kit

Figure	Type	Part no.
	iE16-SCR	5310780

### iE16-SCR




- An increase in the locking force to 50 N.
- Only in connection with rigid actuators.

Dimensions in mm

## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



- Glass-fiber reinforced thermoplastic housing
- Integrated AS-Interface
- AS-Interface M12 connection
- Enclosure rating IP 67



## Technical data overview

Fieldbus	AS-Interface Safety at Work
Number of positive action N/C contacts	2
Number of N/O contacts	0
Type of actuator	Separate actuator
Housing material	Plastic
Number of cable entries	1
Size of the cable gland	M12
Locking force	25 N

## Product description

- Safety switch with remote multi-coded actuator
- 2 positive action normally closed contacts via M12 AS-Interface connection
- Small design – ideal for direct mounting on framework
- Various actuator versions available

## Applications



## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	0	i18-S205	6034058

Please order actuator separately

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→ Dimensional drawings	K-24
→ Actuators	K-25
→ Alignment guide	K-27
→ Accessories	K-27
→ Systematic safety	A-0
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K

## Technical specifications

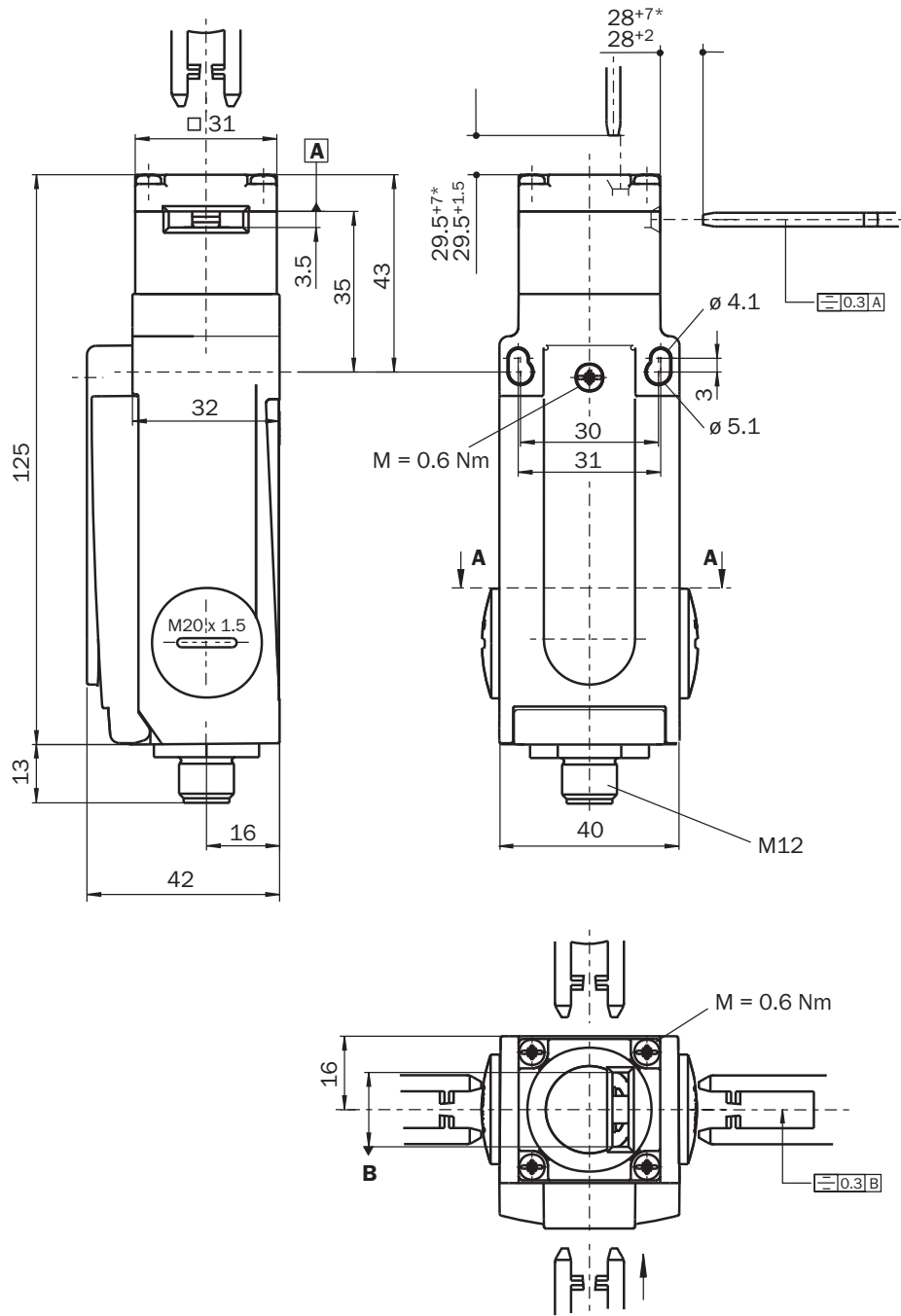
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Housing material		Glass-fiber reinforced thermoplastic
Enclosure rating		IP 67 <sup>1)</sup>
Safety related parameters	<b>B<sub>10d</sub> parameter</b>	3 x 10 <sup>6</sup> switching cycles, with small load
Mechanical life		2 x 10 <sup>6</sup> switching cycles
Ambient operating temperature from ... to		-20 °C ... +55 °C
Maximum approach speed		20 m/min
Actuation force		8 N
Locking force		25 N
Switching principle		Slow action switching element
Number of positive action N/C contacts		2
Number of N/O contacts		0
Connection type		Connector
Number of cable glands x size of the screwed joint		1 x M12
Fieldbus		AS-Interface Safety at Work
AS-Interface master version		2.1
AS-Interface addresses		1 ... 31
AS-interface power consumption		Max. 45 mA
Data bits IN	<b>Positive action N/C contact 1</b> <b>Positive action N/C contact 2</b>	AS-Interface Safety at Work code sequence on D0, D1 AS-Interface Safety at Work code sequence on D2, D3
Weight		0.215 kg

<sup>1)</sup> Mating plug inserted



Dimensional drawings










\* In case of actuator with overtravel

Dimensions in mm

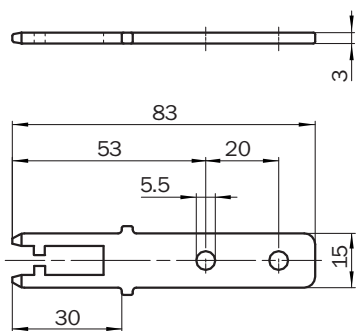
K

## Actuators <sup>1)</sup>

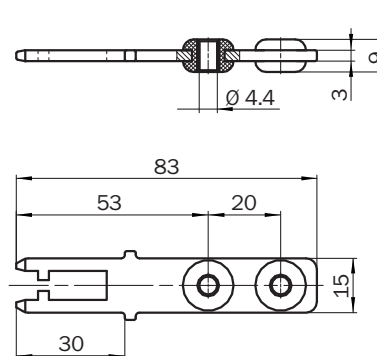
Figure	Design	Actuation option	Method of actuation	Min. door radius	Type	Part no.
	Straight	Rigid	-	1000 mm	IE10-S1	5306527
		Rubber-mounted	-	1000 mm	IE10-S2	5306530
		Rigid	With overtravel	1000 mm	IE10-S4	5308383
	Angled	Rigid	-	1000 mm	IE10-A1	5306535
			With overtravel	1000 mm	IE10-A4	5308497
	Radial	Semiflexible	Door hinged at top/ bottom	90 mm	IE10-R1	5306528
			Door hinged on left/right	100 mm	IE10-R2	5306529

<sup>1)</sup> Including 2 safety screws

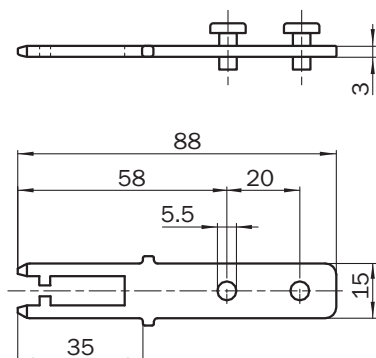
### iE10-S1



### iE10-S2

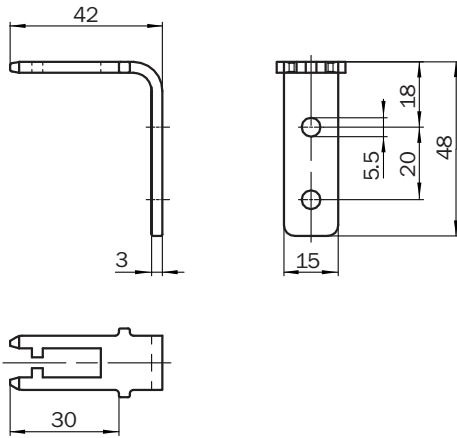


### iE10-S4

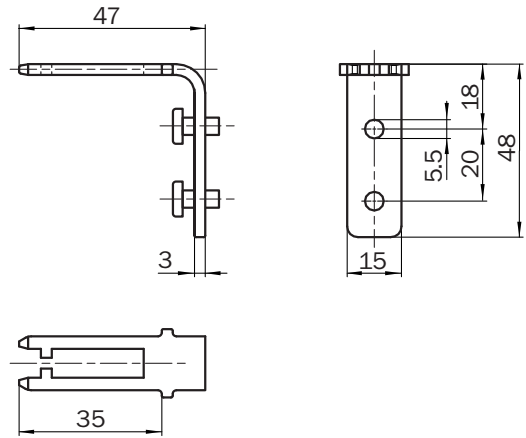


Dimensions in mm

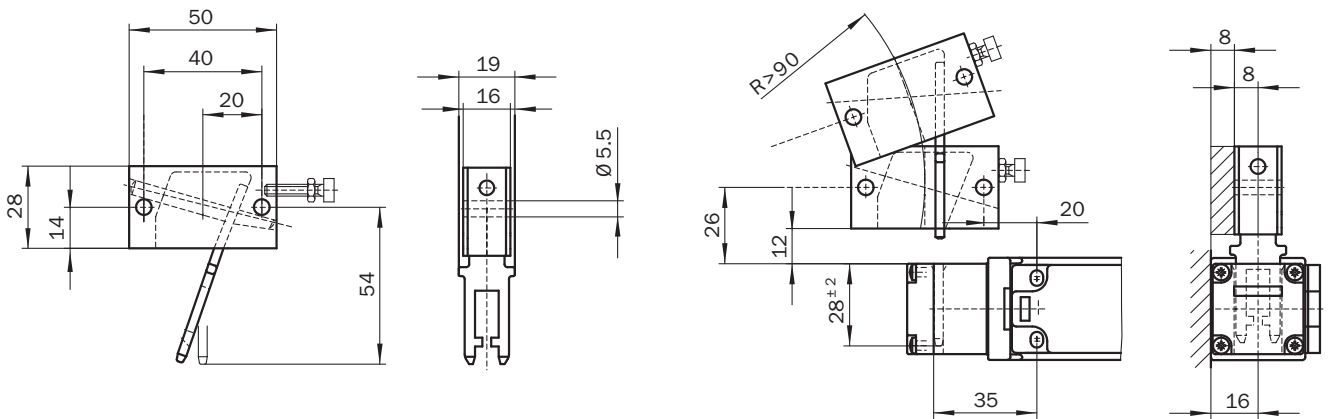
iE10-A1



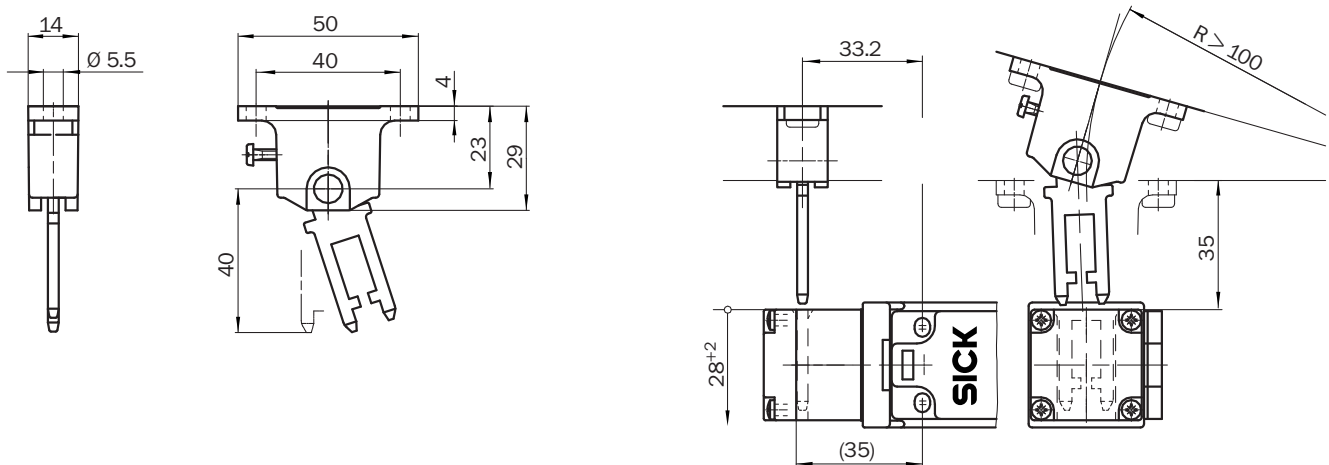
iE10-A4



iE10-R1



iE10-R2




Dimensions in mm

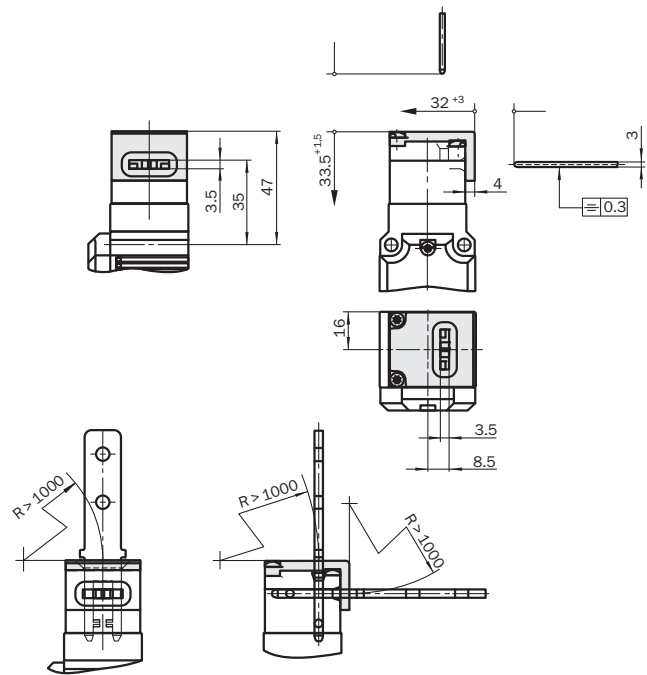




## Alignment guide

Figure	Type	Part no.
	iE10-G1	5318460

### iE10-G1



Dimensions in mm

The metal alignment guide provides the actuator with a wider entry area into the safety switch. With the alignment guide, the safety switch is better protected against damage.


It can be secured to the safety switch with the two M3 x 34 self-tapping screws (screws supplied with delivery).

It can only be used in combination with actuators with overtravel (iE10-A4, iE10-S4).

It can not be used with special locking devices (i10-E0313S02), which already have a longer top entry overtravel.

## Accessories

### Connecting cable

Figure	Direction of cable outlet	Connection type	Cable length	Part no.
	Straight	Plug M12 x 5	2 m	6026133
			5 m	6026134

### AS-Interface accessories

Description	Type	Part no.
AS-i Clip	ASI-M12	6022472



- Die-cast zinc housing
- Five actuating directions
- Cable gland M20
- Enclosure rating IP 67
- Design according to EN 50041



K

## Technical data overview

Number of positive action N/C contacts (depending on type)	2 / 3
Number of N/O contacts (depending on type)	1 / 2
Type of actuator	Separate actuator
Housing material	Metal
Number of cable entries	1
Size of the cable gland	M20
Locking force	12 N

## Product description

- Safety switches with remote multi-coded actuator
- 4 contacts
- Small door radius (175 mm) possible even with standard actuator

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	2	i110-SA223	6025074
3	1	i110-SA313	6025073

Please order actuator separately

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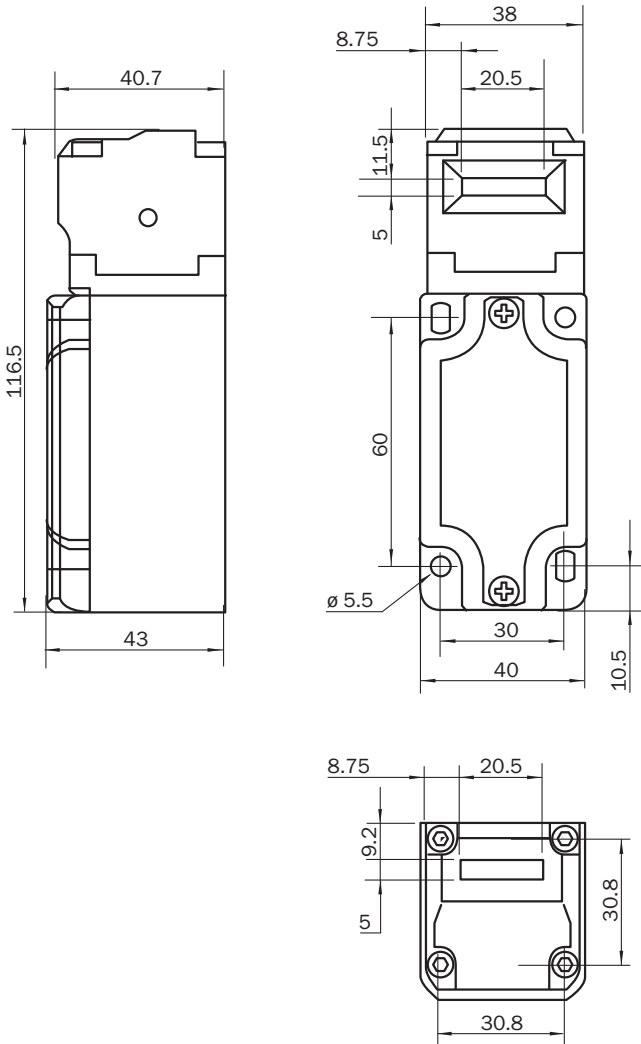
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i110-SA223	i110-SA313
Housing material	Die-cast zinc	
Surface treatment	Varnished	
Enclosure rating	IP 67	
Safety related parameters		
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load	
Mechanical life	1 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	-20 °C ... +80 °C	
Maximum approach speed	10 m/min	
Locking force	12 N	
Actuation frequency	Max. 7200/h	
Switching principle	Slow action switching element	
Number of positive action N/C contacts	2	3
Number of N/O contacts	2	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13	
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)	
Rated insulation voltage U <sub>i</sub>	240 V	
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC	
Minimum switching voltage	5 V DC	
Minimum switching current (switching voltage)	5 mA (5 V DC)	
Connection type	Cable gland	
Number of cable glands x size of the screwed joint	1 x M20	
Maximum connection cable cross-section	1.5 mm <sup>2</sup>	
Short-circuit protection	3 A gG	
Weight	0.54 kg	



Dimensional drawings



Dimensions in mm



## Switching elements

	Actuator inserted	Actuator removed
<b>Switching element 22</b>		
<b>Switching element 31</b>		

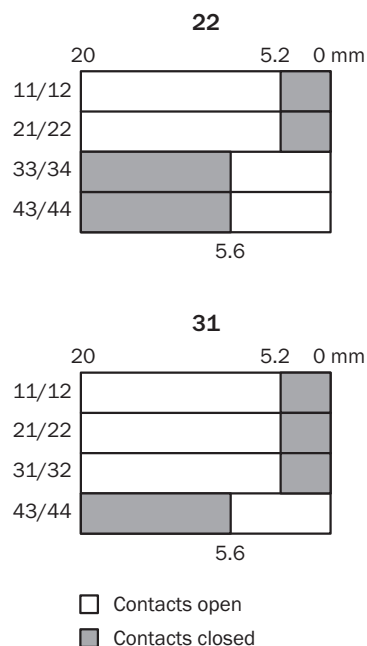
**Switching element 22:**

2 positive action N/C contacts + 2 N/O contacts

**Switching element 31:**

3 positive action N/C contacts + 1 N/O contact



## Actuator travel diagram



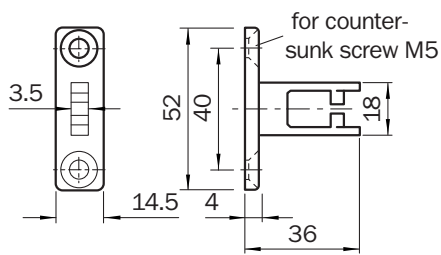
Contact action over the entire actuator withdrawal distance  
(full insertion = 0 mm)



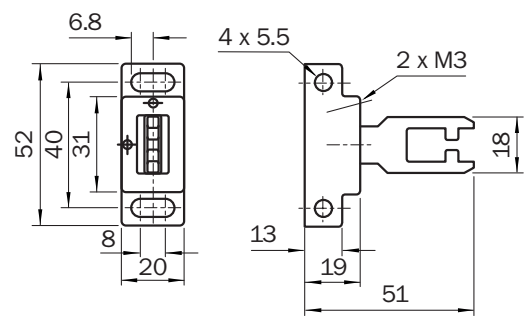
## Actuators

Figure	Design	Actuation option	Min. door radius	Type	Part no.
	Straight	Rigid	175 mm	iE200-S1	5308758
	Radial	Fully flexible	80 mm	iE200-F1	5308759
	Bolt actuator straight	Rigid	175 mm	iE200-B1	5308760

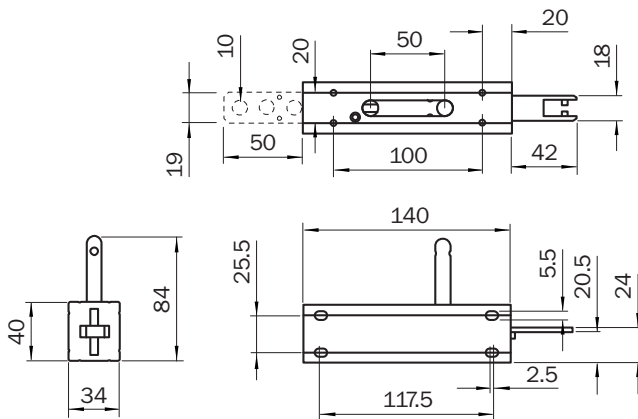
iE200-S1



iE200-F1



iE200-B1




Dimensions in mm

K

## Accessories

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### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



- Glass-fiber reinforced thermoplastic housing
- Five actuating directions
- Cable gland 3 x M20
- Enclosure rating IP 67



K

Further information	Page
→ Dimensional drawings	K-36
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→ Actuators	K-38
→ Lock	K-40
→ Alignment guide	K-40
→ Accessories	K-41
→ Systematic safety	A-0
→ Services	B-0

## Technical data overview

Number of positive action N/C solenoid monitoring contacts	2
Number of N/O solenoid monitoring contacts (depending on type)	0 / 1
Number of positive action N/C door monitoring contacts (depending on type)	0 / 1 / 2
Number of N/O door monitoring contacts (depending on type)	0 / 1
Number of N/C door monitoring contacts (depending on type)	0 / 1
Housing material	Plastic
Maximum locking force	1300 N
Locking type (depending on type)	Electrical / mechanical

## Product description

- Safety switches with remote multi-coded actuator and tumbler mechanism
- Small design – ideal for direct mounting on framework
- 4 contacts
- Various actuator versions available

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

- Solenoid operating voltage: 24 V DC

Locking type	Solenoid monitoring contacts		Door monitoring contacts			Type	Part no.
	Number of positive action N/C	Number of N/O	Number of positive action N/C	Number of N/O	Number of N/C		
Electrical	2	1	0	0	1	i10-E0233 Lock	6022585
		0	0	1	1	i10-E0253 Lock	6020536
	2		1	1	0	i10-E0313S02 Lock	6011368
		2	0	0	0	i10-E0453 Lock	6020598
Mechanical	2	1	0	0	1	i10-M0233 Lock	6022580
		0	0	1	1	i10-M0253 Lock	6027397
	2		2	0	0	i10-M0453 Lock	6029934

Please order actuator separately



## Technical specifications

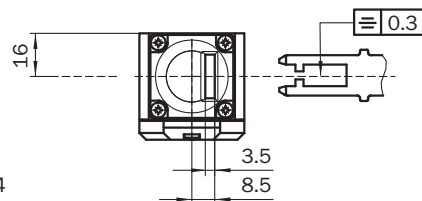
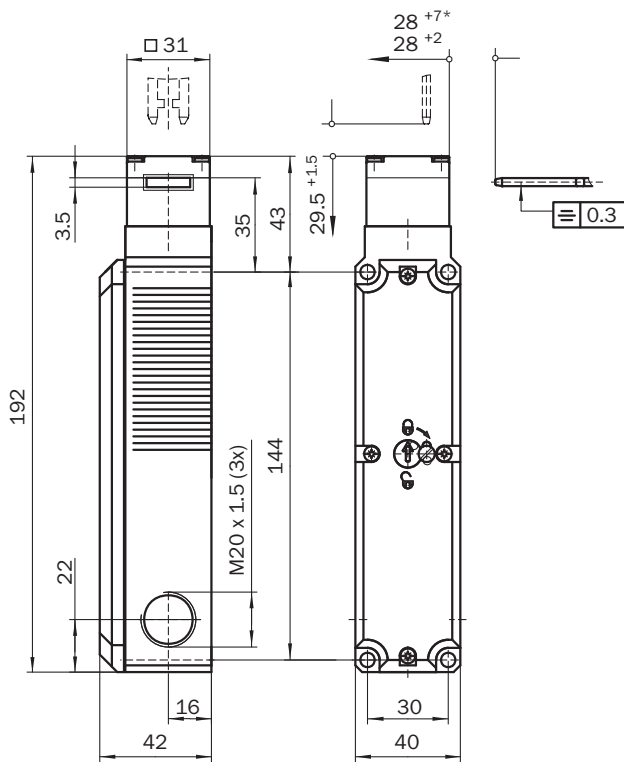
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i10-E0233 Lock	i10-E0253 Lock	i10-E0313S02 Lock	i10-E0453 Lock	i10-M0233 Lock	i10-M0253 Lock	i10-M0453 Lock
Housing material	Glass-fiber reinforced thermoplastic						
Enclosure rating	IP 67						
Safety related parameters							
$B_{10d}$ parameter	3 x 10 <sup>6</sup> switching cycles, with small load						
Mechanical life	1 x 10 <sup>6</sup> switching cycles						
Ambient operating temperature from ... to	-20 °C ... +55 °C						
Maximum approach speed	20 m/min						
Actuation force	20 N						
Maximum locking force	1300 N						
Actuation frequency	Max. 7000/h						
Switching principle	Slow action switching element						
Number of positive action N/C solenoid monitoring contacts	2						
Number of N/O solenoid monitoring contacts	1	0			1	0	
Number of positive action N/C door monitoring contacts	0		1	2	0		2
Number of N/O door monitoring contacts	0	1		0		1	0
Number of N/C door monitoring contacts	1		0		1		0
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13						
Rated operating current (voltage)	4 A (230 V AC), 4 A (24 V DC)						
Rated insulation voltage $U_i$	250 V						
Rated impulse withstand voltage $U_{imp}$	2500 V AC						
Minimum switching voltage	12 V DC						
Minimum switching current (switching voltage)	1 mA (24 V DC)						
Solenoid operating voltage	24 V (20.4 V ... 26.4 V) DC						
Power consumption	Max. 8 W						
Duty cycle	100 %						
Connection type	Cable gland						
Number of cable glands x size of the screwed joint	3 x M20						
Maximum connection cable cross-section	1.5 mm <sup>2</sup>						
Short-circuit protection	4 A gG						
Weight	0.46 kg						

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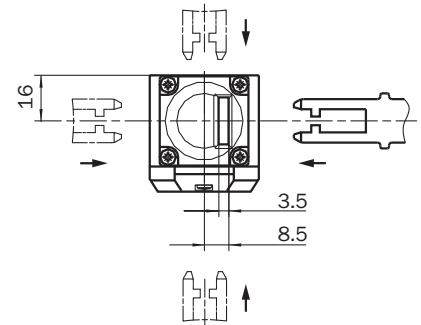
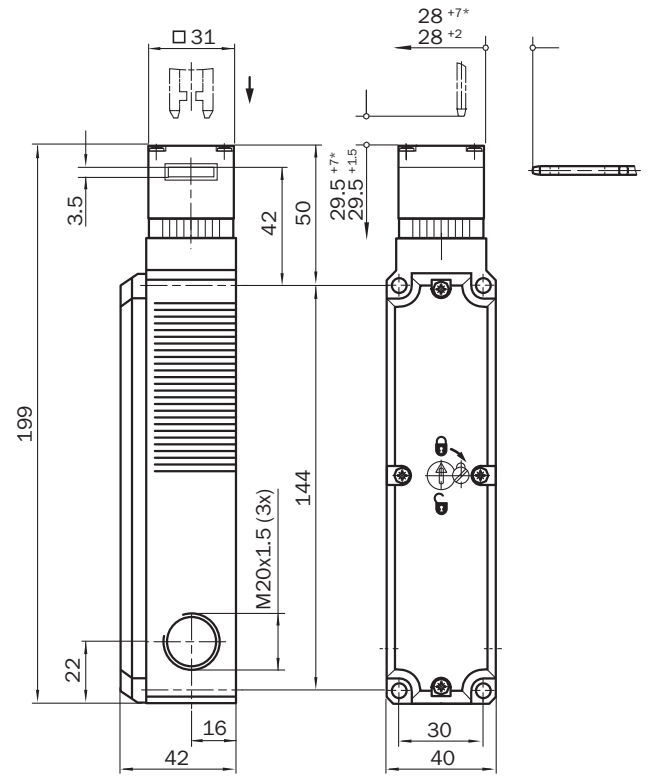
## Dimensional drawings

**i10-E0233 Lock, i10-E0253 Lock, i10-E0453 Lock,  
i10-M0233 Lock, i10-M0253 Lock, i10-M0453 Lock**



\* in case of actuator with overtravel:  
iE10-S4 and iE10-A4

**i10-E0313S02 Lock**



\* in case of actuator with overtravel:  
iE10-S4 and iE10-A4

Dimensions in mm

K

## Switching elements

	Actuator inserted		Actuator removed
	locked	unlocked	
<b>Switching element 23</b>			
	$\ominus$ 41 $\circ$ 42 $\ominus$ 33 $\circ$ 34 $\ominus$ 21 $\circ$ 22 $\ominus$ 11 $\circ$ 12	$\ominus$ 41 $\circ$ 42 $\ominus$ 33 $\circ$ 34 $\ominus$ 21 $\circ$ 22 $\ominus$ 11 $\circ$ 12	$\ominus$ 41 $\circ$ 42 $\ominus$ 33 $\circ$ 34 $\ominus$ 21 $\circ$ 22 $\ominus$ 11 $\circ$ 12
<b>Switching element 25</b>			
	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 13 $\circ$ 14	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 13 $\circ$ 14	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 13 $\circ$ 14
<b>Switching element 31</b>			
	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 13 $\circ$ 14	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 13 $\circ$ 14	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 13 $\circ$ 14
<b>Switching element 45</b>			
	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 11 $\circ$ 12	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 11 $\circ$ 12	$\ominus$ 41 $\circ$ 42 $\ominus$ 31 $\circ$ 32 $\ominus$ 21 $\circ$ 22 $\ominus$ 11 $\circ$ 12

**Switching element 23:**

2 positive action N/C contacts + 1 N/O contact +  
1 N/C as door contact

**Switching element 25:**

2 positive action N/C contacts + 1 N/O contact as  
door contact + 1 N/C as door contact

**Switching element 31:**

2 positive action N/C contacts + 1 N/O contact as  
door contact + 1 positive action N/C as door contact

**Switching element 45:**

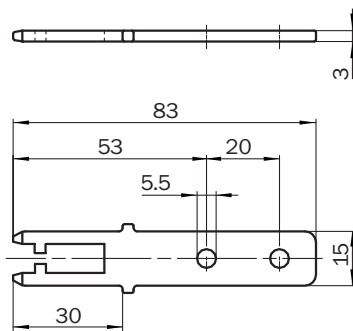
2 positive action N/C contacts +  
2 positive action N/C as door contacts

## Actuators <sup>1)</sup>

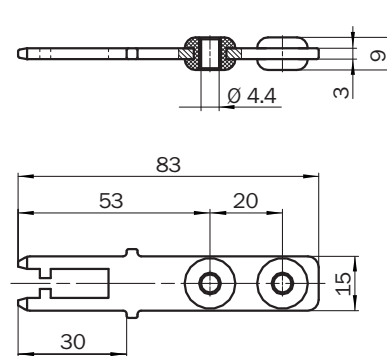
Figure	Design	Actuation option	Method of actuation	Min. door radius	Type	Part no.
	Straight	Rigid	-	1000 mm	iE10-S1	5306527
		Rubber-mounted	-	1000 mm	iE10-S2	5306530
		Rigid	With overtravel	1000 mm	iE10-S4	5308383
	Angled	Rigid	-	1000 mm	iE10-A1	5306535
			With overtravel	1000 mm	iE10-A4	5308497
	Radial	Semiflexible	Door hinged at top/ bottom	90 mm	iE10-R1	5306528
			Door hinged on left/right	100 mm	iE10-R2	5306529

<sup>1)</sup> Including 2 safety screws

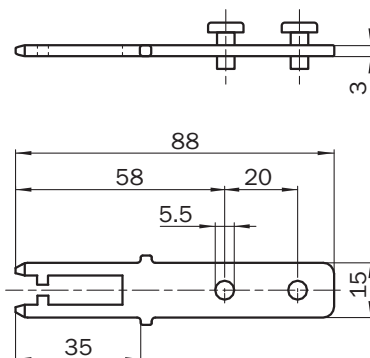
### iE10-S1



### iE10-S2

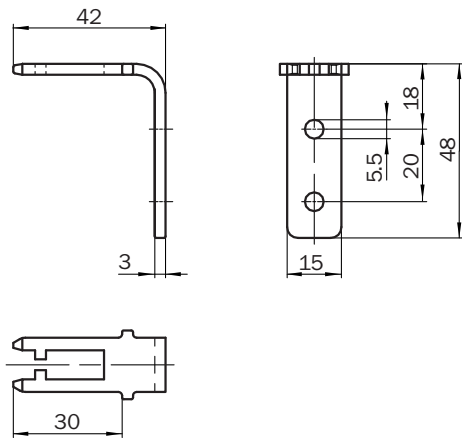


### iE10-S4

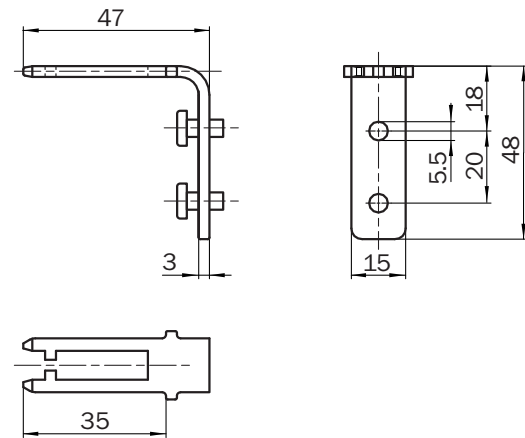


Dimensions in mm

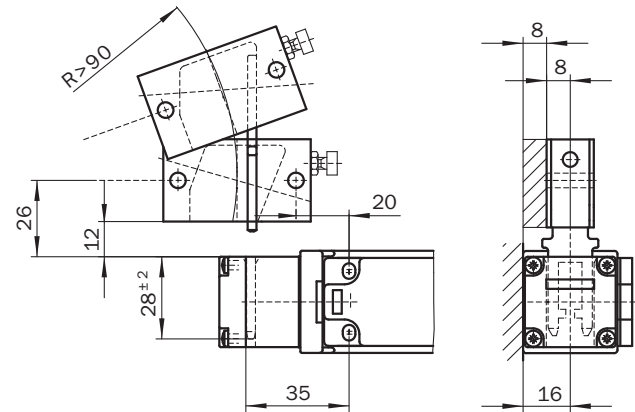
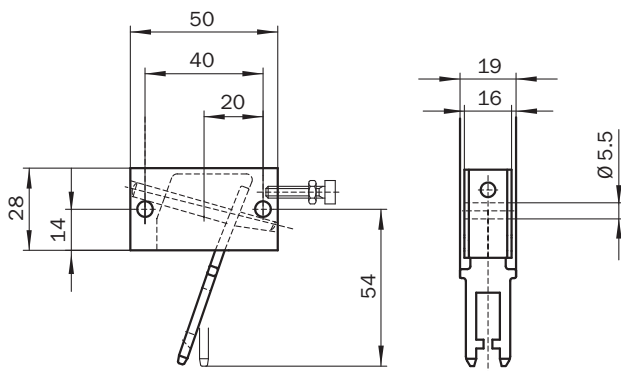
iE10-A1



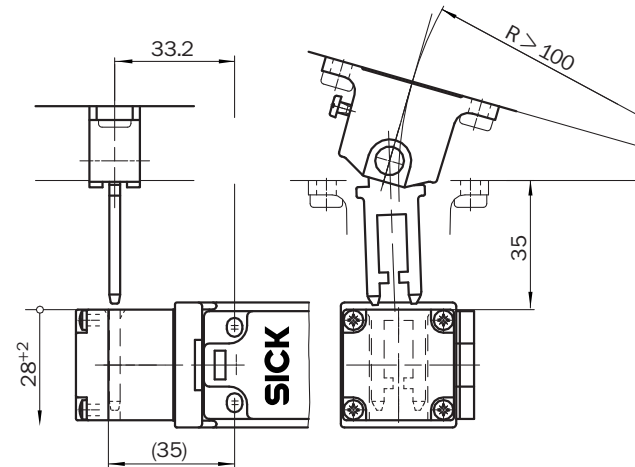
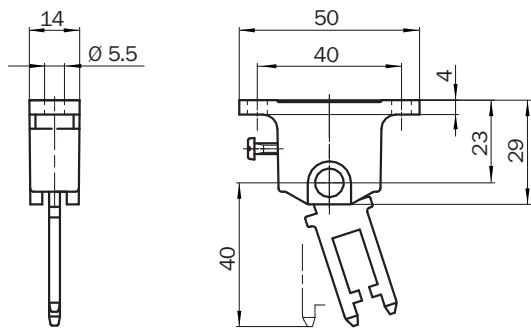
iE10-A4



iE10-R1




iE10-R2



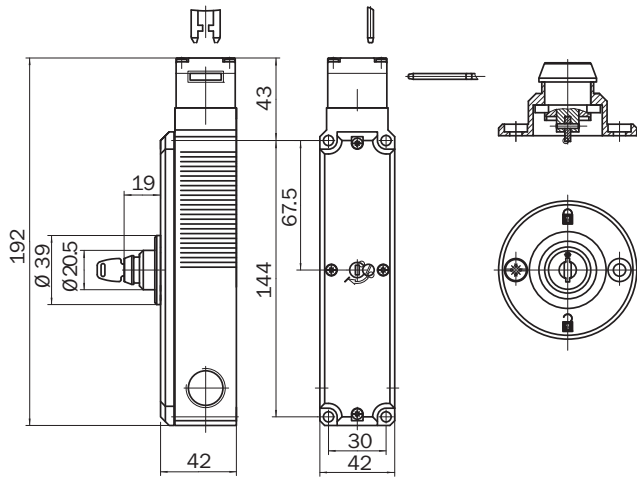
Dimensions in mm



## Lock

Figure	Property	Items supplied	Usage	Type	Part no.
	Parallel closing	Including key	Lock for mechanical unlocking mechanism	iE10-K2	5308270

### iE10-K2




Dimensions in mm

The mechanical unlocking mechanism of the i10 Lock can easily be operated via a key. The lock on the front of the i10 Lock is fixed with two screws.

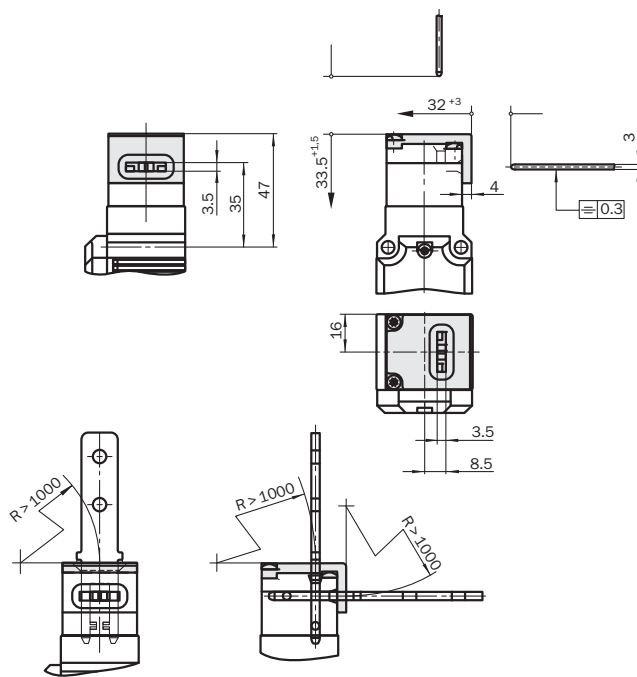
- Parallel closing locking mechanism
- Fixing screws and two keys supplied with delivery.

## Alignment guide

Figure	Type	Part no.
	iE10-G1	5318460

## K

### iE10-G1



Dimensions in mm

The metal alignment guide provides the actuator with a wider entry area into the safety switch. With the alignment guide, the safety switch is better protected against damage.

It can be secured to the safety switch with the two M3 x 34 self-tapping screws (screws supplied with delivery).


It can only be used in combination with actuators with overtravel (iE10-A4, iE10-S4).

It can not be used with special locking devices (i10-E0313S02), which already have a longer top entry overtravel.

## Accessories

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### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



- Glass-fiber reinforced thermoplastic housing
- Integrated AS-Interface
- AS-Interface LED status display
- AS-Interface M12 connection
- Enclosure rating IP 67



K

Further information	Page
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→ Lock	K-47
→ Alignment guide	K-47
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→ Systematic safety	A-0
→ Services	B-0

## Technical data overview

Fieldbus	AS-Interface Safety at Work
Number of positive action N/C solenoid monitoring contacts	1
Number of N/O solenoid monitoring contacts	0
Number of positive action N/C door monitoring contacts	1
Number of N/O door monitoring contacts	0
Number of N/C door monitoring contacts	0
Housing material	Plastic
Maximum locking force	1300 N
Locking type (depending on type)	Electrical / mechanical

## Product description

- Safety switch with remote multi-coded actuator and tumbler mechanism
- 2 positive action normally closed contacts via M12 AS-Interface connection (1 positive action normally closed contact as door contact and 1 positive action normally closed contact as solenoid monitoring)
- Solenoid voltage via external 24 V DC voltage supply
- Small design – ideal for direct mounting on framework
- Various actuator versions available

## Applications



## Ordering information

- Solenoid operating voltage: 24 V DC

Locking type	Solenoid monitoring contacts		Door monitoring contacts			Type	Part no.
	Number of positive action N/C	Number of N/O	Number of positive action N/C	Number of N/O	Number of N/C		
Electrical	1	0	1	0	0	i10-E0455 Lock	6034060
Mechanical						i10-M0455 Lock	6034059

Please order actuator separately



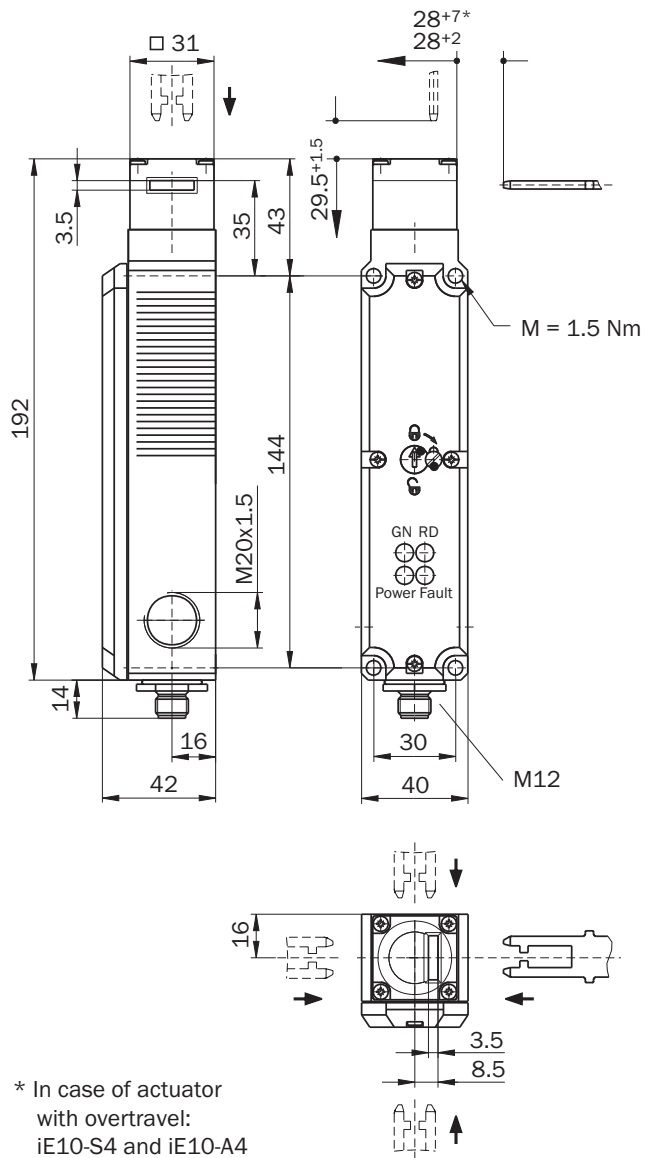
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i10-E0455 Lock	i10-M0455 Lock
Housing material	Glass-fiber reinforced thermoplastic	
Enclosure rating	IP 67	
Safety related parameters		
<b>B<sub>10d</sub> parameter</b>	3 x 10 <sup>6</sup> switching cycles, with small load	
Mechanical life	1 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	-20 °C ... +55 °C	
Maximum approach speed	20 m/min	
Maximum locking force	1300 N	
Switching principle	Slow action switching element	
Number of positive action N/C solenoid monitoring contacts	1	
Number of N/O solenoid monitoring contacts	0	
Number of positive action N/C door monitoring contacts	1	
Number of N/O door monitoring contacts	0	
Number of N/C door monitoring contacts	0	
Solenoid operating voltage	24 V (20.4 V ... 26.4 V) DC <sup>1)</sup>	
Solenoid operating current	Max. 300 mA	
Power consumption	Max. 8 W	
Duty cycle	100 %	
Connection type	Connector	
Number of cable glands x size of the screwed joint	1 x M12, 4-pin	
Fieldbus	AS-Interface Safety at Work	
AS-Interface master version	2.1	
AS-Interface addresses	1 ... 31	
AS-interface voltage range	22.5 V DC ... 31.6 V DC	
AS-interface power consumption	Max. 45 mA	
Data bits IN		
Door monitoring contact DM	AS-Interface Safety at Work code sequence on D0, D1	
Solenoid monitoring contact SM	AS-Interface Safety at Work code sequence on D2, D3	
Data bits OUT		
Interlocking solenoid, 1 = solenoid energized	D0	
LED red, 1 = LED on	D1	
LED green, 1 = LED on	D2	
Not used	D3	
AS-Interface LED Power	Green, AS-Interface power on	
AS-Interface LED Fault	Red, offline phase or address 0	
Weight	0.47 kg	

<sup>1)</sup> Auxiliary voltage on black AS-interface cable








## Dimensional drawings



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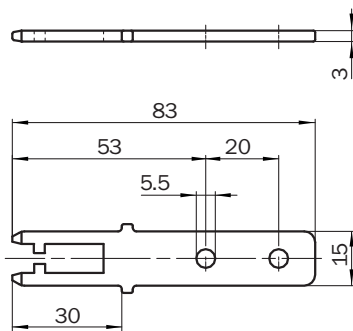
Dimensions in mm

## Actuators <sup>1)</sup>

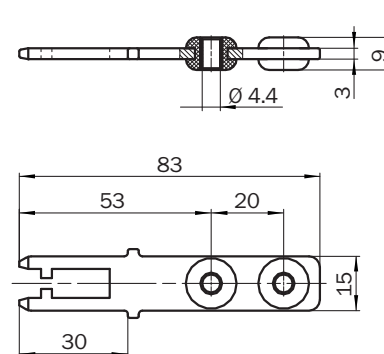
Figure	Design	Actuation option	Method of actuation	Min. door radius	Type	Part no.
	Straight	Rigid	-	1000 mm	iE10-S1	5306527
		Rubber-mounted	-	1000 mm	iE10-S2	5306530
		Rigid	With overtravel	1000 mm	iE10-S4	5308383
	Angled	Rigid	-	1000 mm	iE10-A1	5306535
			With overtravel	1000 mm	iE10-A4	5308497
	Radial	Semiflexible	Door hinged at top/ bottom	90 mm	iE10-R1	5306528
			Door hinged on left/right	100 mm	iE10-R2	5306529

<sup>1)</sup> Including 2 safety screws

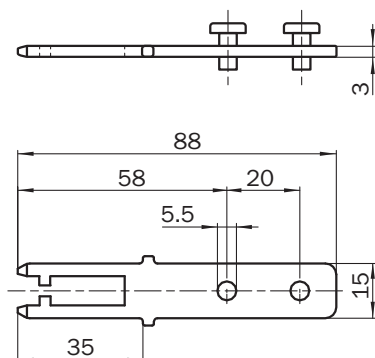
### iE10-S1



### iE10-S2

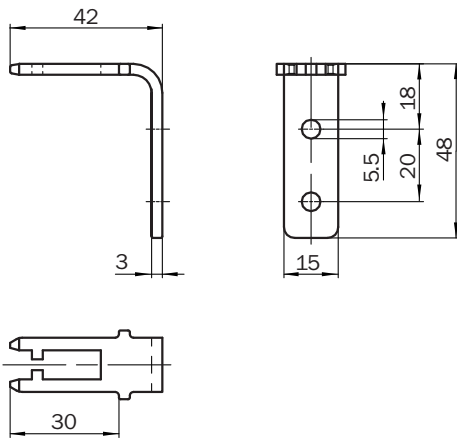


### iE10-S4

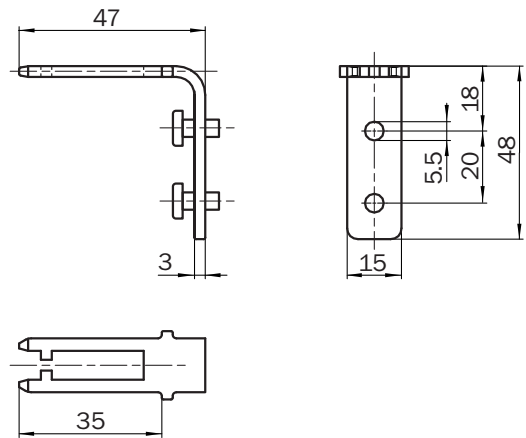


Dimensions in mm

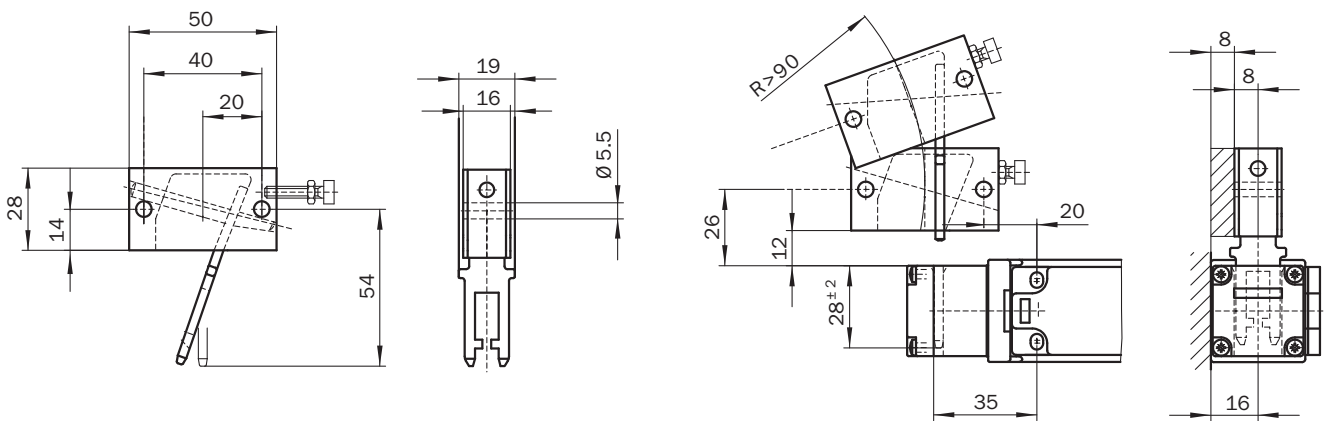
iE10-A1



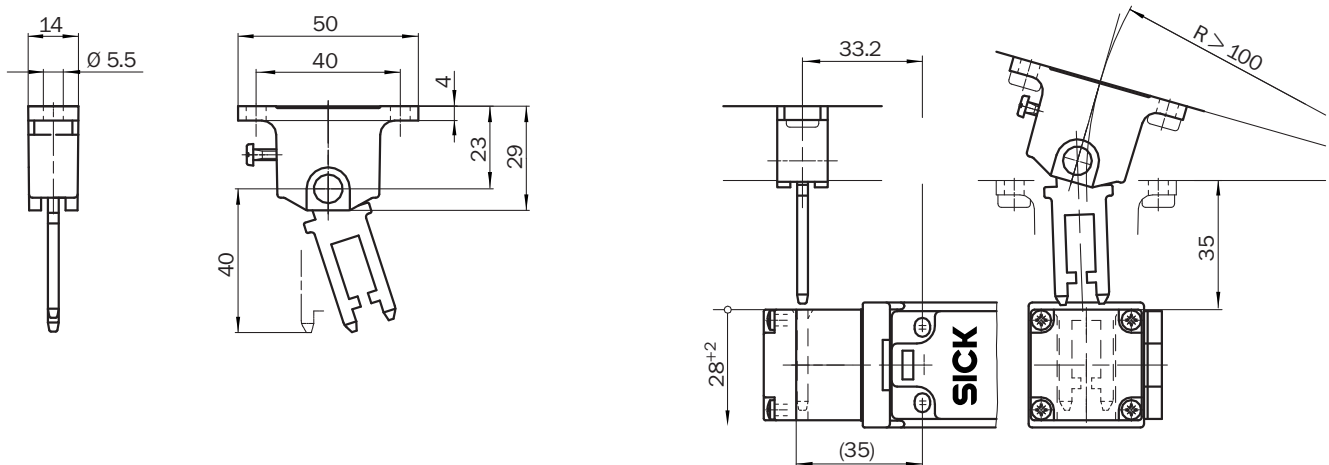
iE10-A4



iE10-R1



iE10-R2



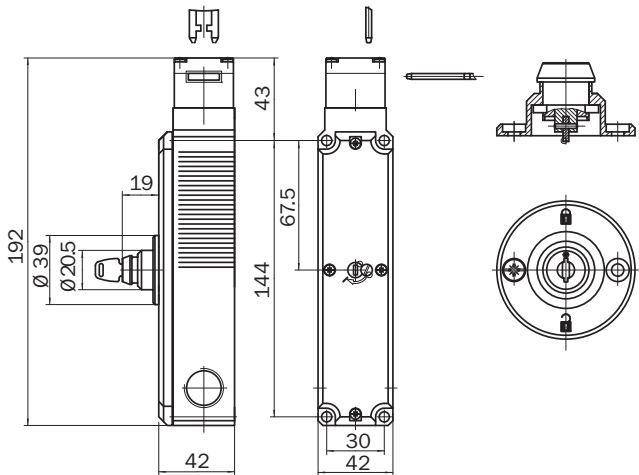
Dimensions in mm



## Lock

Figure	Property	Items supplied	Usage	Type	Part no.
	Parallel closing	Including key	Lock for mechanical unlocking mechanism	iE10-K2	5308270

### iE10-K2



Dimensions in mm

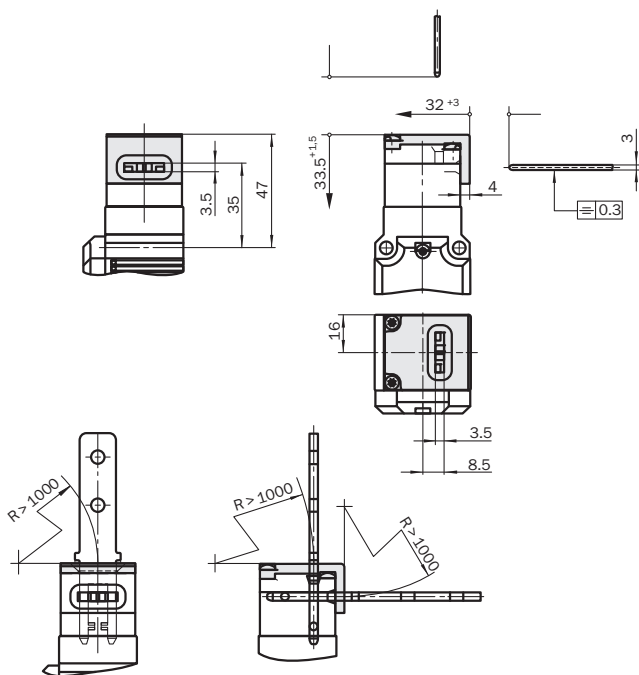
The mechanical unlocking mechanism of the i10 Lock can easily be operated via a key. The lock on the front of the i10 Lock is fixed with two screws.

- Parallel closing locking mechanism
- Fixing screws and two keys supplied with delivery.

## Alignment guide

Figure	Type	Part no.
	iE10-G1	5318460

### iE10-G1



Dimensions in mm

The metal alignment guide provides the actuator with a wider entry area into the safety switch. With the alignment guide, the safety switch is better protected against damage.


It can be secured to the safety switch with the two M3 x 34 self-tapping screws (screws supplied with delivery).

It can only be used in combination with actuators with overtravel (iE10-A4, iE10-S4).

It can not be used with special locking devices (i10-E0313S02), which already have a longer top entry overtravel.

## Accessories

### Connecting cable

Figure	Direction of cable outlet	Connection type	Cable length	Part no.
	Straight	Plug M12 x 5	2 m	6026133
			5 m	6026134

### AS-Interface accessories

Type	Part no.
AS-i FKVT-M12	6030228

K

## Technical data overview

Number of positive action N/C solenoid monitoring contacts (depending on type)	2 / 3
Number of N/O solenoid monitoring contacts (depending on type)	0 / 1
Number of positive action N/C door monitoring contacts	0
Number of N/O door monitoring contacts	0
Number of N/C door monitoring contacts	0
Housing material	Plastic
Maximum locking force	1200 N
Locking type	Mechanical

## Product description

- Safety switches with remote multi-coded actuator and tumbler mechanism
- 3 contacts
- Easy conversion of actuating direction through rotatable head

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

- Solenoid operating voltage: 24 V DC

Locking type	Solenoid monitoring contacts		Door monitoring contacts			Type	Part no.
	Number of positive action N/C	Number of N/O	Number of positive action N/C	Number of N/O	Number of N/C		
Mechanical	2	1	0	0	0	i14-M0213 Lock	6025060
	3	0	0	0	0	i14-M0303 Lock	6025062

Please order actuator separately



- Glass-fiber reinforced thermoplastic housing
- Three actuating directions
- LED solenoid display
- Mechanical unlocking mechanisms on three sides



# K

Further information	Page
→ Technical specifications	K-50
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→ Actuator travel diagram	K-52
→ Actuators	K-52
→ Accessories	K-53
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

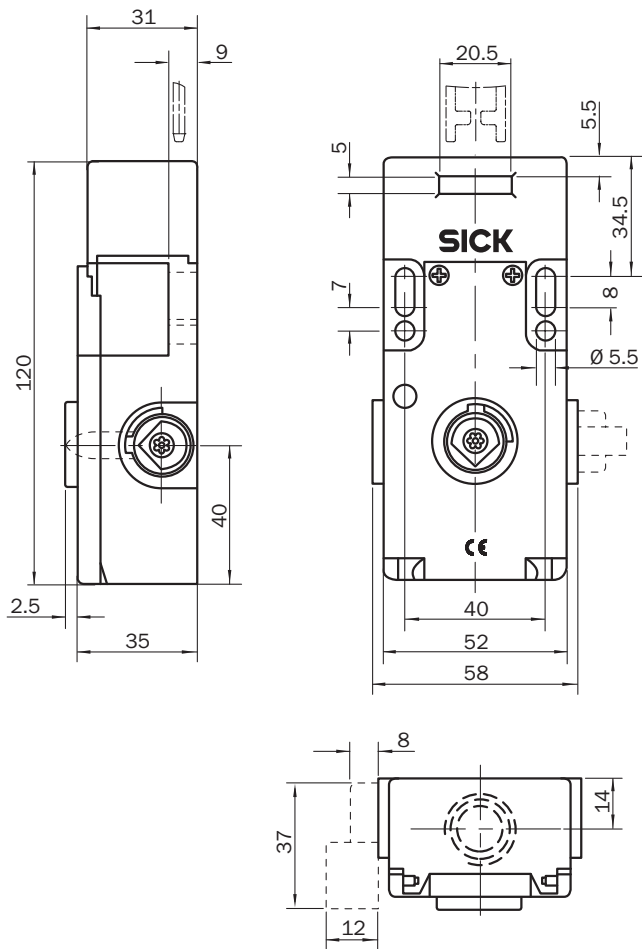
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i14-M0213 Lock	i14-M0303 Lock
Housing material	Glass-fiber reinforced thermoplastic	
Enclosure rating	IP 65	
Safety related parameters		
B <sub>10d</sub> parameter	2 x 10 <sup>6</sup> switching cycles, with small load	
Mechanical life	1 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	-20 °C ... +60 °C	
Maximum approach speed	10 m/min	
Actuation force	12 N	
Maximum locking force	1200 N	
Actuation frequency	Max. 3600/h	
Switching principle	Slow action switching element	
Number of positive action N/C solenoid monitoring contacts	2	3
Number of N/O solenoid monitoring contacts	1	0
Number of positive action N/C door monitoring contacts	0	
Number of N/O door monitoring contacts	0	
Number of N/C door monitoring contacts	0	
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13	
Rated operating current (voltage)	3 A (240 V AC), 2 A (24 V DC)	
Rated insulation voltage U <sub>i</sub>	250 V	
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC	
Minimum switching voltage	5 V DC	
Minimum switching current (switching voltage)	5 mA (5 V DC)	
Solenoid operating voltage	24 V (20.4 V ... 26.4 V) DC	
Power consumption	Max. 7 W	
Duty cycle	100 %	
Connection type	Cable gland	
Number of cable glands x size of the screwed joint	1 x M20	
Maximum connection cable cross-section	1.5 mm <sup>2</sup>	
Short-circuit protection	3 A gG	
Weight	0.37 kg	

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## Dimensional drawings



Dimensions in mm



## Switching elements

	Actuator inserted		Actuator removed
	locked	unlocked	
<b>Switching element 21</b>			
<b>Switching element 30</b>			

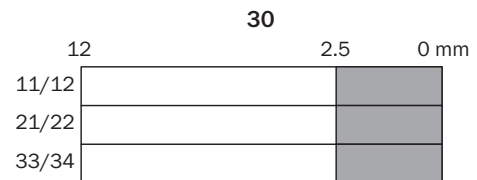
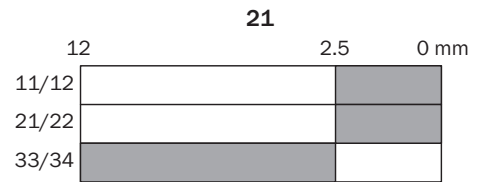
### Switching element 21:

2 positive action N/C contacts + 1 N/O contact

### Switching element 30:

3 positive action N/C contacts

## Actuator travel diagram



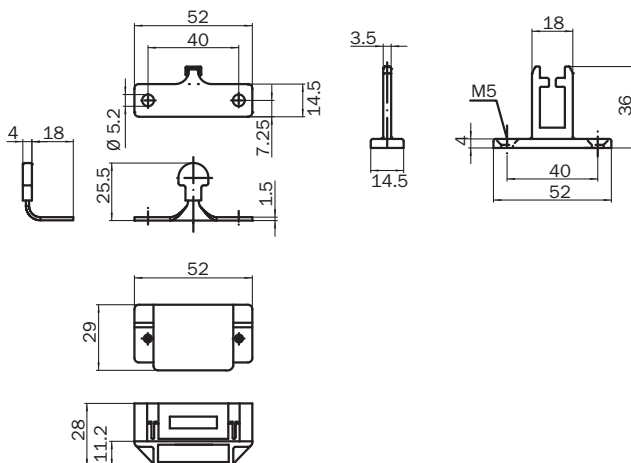
- Contacts open
- Contacts closed

Contact action over the entire actuator withdrawal distance  
(full insertion = 0 mm)

## Actuators

Figure	Design	Actuation option	Method of actuation	Min. door radius	Type	Part no.
	Straight	Rigid	Catch and retainer set for increased retaining force	160 mm	iE14-S1	5311133

### iE14-S1




Dimensions in mm


## Accessories

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### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164

### Key

Figure	Mechanical unlocking mechanism	Type	Part no.
	✓	iE14-E01	5311282



- Short, compact design
- Glass-fiber reinforced thermoplastic housing
- Four actuating directions
- Enclosure rating IP 67
- Optional actuating head made of metal or plastic



K

Further information	Page
→ Dimensional drawings	K-56
→ Switching elements	K-57
→ Actuators	K-58
→ Accessories	K-59
→ Systematic safety	A-0
→ Services	B-0

## Technical data overview

Number of positive action N/C solenoid monitoring contacts	1
Number of N/O solenoid monitoring contacts	0
Number of positive action N/C door monitoring contacts (depending on type)	1 / 2
Number of N/O door monitoring contacts (depending on type)	0 / 1
Number of N/C door monitoring contacts	0
Housing material	Plastic
Maximum locking force (depending on type)	1000 N / 2000 N <sup>1)</sup>
Locking type (depending on type)	Electrical / mechanical

<sup>1)</sup> 1500 N with angled actuator

## Product description

- Safety locking device with remote multi-coded actuator
- 2 contacts for remote locking and door monitoring functions
- Easy conversion of actuating direction through rotatable head
- Various actuator versions available

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

- Solenoid operating voltage: 24 V DC

Locking type	Actuating head	Solenoid monitoring contacts		Door monitoring contacts			Type	Part no.
		Number of positive action N/C	Number of N/O	Number of positive action N/C	Number of N/O	Number of N/C		
Electrical	Metal	1	0	2	0	0	i15-EM0123 Lock	6034028
				1	1	0	i15-EM0133 Lock	6034029
	Plastic	1	0	2	0	0	i15-EP0123 Lock	6034030
				1	1	0	i15-EP0133 Lock	6034031
Mechanical	Metal	1	0	2	0	0	i15-MM0123 Lock	6034024
				1	1	0	i15-MM0133 Lock	6034025
	Plastic	1	0	2	0	0	i15-MP0123 Lock	6034026
				1	1	0	i15-MP0133 Lock	6034027

Please order actuator separately

## Technical specifications

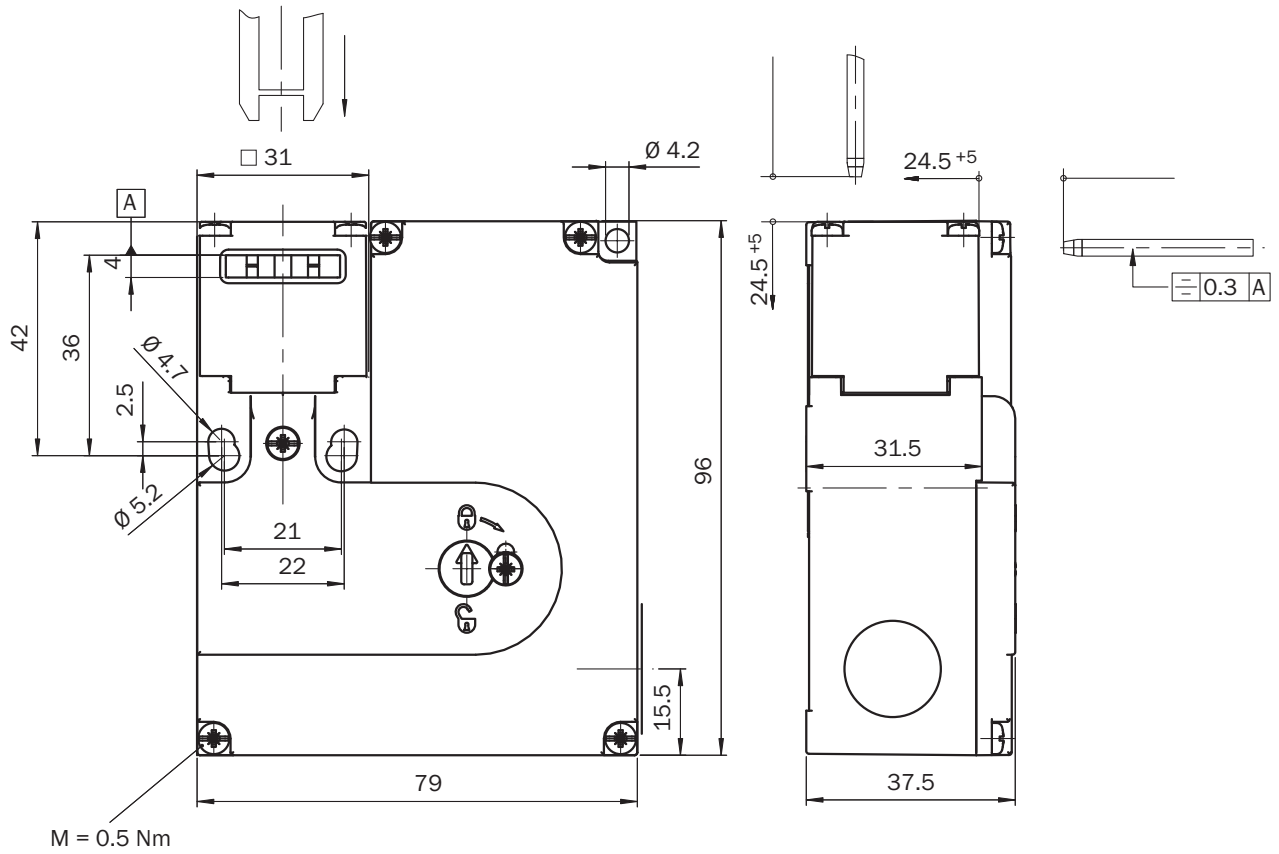
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i15-EM0123 Lock	i15-EM0133 Lock	i15-EP0123 Lock	i15-EP0133 Lock	i15-MM0123 Lock	i15-MM0133 Lock	i15-MP0123 Lock	i15-MP0133 Lock
Housing material	Glass-fiber reinforced thermoplastic							
Actuating head	Metal		Plastic		Metal		Plastic	
Enclosure rating	IP 67							
Safety related parameters								
$B_{10d}$ parameter	2 x 10 <sup>6</sup> switching cycles, with small load							
Mechanical life	2 x 10 <sup>6</sup> switching cycles							
Ambient operating temperature from ... to	-20 °C ... +55 °C							
Maximum approach speed	20 m/min							
Actuation force	35 N							
Maximum locking force	2000 N <sup>1)</sup>		1000 N		2000 N <sup>1)</sup>		1000 N	
Actuation frequency	Max. 7000/h							
Switching principle	Slow action switching element							
Number of positive action N/C solenoid monitoring contacts	1							
Number of N/O solenoid monitoring contacts	0							
Number of positive action N/C door monitoring contacts	2	1	2	1	2	1	2	1
Number of N/O door monitoring contacts	0	1	0	1	0	1	0	1
Number of N/C door monitoring contacts	0							
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13							
Rated operating current (voltage)	4 A (230 V AC), 4 A (24 V DC)							
Rated insulation voltage U <sub>i</sub>	250 V							
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC							
Minimum switching voltage	12 V DC							
Minimum switching current (switching voltage)	1 mA (24 V DC)							
Solenoid operating voltage	24 V (20.4 V ... 26.4 V) DC							
Power consumption	Max. 6 W							
Duty cycle	100 %							
Connection type	Cable gland							
Number of cable glands x size of the screwed joint	1 x M20							
Maximum connection cable cross-section	1.5 mm <sup>2</sup>							
Short-circuit protection	4 A gG							
Weight	0.48 kg		0.45 kg		0.48 kg		0.45 kg	

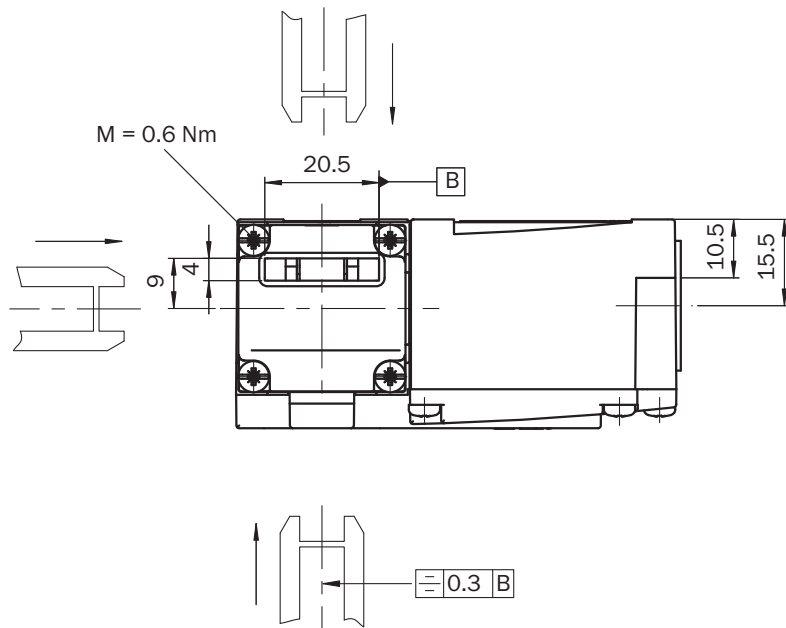
<sup>1)</sup> 1500 N with angled actuator



Dimensional drawings



K



Dimensions in mm

## Switching elements

	Actuator inserted		Actuator removed
	locked	unlocked	
<b>Switching element 12</b>	<p>DM SM</p> <p>⊕ 21   ⊖ 22   ⊕ 11   ⊖ 12</p> <p>⊖ 11   ⊕ 12</p>	<p>DM SM</p> <p>⊕ 21   ⊖ 22   ⊖ 11   ⊕ 12</p> <p>⊖ 11   ⊕ 12</p>	<p>DM SM</p> <p>⊕ 21   ⊖ 22   ⊖ 11   ⊕ 12</p> <p>⊖ 11   ⊕ 12</p>
<b>Switching element 13</b>	<p>DM SM</p> <p>⊕ 23   ⊖ 24   ⊖ 11   ⊕ 12</p> <p>⊖ 11   ⊕ 12</p>	<p>DM SM</p> <p>⊕ 23   ⊖ 24   ⊖ 11   ⊕ 12</p> <p>⊖ 11   ⊕ 12</p>	<p>DM SM</p> <p>⊕ 23   ⊖ 24   ⊖ 11   ⊕ 12</p> <p>⊖ 11   ⊕ 12</p>

**SM: Solenoid monitoring contacts**

**DM: Door monitoring contacts**





**Switching element 12:**

1 positive action N/C + 2 positive action N/C as door contacts

**Switching element 13:**

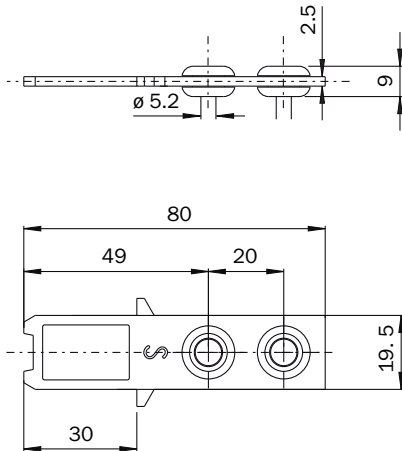
1 positive action N/C + 1 positive action N/C as door contact  
+ 1 N/O as door contact

## Actuators <sup>1)</sup>

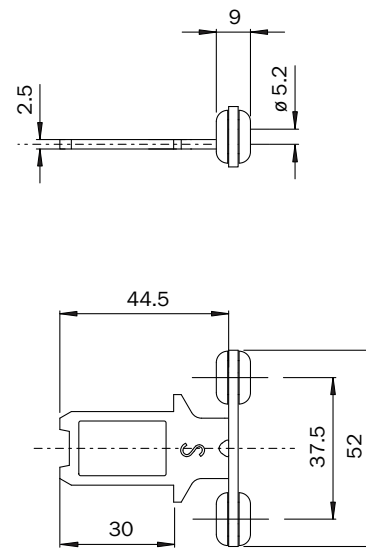
Figure	Design	Actuation option	Method of actuation	Min. door radius	Type	Part no.
	Straight	Rubber-mounted	-	300 mm	iE15-S1	5319975
	Angled	Rubber-mounted	-	300 mm	iE15-A1	5319976
	Radial	Semiflexible	Door hinged at top/ bottom	200 mm	iE15-R1	5319977
			Door hinged on left/right	100 mm	iE15-R2	5319978

<sup>1)</sup> Including 2 safety screws

### iE15-S1



### iE15-A1

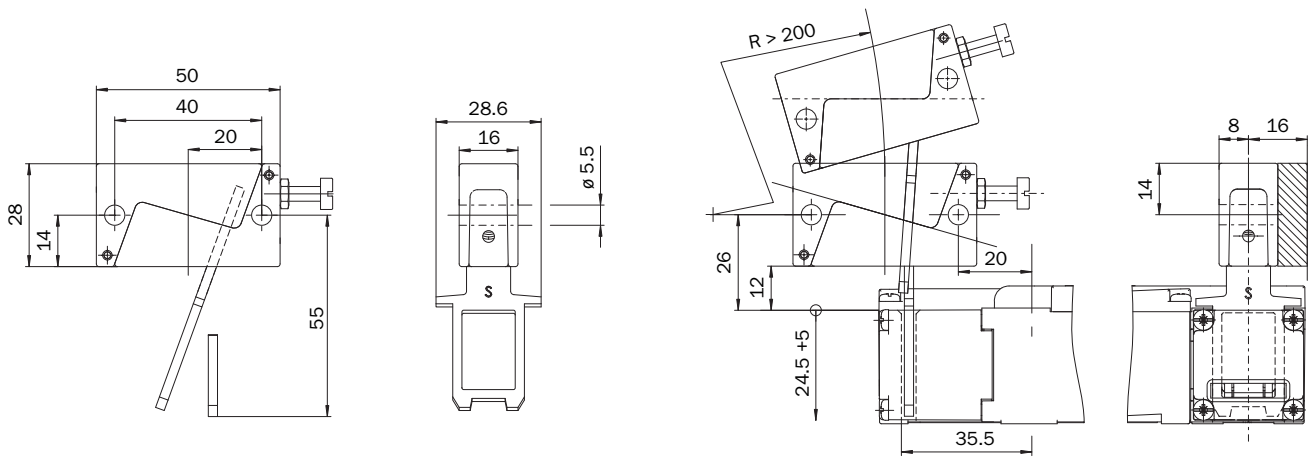


Dimensions in mm

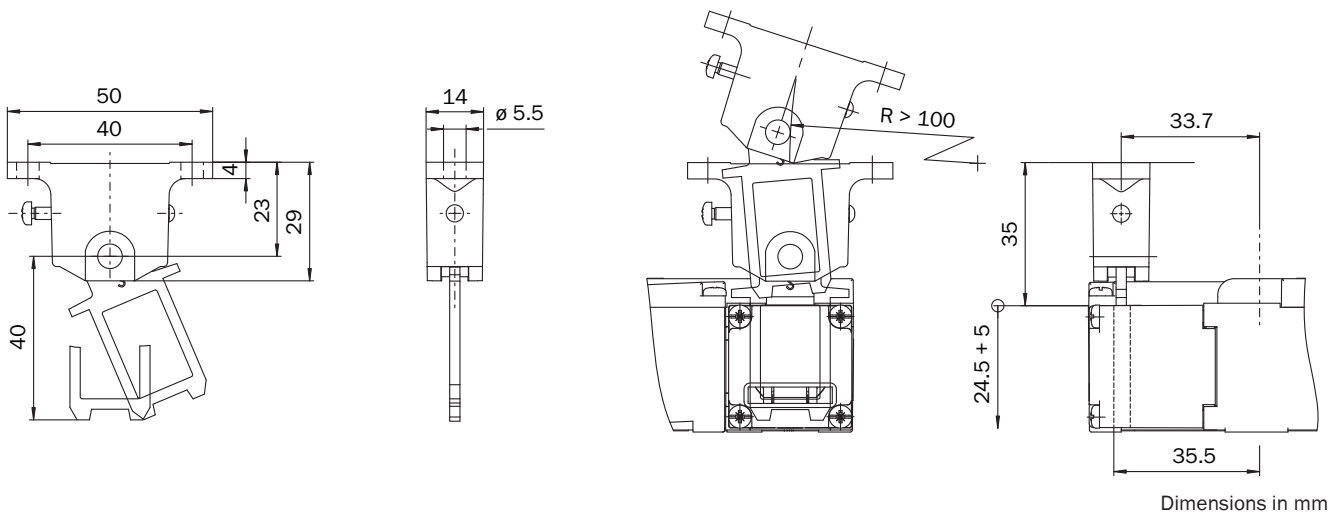
K



iE15-R1




iE15-R2



Accessories

Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



- Glass-fiber reinforced thermoplastic housing
- Entry for actuator made of stainless steel
- Three actuating directions
- Cable gland 3 x M20
- LED solenoid display



K

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## Technical data overview

Number of positive action N/C solenoid monitoring contacts (depending on type)	1 / 2
Number of N/O solenoid monitoring contacts (depending on type)	0 / 1
Number of positive action N/C door monitoring contacts	2
Number of N/O door monitoring contacts	1
Number of N/C door monitoring contacts	0
Housing material	Plastic
Maximum locking force	2000 N <sup>1)</sup>
Locking type (depending on type)	Electrical / mechanical

<sup>1)</sup> Only in combination with the delivered fixing screws, otherwise 1500 N

## Product description

- Safety switches with remote multi-coded actuator and tumbler mechanism
- 2 contacts for remote locking and door monitoring functions
- Straight, flexible or bolt actuator available

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

- Solenoid operating voltage: 24 V DC

Locking type	Solenoid monitoring contacts		Door monitoring contacts			Type	Part no.
	Number of positive action N/C	Number of N/O	Number of positive action N/C	Number of N/O	Number of N/C		
Mechanical	1	1	2	1	0	I200-M0323 Lock	6025113
	2	0	2	1	0	I200-M0413 Lock	6025115
Electrical	1	1	2	1	0	I200-E0323 Lock	6026140

Please order actuator separately

## Technical specifications

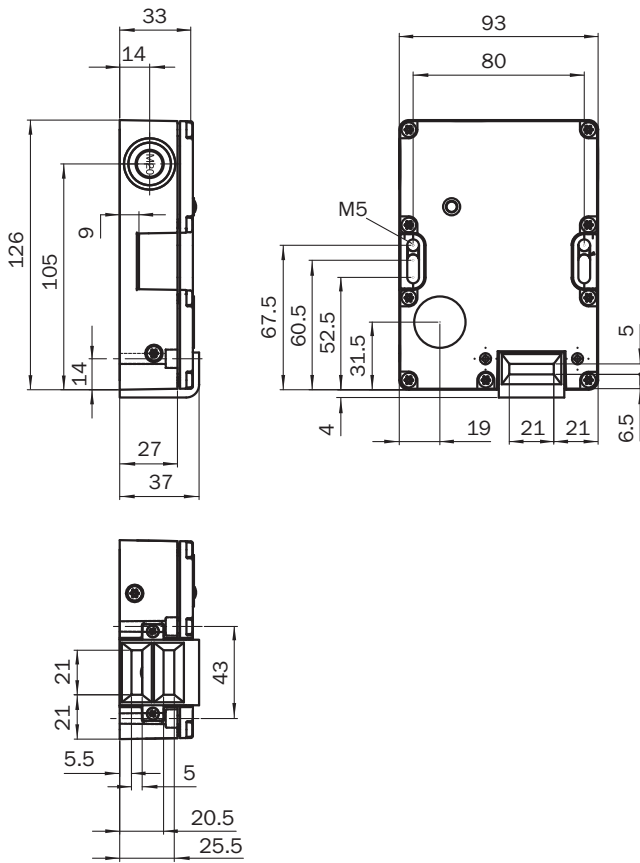
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	I200-M0323 Lock	I200-M0413 Lock	I200-E0323 Lock
Housing material	Glass-fiber reinforced polyester		
Enclosure rating	IP 65		
Safety related parameters			
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load		
Mechanical life	1 x 10 <sup>6</sup> switching cycles		
Ambient operating temperature from ... to	-20 °C ... +60 °C		
Maximum approach speed	10 m/min		
Maximum locking force	2000 N <sup>1)</sup>		
Actuation frequency	Max. 3600/h		
Switching principle	Slow action switching element		
Number of positive action N/C solenoid monitoring contacts	1	2	1
Number of N/O solenoid monitoring contacts	1	0	1
Number of positive action N/C door monitoring contacts	2		
Number of N/O door monitoring contacts	1		
Number of N/C door monitoring contacts	0		
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13		
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)		
Rated insulation voltage U <sub>i</sub>	500 V		
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC		
Minimum switching voltage	5 V DC		
Minimum switching current (switching voltage)	5 mA (5 V DC)		
Solenoid operating voltage	24 V (20.4 V ... 26.4 V) DC		
Power consumption	Max. 7 W		
Duty cycle	100 %		
Connection type	Cable gland		
Number of cable glands x size of the screwed joint	3 x M20		
Short-circuit protection	3 A gG		
Weight	0.55 kg		

<sup>1)</sup> Only in combination with the delivered fixing screws, otherwise 1500 N



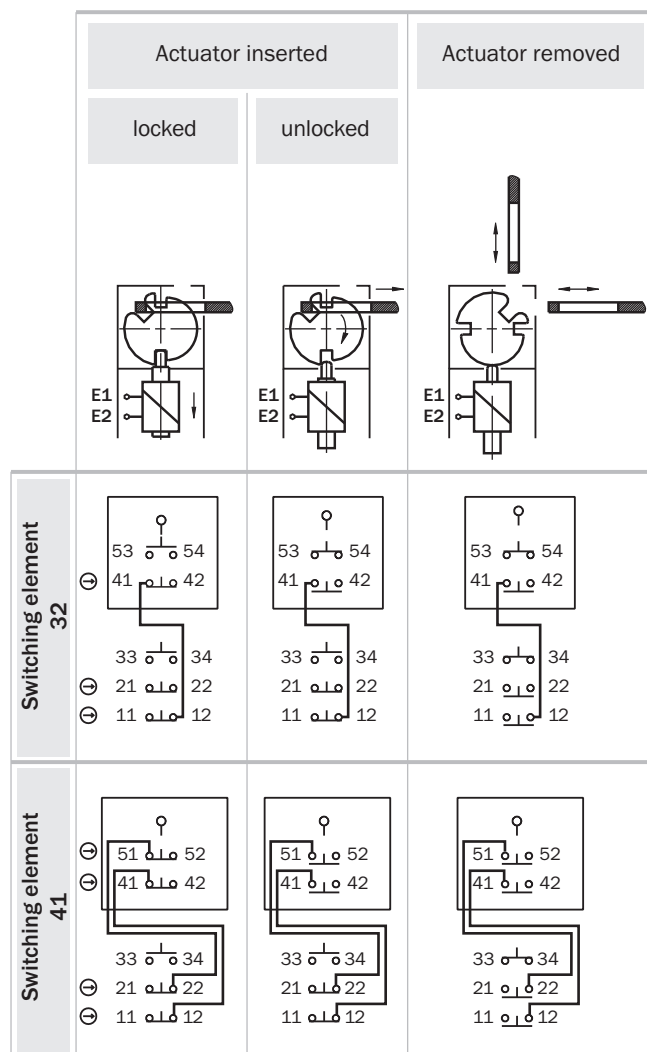
## Dimensional drawings



Dimensions in mm



## Switching elements



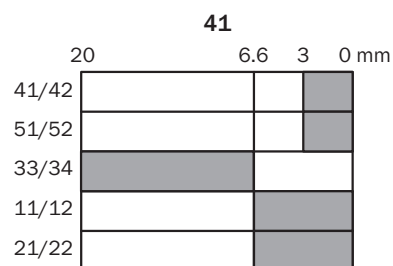
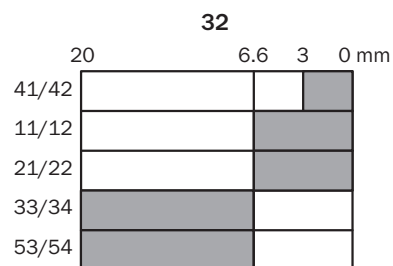
### Switching element 32:

1 positive action N/C contact + 1 N/O contact + 2 positive action N/C as door contacts + 1 N/O as door contact

### Switching element 41:

2 positive action N/C contacts + 2 positive action N/C as door contacts + 1 N/O as door contact

## Actuator travel diagram



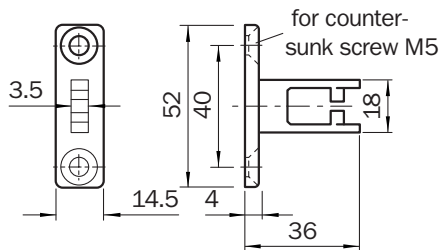
- Contacts open
- Contacts closed

Contact action over the entire actuator withdrawal distance (full insertion = 0 mm)

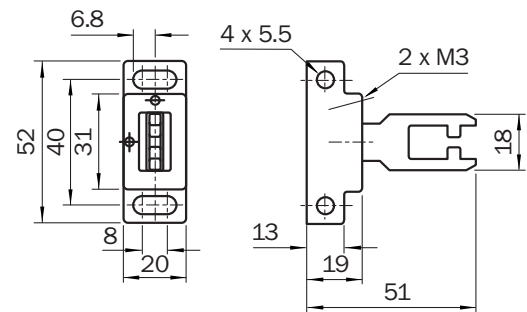
## Actuators

Figure	Design	Actuation option	Min. door radius	Type	Part no.
	Straight	Rigid	175 mm	iE200-S1	5308758
	Radial	Fully flexible	80 mm	iE200-F1	5308759
	Bolt actuator straight	Rigid	175 mm	iE200-B1	5308760

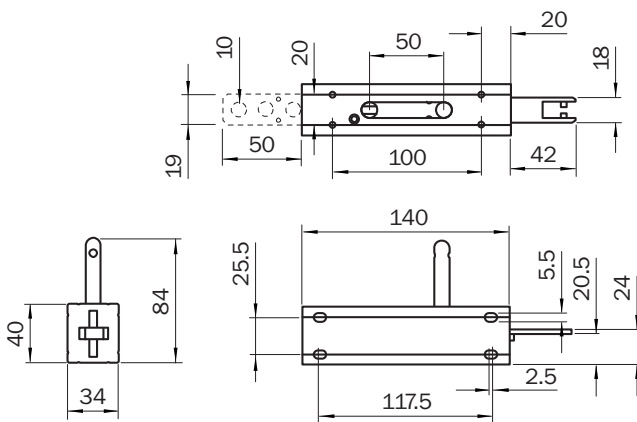
### iE200-S1



### iE200-F1



### iE200-B1




Dimensions in mm

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## Accessories

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### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



- Glass-fiber reinforced thermoplastic housing
- Cable gland M20
- Design according to EN 50047
- Enclosure rating IP 66



## Technical data overview

Number of positive action N/C contacts	2
Number of N/O contacts	1
Switching principle	Slow action switching element
Type of actuator	Roller plunger
Housing material	Plastic
Enclosure rating	IP 66

## Product description

- Roller plunger design
- Plunger made of plastic
- 3 contacts

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

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## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	1	i10-PA213	6025088

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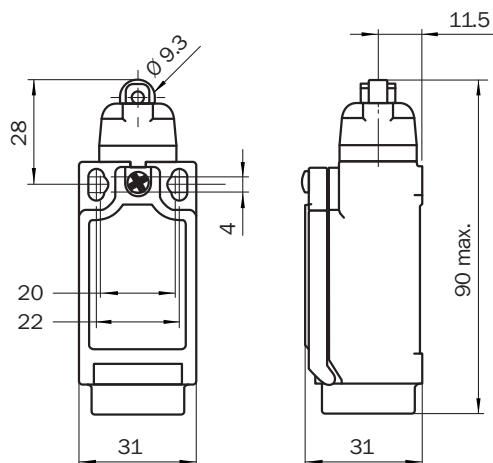


## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

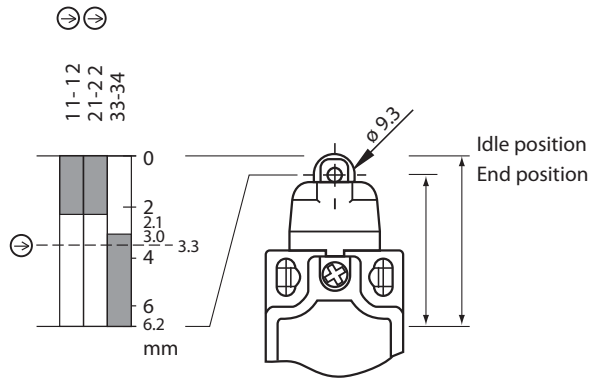
Housing material	Glass-fiber reinforced thermoplastic
Enclosure rating	IP 66
Safety related parameters	
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load
Mechanical life	10 x 10 <sup>6</sup> switching cycles
Ambient operating temperature from ... to	-25 °C ... +80 °C
Approach speed from ... to	0.1 m/min ... 15 m/min
Actuation force	6 N
Actuation frequency	Max. 6000/h
Switching principle	Slow action switching element
Number of positive action N/C contacts	2
Number of N/O contacts	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)
Rated insulation voltage U <sub>i</sub>	250 V
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC
Minimum switching voltage	5 V DC
Minimum switching current (switching voltage)	5 mA (5 V DC)
Connection type	Cable gland
Number of cable glands x size of the screwed joint	1 x M20
Maximum connection cable cross-section	2.5 mm <sup>2</sup>
Short-circuit protection	F15
Positive break travel	3.3 mm
Weight	0.11 kg

## Dimensional drawings



Dimensions in mm


## Actuator travel diagram



- Contacts open
- Contacts closed

## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164

## Technical data overview

Number of positive action N/C contacts	2
Number of N/O contacts	1
Switching principle	Slow action switching element
Type of actuator	Turning lever
Housing material	Plastic
Enclosure rating	IP 66

## Product description

- Turning lever design
- Roller made of plastic
- 3 contacts

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	1	i10-RA213	6025085



- Glass-fiber reinforced thermoplastic housing
- Cable gland M20
- Design according to EN 50047
- Enclosure rating IP 66



# K

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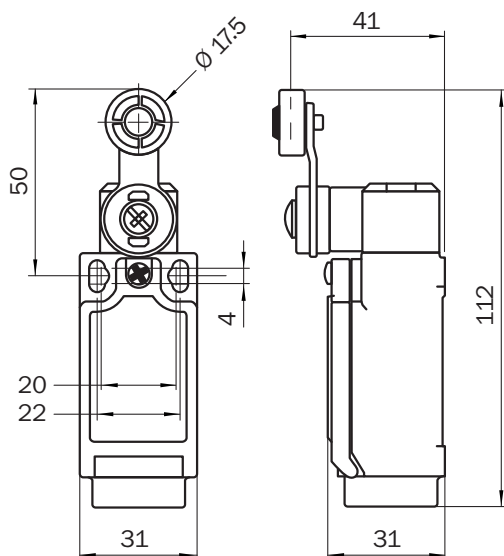
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Housing material	Glass-fiber reinforced thermoplastic
Enclosure rating	IP 66
Safety related parameters	
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load
Mechanical life	10 x 10 <sup>6</sup> switching cycles
Ambient operating temperature from ... to	-25 °C ... +80 °C
Minimum actuation torque	0.14 Nm
Approach speed from ... to	0.1 m/min ... 15 m/min
Actuation frequency	Max. 6000/h
Switching principle	Slow action switching element
Number of positive action N/C contacts	2
Number of N/O contacts	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)
Rated insulation voltage U <sub>i</sub>	250 V
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC
Minimum switching voltage	5 V DC
Minimum switching current (switching voltage)	5 mA (5 V DC)
Connection type	Cable gland
Number of cable glands x size of the screwed joint	1 x M20
Maximum connection cable cross-section	2.5 mm <sup>2</sup>
Short-circuit protection	F15
Positive break angle	47°
Weight	0.11 kg

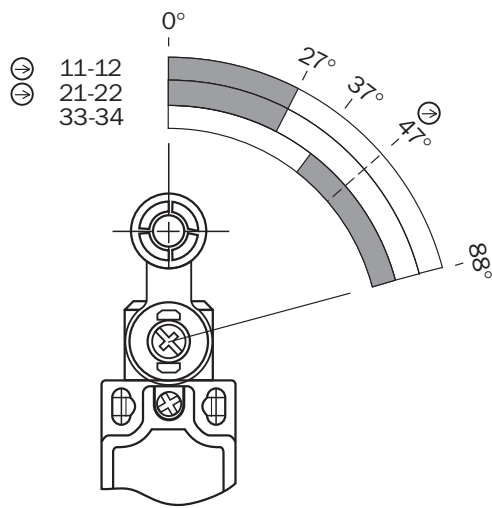
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## Dimensional drawings



Dimensions in mm


## Actuator travel diagram



- Contacts open
- Contacts closed

## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164





- Die-cast zinc housing
- Roller plunger with stainless steel roller
- Slow or snap action switching element
- Cable gland M20
- Design according to EN 50041
- Enclosure rating IP 66



K

## Technical data overview

Number of positive action N/C contacts (depending on type)	1 / 2 / 3
Number of N/O contacts (depending on type)	1 / 2
Switching principle (depending on type)	Slow action switching element / snap action switching element
Type of actuator	Roller plunger
Housing material	Metal
Enclosure rating	IP 66

## Product description

- Roller plunger design
- 2 or 4 contacts

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

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## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
1	1	i110-PA123	6025106
2	2	i110-PA223	6025105
3	1	i110-PA313	6025104

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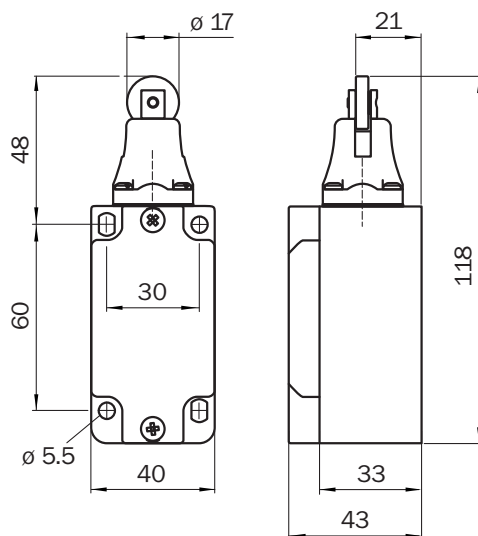
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i110-PA123	i110-PA223	i110-PA313
Housing material	Die-cast zinc		
Surface treatment	Varnished		
Enclosure rating	IP 66		
Safety related parameters			
$B_{10d}$ parameter	2 x 10 <sup>6</sup> switching cycles, with small load		
Mechanical life	10 x 10 <sup>6</sup> switching cycles		
Ambient operating temperature from ... to	-25 °C ... +80 °C		
Approach speed from ... to	0.1 m/min ... 15 m/min		
Actuation force	13 N	11 N	
Actuation frequency	Max. 6000/h		
Switching principle	Snap action switching element	Slow action switching element	
Number of positive action N/C contacts	1	2	3
Number of N/O contacts	1	2	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13		
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)		
Rated insulation voltage $U_i$	250 V		
Rated impulse withstand voltage $U_{imp}$	2500 V AC		
Minimum switching voltage	5 V DC		
Minimum switching current (switching voltage)	5 mA (5 V DC)		
Connection type	Cable gland		
Number of cable glands x size of the screwed joint	1 x M20		
Maximum connection cable cross-section	2.5 mm <sup>2</sup>		
Short-circuit protection	F15		
Positive break travel	4.5 mm	4 mm	
Weight	0.43 kg		

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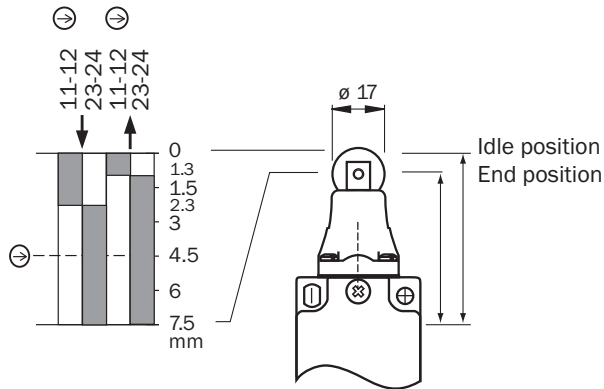
## Dimensional drawings



Dimensions in mm

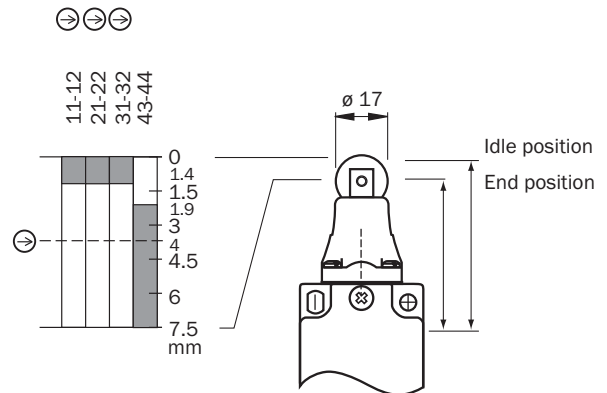
## Actuator travel diagram

### i110-PA123



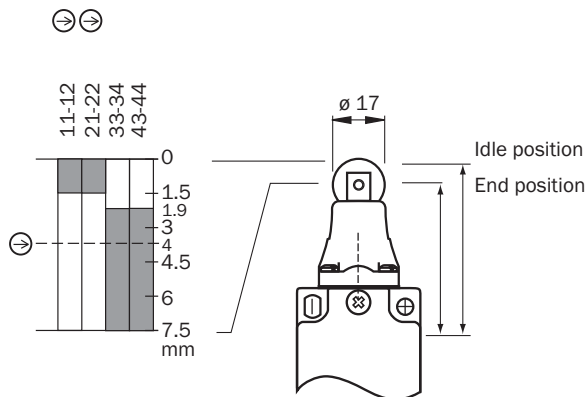
□ Contacts open  
■ Contacts closed

### i110-PA313



□ Contacts open  
■ Contacts closed

### i110-PA223




□ Contacts open  
■ Contacts closed

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## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



## Technical data overview

Number of positive action N/C contacts (depending on type)	1 / 2 / 3
Number of N/O contacts (depending on type)	1 / 2
Switching principle (depending on type)	Slow action switching element / snap action switching element
Type of actuator	Turning lever
Housing material	Metal
Enclosure rating	IP 66

## Product description

- Turning lever design
- 2 or 4 contacts

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

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## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
1	1	i110-RA123	6025109
2	2	i110-RA223	6025108
3	1	i110-RA313	6025107



- Die-cast zinc housing
- Turning lever with plastic roller
- Slow or snap action switching element
- Cable gland M20
- Design according to EN 50041
- Enclosure rating IP 66



K

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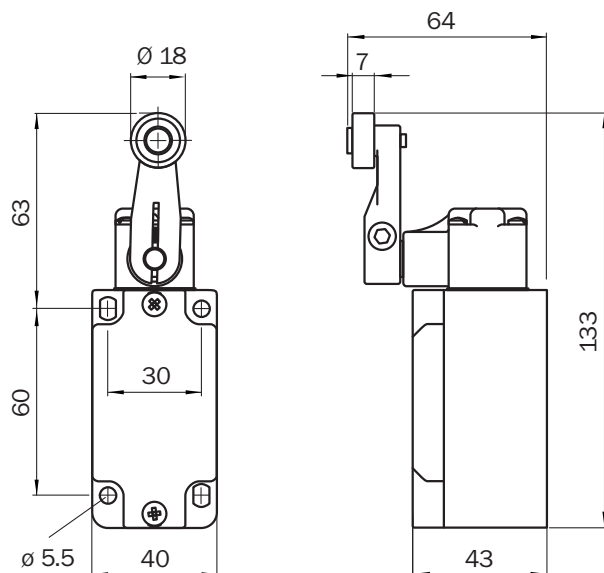
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i110-RA123	i110-RA223	i110-RA313
Housing material	Die-cast zinc		
Surface treatment	Varnished		
Enclosure rating	IP 66		
Safety related parameters			
B <sub>10d</sub> parameter	2 x 10 <sup>6</sup> switching cycles, with small load		
Mechanical life	10 x 10 <sup>6</sup> switching cycles		
Ambient operating temperature from ... to	-25 °C ... +80 °C		
Minimum actuation torque	0.34 Nm		
Approach speed from ... to	0.1 m/min ... 15 m/min		
Actuation frequency	Max. 6000/h		
Switching principle	Snap action switching element	Slow action switching element	
Number of positive action N/C contacts	1	2	3
Number of N/O contacts	1	2	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13		
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)		
Rated insulation voltage U <sub>i</sub>	250 V		
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC		
Minimum switching voltage	5 V DC		
Minimum switching current (switching voltage)	5 mA (5 V DC)		
Connection type	Cable gland		
Number of cable glands x size of the screwed joint	1 x M20		
Maximum connection cable cross-section	2.5 mm <sup>2</sup>		
Short-circuit protection	F15		
Positive break angle	54°	44°	
Weight	0.52 kg		

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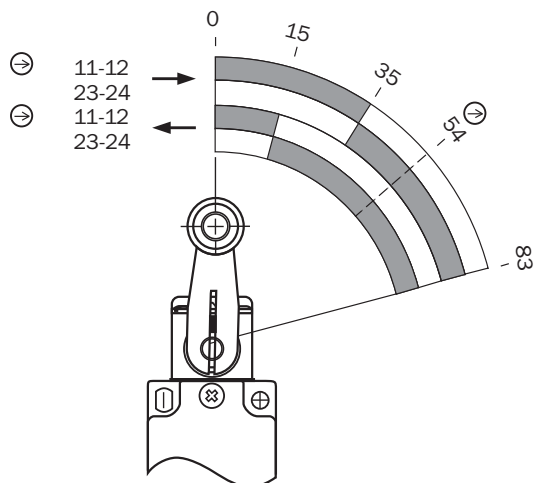
## Dimensional drawings



Dimensions in mm

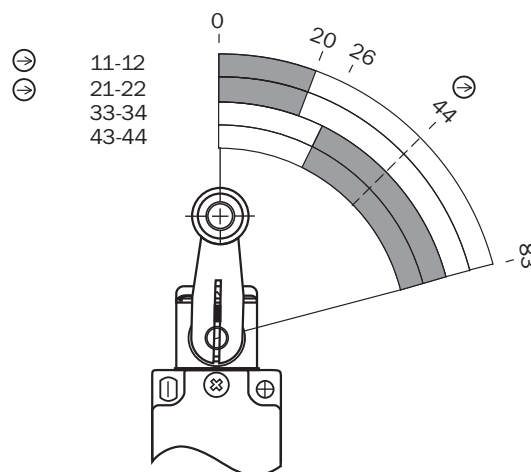
## Actuator travel diagram

**i110-RA123**



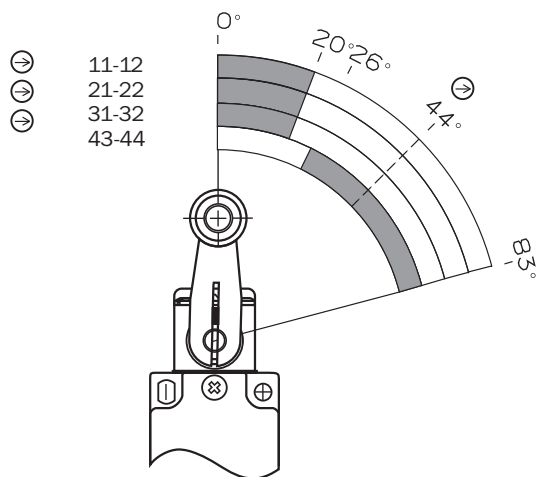
□ Contacts open  
■ Contacts closed

**i110-RA223**



□ Contacts open  
■ Contacts closed

**i110-RA313**




□ Contacts open  
■ Contacts closed

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## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



- Glass-fiber reinforced thermoplastic housing
- Solid stainless steel shaft
- Cable gland M16
- Adjustable switching point
- Miniature housing and design according to EN 50047
- Enclosure rating IP 67



K

## Technical data overview

Number of positive action N/C contacts (depending on type)	1 / 2
Number of N/O contacts	1
Type of shaft	Solid shaft
Length of the shaft (depending on type)	55 mm / 85 mm
Housing material	Plastic
Enclosure rating	IP 67

## Product description

- Safety hinge switches for direct installation of gate and door hinges
- Solid shaft design
- 2 or 3 contacts

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

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## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
1	1	i10-HA113	6025050
2	1	i10-HB213	6025053

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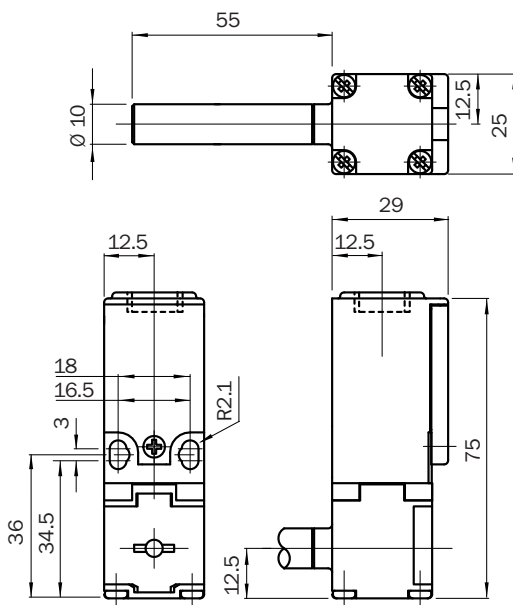
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

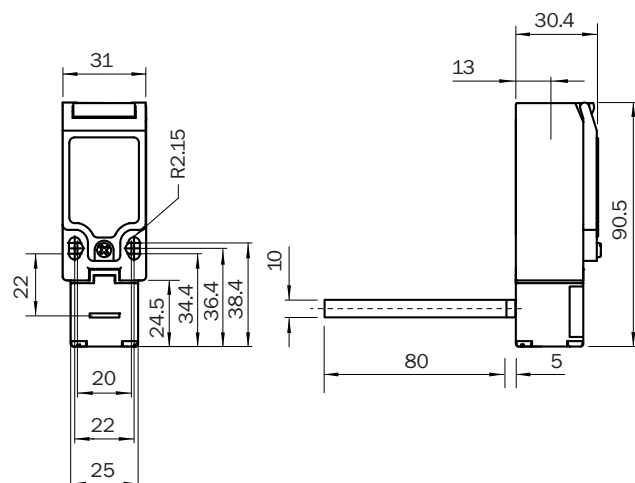
Type	i10-HA113	i10-HB213
Housing material	Glass-fiber reinforced polyester	
Enclosure rating	IP 67	
Safety related parameters		
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load	
Mechanical life	1 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	-20 °C ... +80 °C	
Minimum actuation torque	0.08 Nm	
Actuation frequency	Max. 3600/h	
Switching principle	Slow action switching element	
Switching angle	Adjustable 3° ... 11°	Adjustable 5° ... 14°
Number of positive action N/C contacts	1	2
Number of N/O contacts	1	
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13	
Rated operating current (voltage)	3 A (240 V AC), 2 A (24 V DC)	
Rated insulation voltage U <sub>i</sub>	250 V	
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC	
Minimum switching voltage	5 V DC	
Minimum switching current (switching voltage)	5 mA (5 V DC)	
Connection type	Cable gland	
Number of cable glands x size of the screwed joint	1 x M16	
Short-circuit protection	3 A gG	
Weight	0.12 kg	0.17 kg

## Dimensional drawings

**i10-HA113**

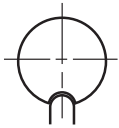
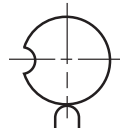
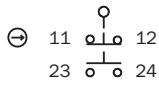
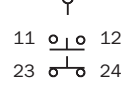
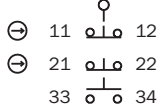
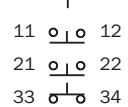


**i10-HB213**



Dimensions in mm

## Switching elements

	Not actuated	Actuated
		
Switching element 11		
Switching element 21		

**Switching element 11:**

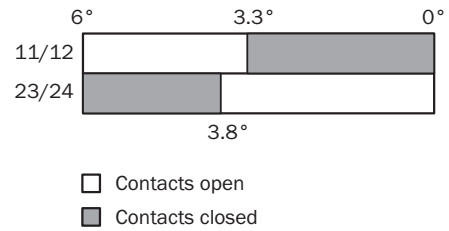
1 positive action N/C contact + 1 N/O contact

**Switching element 21:**

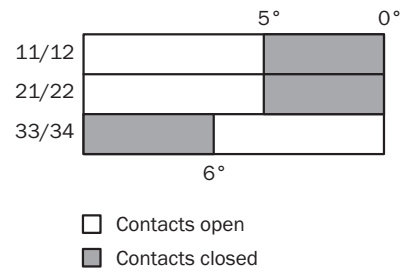
2 positive action N/C contacts + 1 N/O contact

## Actuator travel diagram

**i10-HA113**

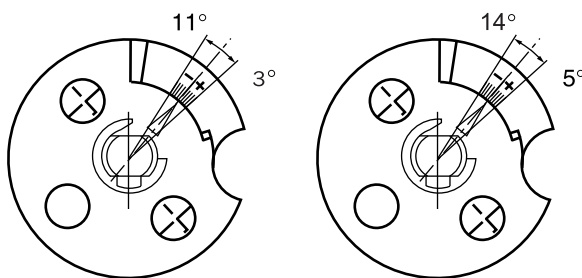


**i10-HB213**



## Mounting

K




**Adjusting the switching angle**

The switching angle can be set in the range of 3° ... 11° (i10HA) or 5° ... 14° (i10HB).

After functional testing, safety hinge switches and switch cams must be pinned together to ensure a secure connection.

## Accessories

**Cable gland**

Figure	Type	Part no.
	Cable gland M16	5309163

## Technical data overview

Number of positive action N/C contacts	2
Number of N/O contacts	1
Type of shaft	Hollow shaft
Length of the shaft	36.5 mm
Housing material	Metal
Enclosure rating	IP 66

## Product description

- Safety hinge switch for direct installation of gate and door hinges
- Hollow shaft design
- 3 contacts

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	1	i110-HA213	6025072



- Die-cast zinc housing
- Hollow shaft stainless steel
- Cable gland M20
- Adjustable switching point
- Enclosure rating IP 66



K

Further information	Page
→ Technical specifications	K-82
→ Dimensional drawings	K-83
→ Switching elements	K-84
→ Actuator travel diagram	K-84
→ Mounting	K-85
→ Accessories	K-85
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

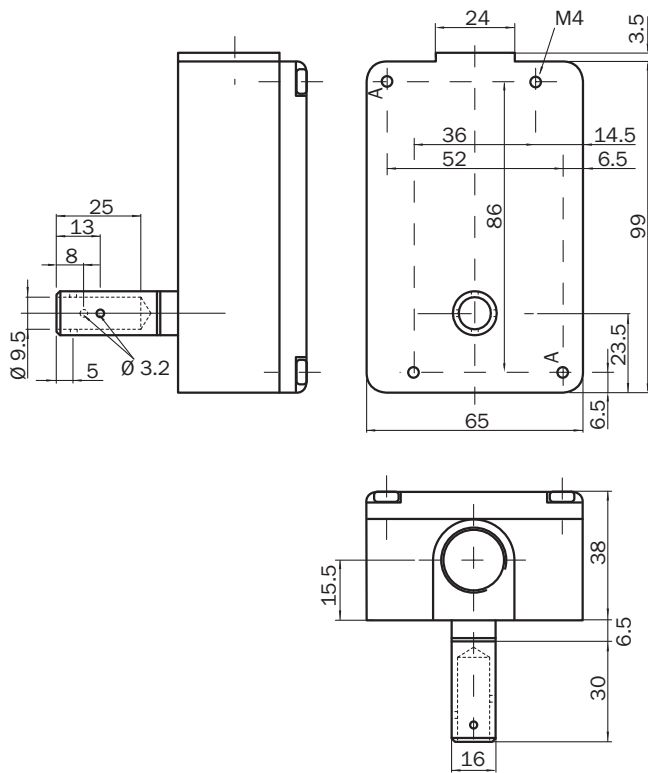
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Housing material	Die-cast zinc
Surface treatment	Varnished
Enclosure rating	IP 66
Safety related parameters	
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load
Mechanical life	1 x 10 <sup>6</sup> switching cycles
Ambient operating temperature from ... to	-25 °C ... +80 °C
Minimum actuation torque	0.12 Nm
Actuation frequency	Max. 3600/h
Switching principle	Slow action switching element
Switching angle	Adjustable 5° ... 11°
Number of positive action N/C contacts	2
Number of N/O contacts	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13
Rated operating current (voltage)	3 A (240 V AC), 2 A (24 V DC)
Rated insulation voltage U <sub>i</sub>	250 V
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC
Minimum switching voltage	5 V DC
Minimum switching current (switching voltage)	5 mA (5 V DC)
Connection type	Cable gland
Number of cable glands x size of the screwed joint	1 x M20
Maximum connection cable cross-section	1.5 mm <sup>2</sup>
Short-circuit protection	3 A gG
Weight	0.45 kg





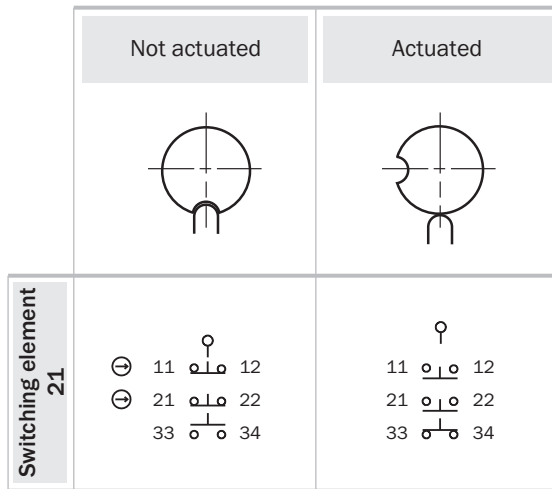
## Dimensional drawings



Dimensions in mm



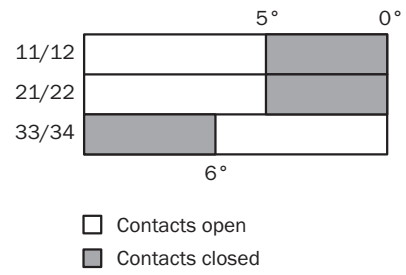
## Switching elements



**Switching element 21:**

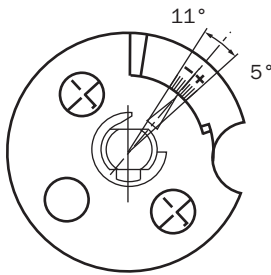
2 positive action N/C contacts + 1 N/O contact

## Actuator travel diagram



K

## Mounting




### Adjusting the switching angle

The switching angle can be set within the range of 5° ... 11°. After functional testing, safety hinge switches and switch cams must be pinned together to ensure a secure connection.

## Accessories

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164

# Non-contact safety switches

## Technical overview and applications

Non-contact safety switches are used wherever movable guards, no wear and tear, vibration resistance and strict hygiene provisions are required.

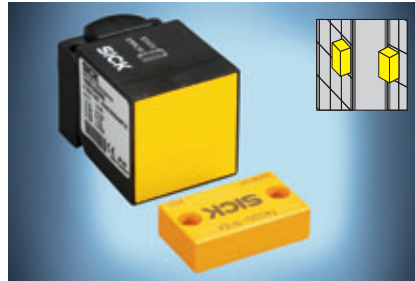
SICK offers non-contact safety switches with three different operating principles: magnetic, transponder and inductive.

In addition, different designs are available for each sensor: cuboid or cylindrical. As a result, the optimal safety switch for the application can be selected.



### Magnetic safety switches

- The use of magnetic safety switches is an advantage in areas with high contamination or strict hygiene regulations.
- In applications where precise guiding of the protective device is difficult, magnetic safety switches from SICK are the right choice.
- When combined with a safe evaluation unit from SICK, applications up to performance level e can be solved.



### Transponder safety switches

- Transponder safety switches are used in applications which require a protection against tampering.
- The saved actuator code is the same as the safety switch code, ensuring protection against tampering.
- Transponder safety switches also have a high response range. This offers advantages during installation and increases the availability during the machine's life.
- Variants allow users to connect up to 20 safety switches in a series.



### Inductive safety switches

- Inductive safety switches are used for non-contact and wear-free position detection.
- They do not require a special counter part, but detect metal such as VA or ST37.
- In comparison with electro-mechanical position switches, inductive safety switches have a wide response range and are therefore not affected by mounting tolerances, which simplifies installation and adjustment.

#### Applications:

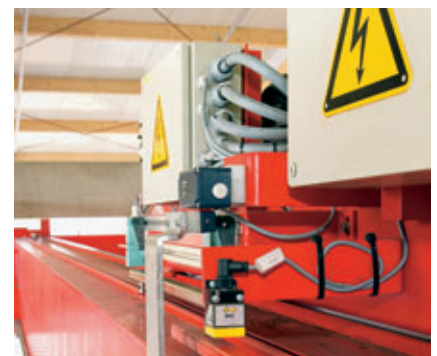
In areas with high contamination or where strict hygiene regulations apply

#### Applications:



Ideal, if protection against tampering is necessary, vibrations occur or high tolerances are required

#### Applications:

The switches are maintenance-free, making them ideal for the protection or position monitoring of points which are not easily accessible





Safety application	Sensor principle <sup>1)</sup>	Up to performance level	Safe switch on distance $S_{ao}$ (mm)	Individual coding	Direct connection to safe control solutions	Product	Page
	Magnetic	PL e <sup>2)</sup>	5	–	✓	RE300	L-2
			3 / 6	–	✓	RE11 RE21 RE31	L-6
			7 / 9	–	✓	RE13 RE23	L-13
			9	–	✓	RE27	L-18
	Transponder	PL e	5 <sup>3)</sup>	✓	–	T4000 Standard	L-23
			10 <sup>3)</sup>	✓	–	T4000 Multi	L-30
			18 <sup>4)</sup>	✓	✓	T4000 Compact	L-36
			15 <sup>4)</sup>	✓	✓	T4000 Direct	L-42
	Inductive	PL e	4 / 6 / 12 / 15	–	✓	IN4000 Standard	L-48
		PL e	15	–	✓	IN4000 Direct	L-52

<sup>1)</sup> Explanation see page L-0

<sup>2)</sup> In combination with suitable safety device

<sup>3)</sup> Depending on evaluation unit

<sup>4)</sup> Depending on actuator



- Actuator with coding
- Sensor and actuator with IP 67 enclosure rating
- Direct connection of the magnetic safety switch to safe control possible



## Technical data overview

Sensor principle	Magnetic
Category	Up to category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	Up to PL e (EN ISO 13849) <sup>1)</sup>
Type of output	Reed contacts
Number of N/C contacts	1
Number of N/O contacts	1

<sup>1)</sup> In combination with suitable safety device

## Product description

The RE300 is a magnetically coded non-contact safety switch, whose contacts are operated with the corresponding RE300 element. The sensor is equipped with two complementary switching contacts in NO/NC combination.

The switching signals are evaluated by suitable safety evaluation electronics such as a safety programmable logic controller.

## Ordering information

System part	Connection type	Cable length	Safe switch on distance $S_{ao}$	Type	Part no.
Sensor & actuator	Cable	3 m	5 mm	RE300-DA03P	6025080
		10 m	5 mm	RE300-DA10P	6025079

Further information	Page
→ Internal circuitry	L-4
→ Mounting	L-4
→ Response range	L-5
→ Accessories	L-5
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

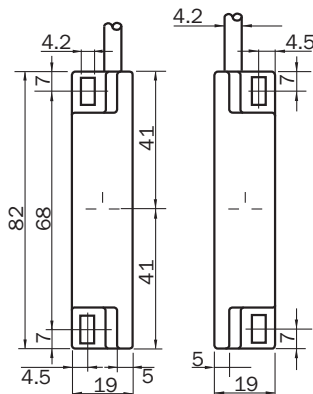
→ You can find combinable evaluation units in the product finder under [www.mysick.com](http://www.mysick.com)

Type	RE300-DA03P	RE300-DA10P
Sensor principle	Magnetic	
Safety related parameters	Category Performance level B <sub>10d</sub> parameter	
	Up to category 4 (EN ISO 13849) <sup>1)</sup> Up to PL e (EN ISO 13849) <sup>1)</sup> 2 x 10 <sup>7</sup> switching cycles, with small load	
Housing material	ABS shape	
Enclosure rating	IP 67	
Ambient operating temperature from ... to	-10 °C ... +55 °C	
Shock resistance	30 g, 11 ms (IEC 60068-2-29)	
Vibration resistance	10 Hz ... 55 Hz, 0.35 mm (IEC 60068-2-6)	
Maximum switching voltage	30 V DC	
Maximum switching current	30 mA	
Connection type	Cable	
Cable length	3 m	10 m
Cable material	PVC	
Type of output	Reed contacts	
Number of N/C contacts	1	
Number of N/O contacts	1	
Weight	0.168 kg	0.322 kg
Status display	-	
Safe switch on distance S <sub>ao</sub>	5 mm	
Safe switch off distance S <sub>ar</sub>	15 mm	

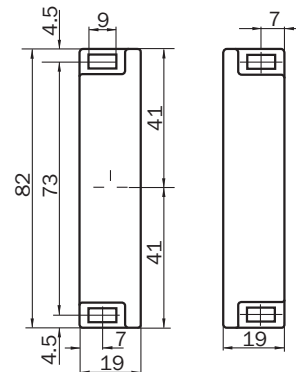
<sup>1)</sup> In combination with suitable safety device

## Dimensional drawings

### Sensor



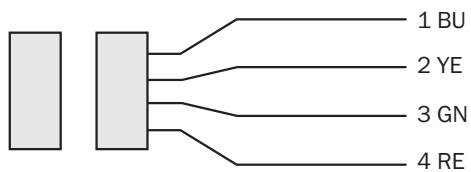
### Actuator



Dimensions in mm

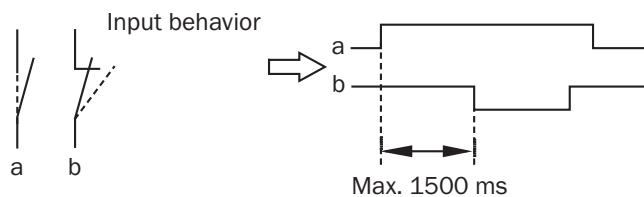
## Internal circuitry

### Sensor connections



1 BU	N/O contact
2 YE	
3 GN	N/C contact
4 RE	

### Sensor timing



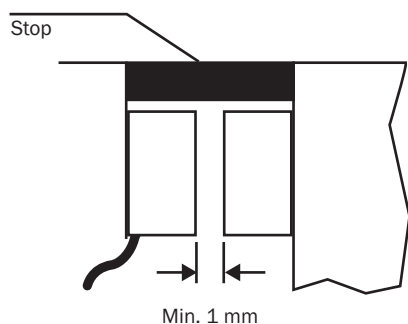
### Output behavior



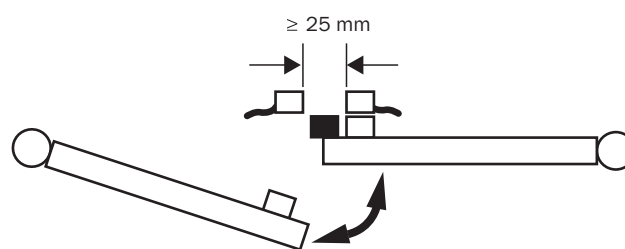
### Direct connection of the sensor to safe control

When evaluating the sensor signals with a safe control, both contact signals **MUST** be monitored. Both contacts must switch complementarily with a maximum discrepancy time of 1500 ms; this time must be monitored by the evaluation electronics (safe control).

## Mounting



Minimum distance between sensor and actuator

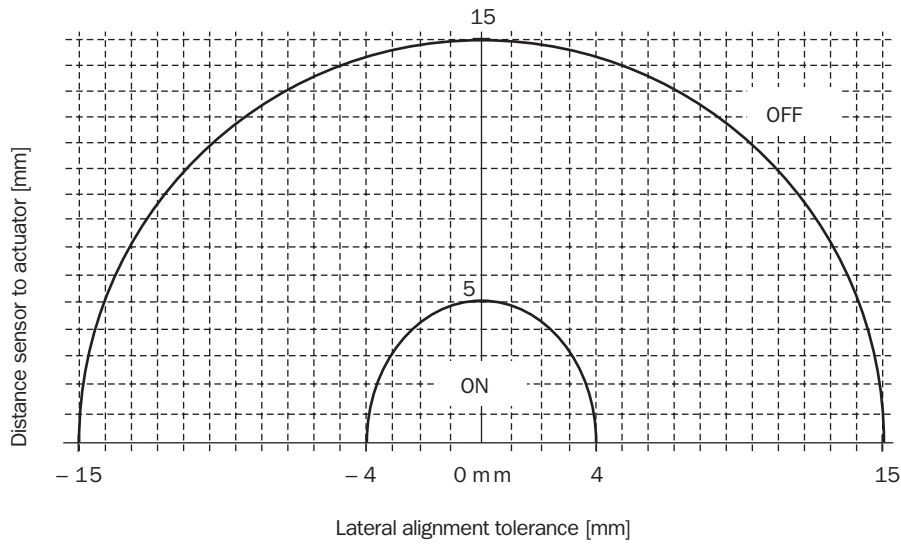
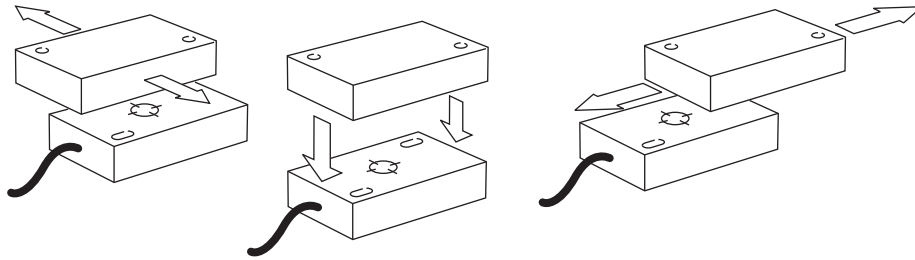


Minimum distance to neighboring sensors






## Response range



## Accessories

### Actuator

Figure	Type	Part no.
	RE300-KA	5311140



- Actuator with coding
- Magnetic safety switch response range up to 6 mm
- Magnetic safety switch and actuator with IP 67 enclosure rating
- Three variants
- Direct connection of the magnetic safety switch to safe control possible



## Technical data overview

Sensor principle	Magnetic
Category	Up to category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	Up to PL e (EN ISO 13849) <sup>1)</sup>
Type of output	Reed contacts
Number of N/C contacts	1
Number of N/O contacts	1

<sup>1)</sup> In combination with suitable safety device

## Product description

The RE11, RE21 and RE31 are magnetically coded safety switches; the switch's contacts are operated by the related actuator. The safety switch is equipped with two complementary switching contacts in a

normally open/normally closed combination (NO/NC). The switching signals are sampled by suitable safety-related evaluation electronics, e.g., a safe programmable logic controller.

## Ordering information

System part	Design	Housing diameter	Connection type	Cable length	Safe switch on distance $S_{ao}$	Type	Part no.
Sensor & actuator	Cuboid	-	Cable	3 m	3 mm	RE11-DA03	6034292
				5 m	3 mm	RE11-DA05	6035616
			M8 plug connector, 4-pin	-	3 mm	RE11-DAC	6036766
				Cable	3 m	6 mm	RE21-DA03
			5 m		6 mm	RE21-DA05	6035617
			M8 plug connector, 4-pin	-	6 mm	RE21-DAC	6036767
	Cylindrical	M30		Cable	3 m	6 mm	RE31-DA03
			5 m		6 mm	RE31-DA05	6035618
			M8 plug connector, 4-pin	-	6 mm	RE31-DAC	6036768

Further information	Page
→ Dimensional drawings	L-8
→ Internal circuitry	L-10
→ Mounting	L-11
→ Response range	L-11
→ Accessories	L-12
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	RE11-DA03	RE11-DA05	RE11-DAC	RE21-DA03	RE21-DA05	RE21-DAC	RE31-DA03	RE31-DA05	RE31-DAC
Sensor principle	Magnetic								
Safety related parameters	Category Performance level B <sub>10d</sub> parameter								
	Up to category 4 (EN ISO 13849) <sup>1)</sup> Up to PL e (EN ISO 13849) <sup>1)</sup> 2 x 10 <sup>7</sup> switching cycles, with small load								
Housing material	Glass-fiber reinforced PPS								
Enclosure rating	IP 67								
Ambient operating temperature from ... to	-20 °C ... +60 °C								
Shock resistance	30 g, 11 ms (according to EN 60947-5-3)								
Vibration resistance	10 Hz ... 55 Hz, 1 mm (according to EN 60947-5-3)								
Maximum switching voltage	30 V DC								
Maximum switching current	400 mA								
Connection type	Cable		M8 <sup>2)</sup>	Cable		M8 <sup>2)</sup>	Cable		M8 <sup>2)</sup>
Cable length	3 m	5 m	-	3 m	5 m	-	3 m	5 m	-
Cable material	PVC		-	PVC		-	PVC		-
Type of output	Reed contacts								
Number of N/C contacts	1								
Number of N/O contacts	1								
Weight	186 g	266 g	32 g	170 g	255 g	62 g	283 g	365 g	51 g
Status display	-								
Safe switch on distance S <sub>ao</sub>	3 mm			6 mm					
Safe switch off distance S <sub>ar</sub>	12 mm			31 mm			17 mm		

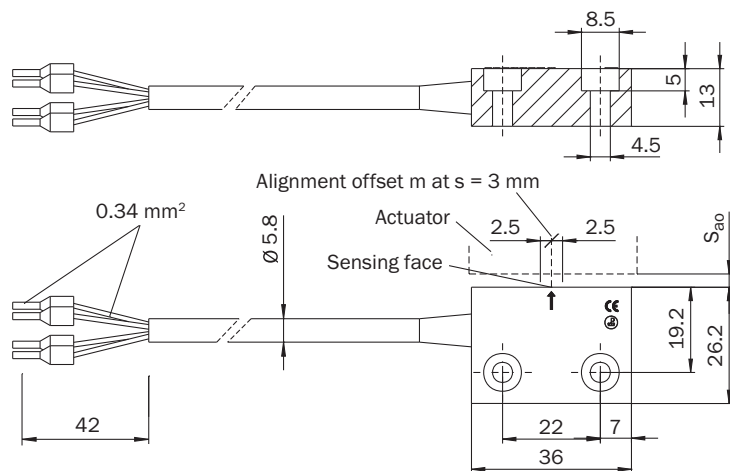
<sup>1)</sup> In combination with suitable safety device

<sup>2)</sup> Plug connector, 4-pin



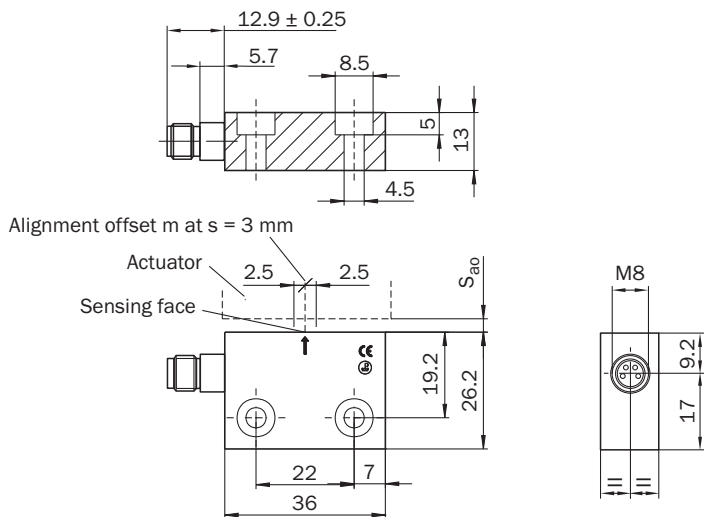
## Dimensional drawings

### RE11-DA03, RE11-DA05



The actuators have the same dimensions as the read heads, but without connecting cable.

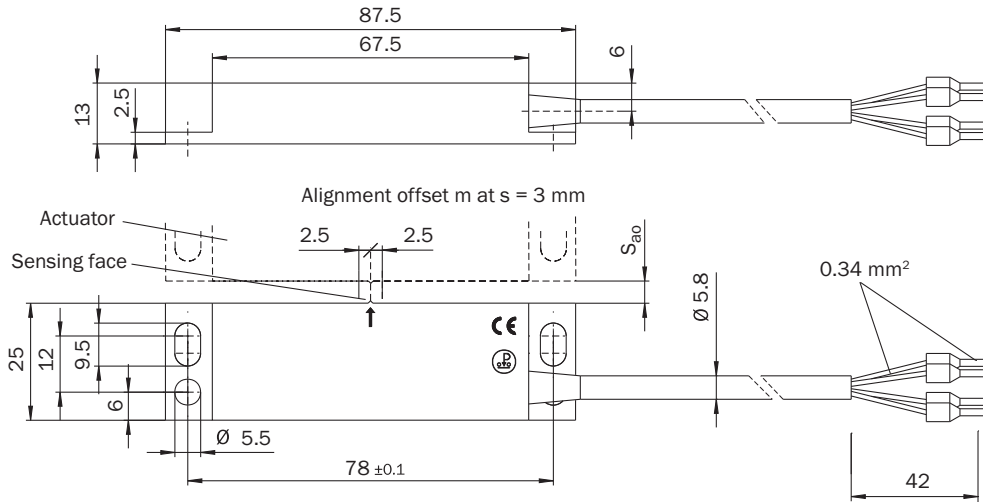
### RE11-DAC



The actuators have the same dimensions as the read heads, but without plug connector.

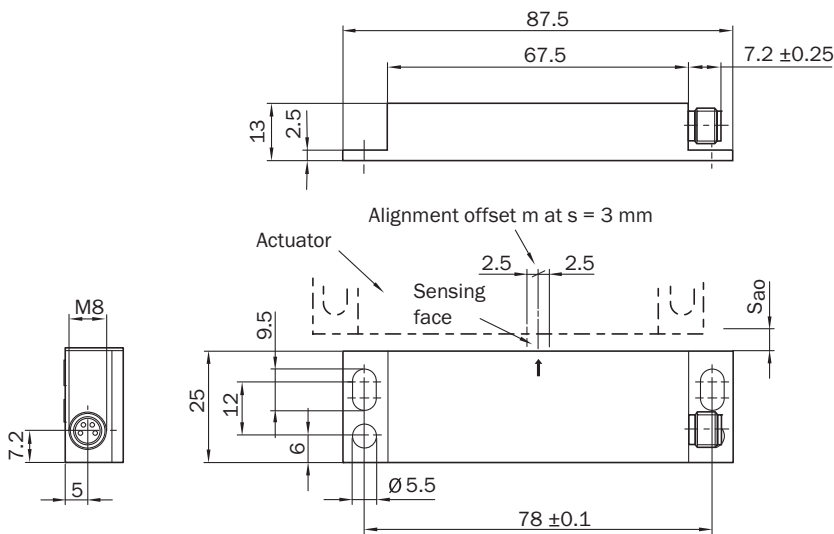
Dimensions in mm

**RE21-DA03, RE21-DA05**



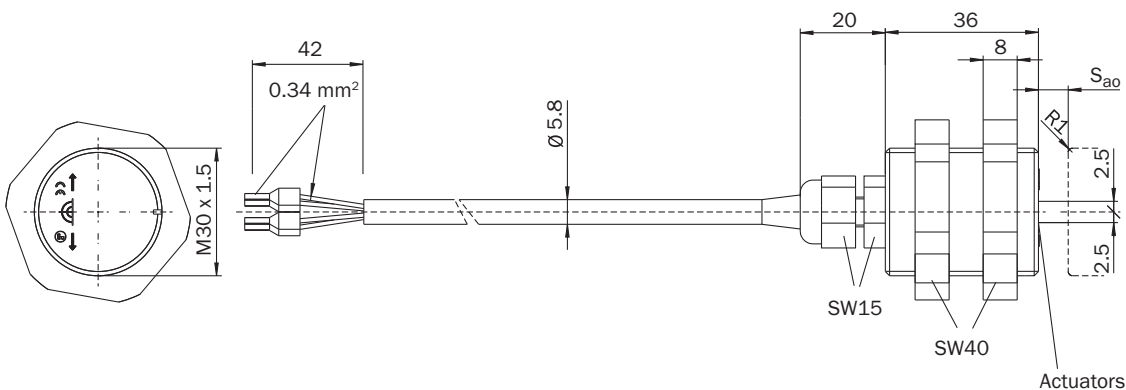
The actuators have the same dimensions as the read heads, but without connecting cable.

**RE21-DAC**



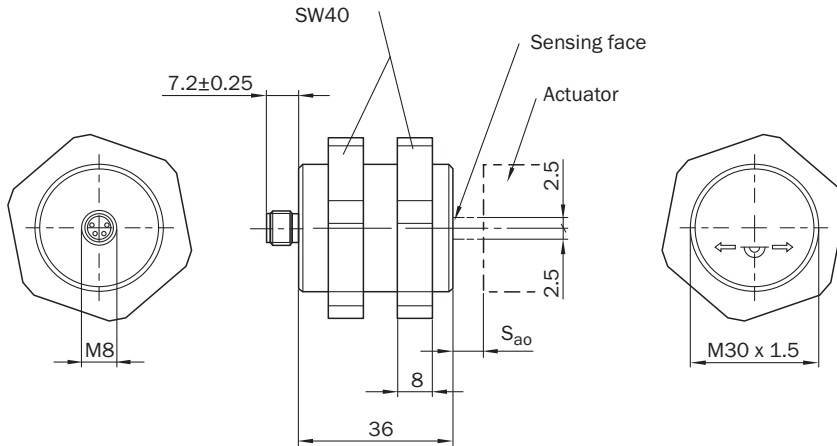
The actuators have the same dimensions as the read heads, but without plug connector.

**RE31-DA03, RE31-DA05 sensor**

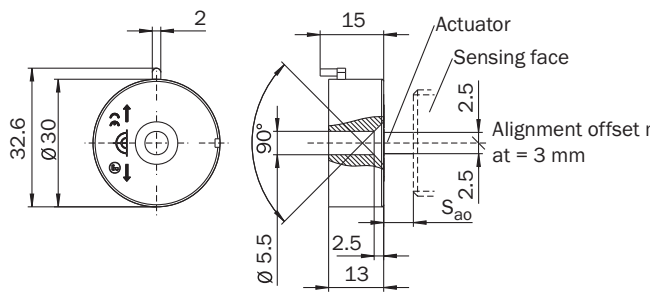


Dimensions in mm

RE31-DAC



RE31-DA03, RE31-DA05, RE31-DAC actuator



Dimensions in mm

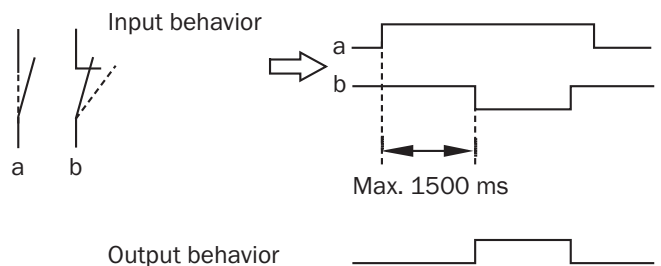
Internal circuitry

Sensor connections



1 BN	N/O contact
2 WH	
3 BU	N/C contact
4 BK	

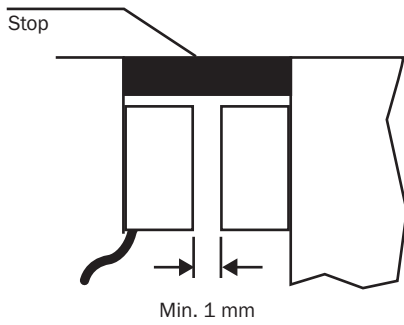
Sensor timing



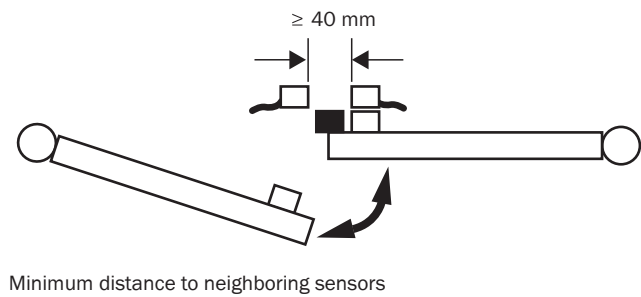
Direct connection of the sensor to safe control

When evaluating the sensor signals with a safe control, both contact signals **MUST** be monitored. Both contacts must switch complementarily with a maximum discrepancy time of 1500 ms; this time must be monitored by the evaluation electronics (safe control).

## Mounting



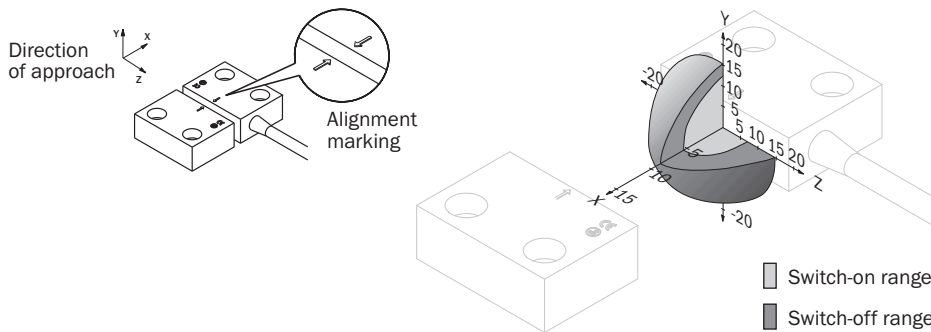
Minimum distance between sensor and actuator



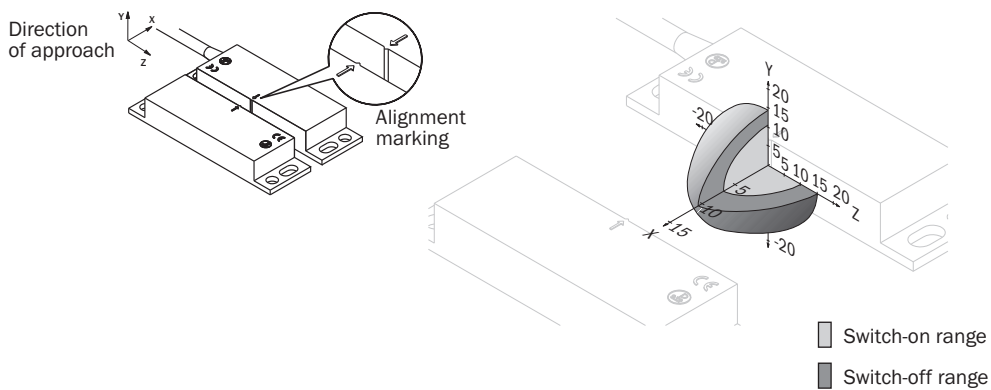
Minimum distance to neighboring sensors

## Response range

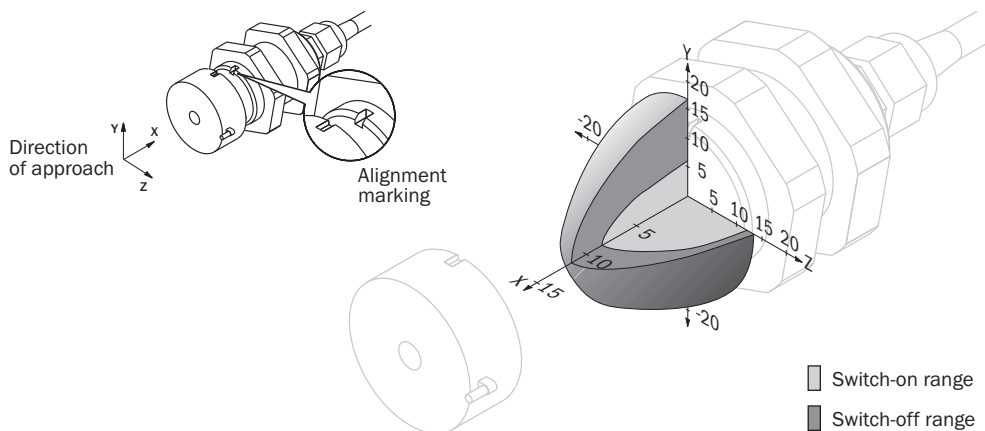
### RE11-DA03, RE11-DA05, RE11-DAC



### RE21-DA03, RE21-DA05, RE21-DAC



RE31-DA03, RE31-DA05, RE31-DAC



## Accessories

### Connectors

Figure	Size of the cable gland	Direction of cable outlet	Cable length	Type	Part no.
	M8, 4-pin	Straight	2 m	DOL-0804-G02M	6009870
			5 m	DOL-0804-G05M	6009872
			10 m	DOL-0804-G10M	6010754
		Angled	2 m	DOL-0804-W02M	6009871
			5 m	DOL-0804-W05M	6009873
			10 m	DOL-0804-W10M	6010755

### Actuators

Figure	Type	Part no.
	RE11-K	5320136
	RE21-K	5320137
	RE31-K	5320138

### Mounting systems

Figure	Description	Packing unit	Type	Part no.
	Spacer	10	RE10-SD	5322315
			RE20-SD	5320067



## Technical data overview

Sensor principle	Magnetic
Category	Up to category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	Up to PL e (EN ISO 13849) <sup>1)</sup>
Type of output	Reed contacts
Number of N/C contacts	0
Number of N/O contacts	2

<sup>1)</sup> In combination with suitable safety device

## Product description

RE13 and RE23 are magnetically coded safety switches; the switch's contacts are operated by the related actuator. The safety switches are equipped with two nor-

mally open contacts (N/O). The switching signals are sampled by suitable safety-related evaluation electronics, e.g., a safe programmable logic controller.

## Ordering information

System part	Design	Connection type	Cable length	Safe switch on distance $S_{ao}$	Type	Part no.
Sensor & actuator	Cuboid	Cable	3 m	7 mm	RE13-DA03	6034333
		M8 plug connector, 4-pin	-	7 mm	RE13-DAC	6036769
				9 mm	RE23-DAC	6036927



- Actuator with coding
- Magnetic safety switch response range up to 7 mm
- Small compact design of magnetic safety switch and actuator
- Magnetic safety switch and actuator with IP 67 enclosure rating
- Direct connection of the magnetic safety switch to safe control possible



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## Technical specifications

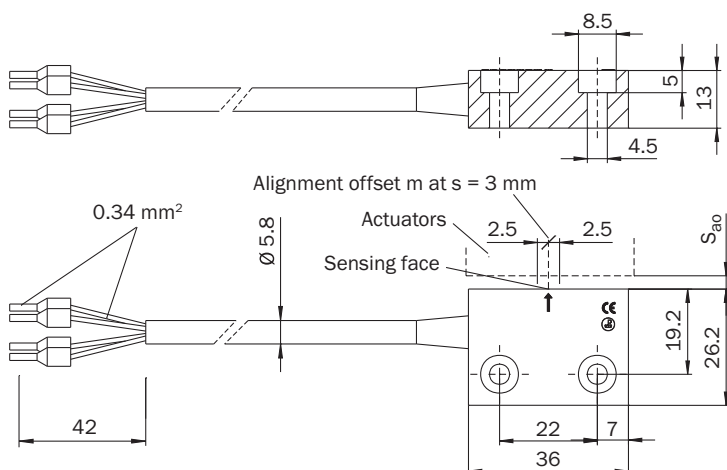
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	RE13-DA03	RE13-DAC	RE23-DAC
Sensor principle	Magnetic		
Safety related parameters	Up to category 4 (EN ISO 13849) <sup>1)</sup> Up to PL e (EN ISO 13849) <sup>1)</sup> 2 x 10 <sup>7</sup> switching cycles, with small load		
Category			
Performance level			
B <sub>10d</sub> parameter			
Housing material	Glass-fiber reinforced PPS		
Enclosure rating	IP 67		
Ambient operating temperature from ... to	-20 °C ... +60 °C		
Shock resistance	30 g, 11 ms (according to EN 60947-5-3)		
Vibration resistance	10 Hz ... 55 Hz, 1 mm (according to EN 60947-5-3)		
Maximum switching voltage	30 V DC		
Maximum switching current	100 mA		
Connection type	Cable	M8 plug connector, 4-pin	
Cable length	3 m	-	
Cable material	PVC	-	
Type of output	Reed contacts		
Number of N/C contacts	0		
Number of N/O contacts	2		
Weight	0.28 kg	0.032 kg	0.062 kg
Status display	-		
Safe switch on distance S <sub>ao</sub>	7 mm		9 mm
Safe switch off distance S <sub>ar</sub>	20 mm		22 mm

<sup>1)</sup> In combination with suitable safety device

## Dimensional drawings

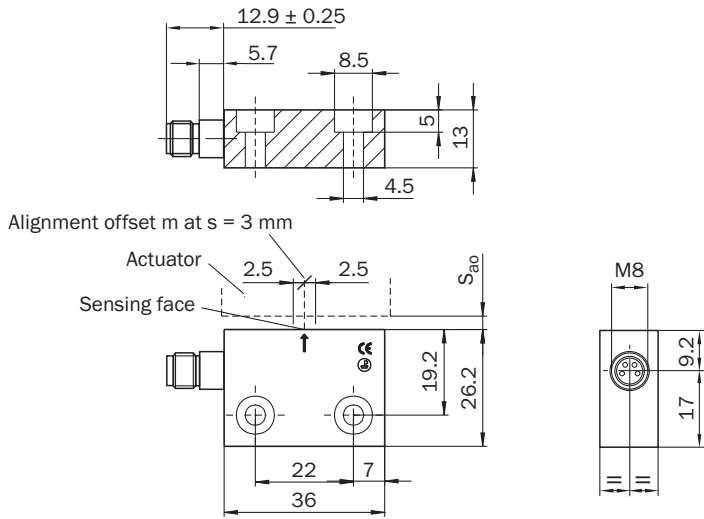
### RE13-DA03



The actuators have the same dimensions as the read heads, but without connecting cable.

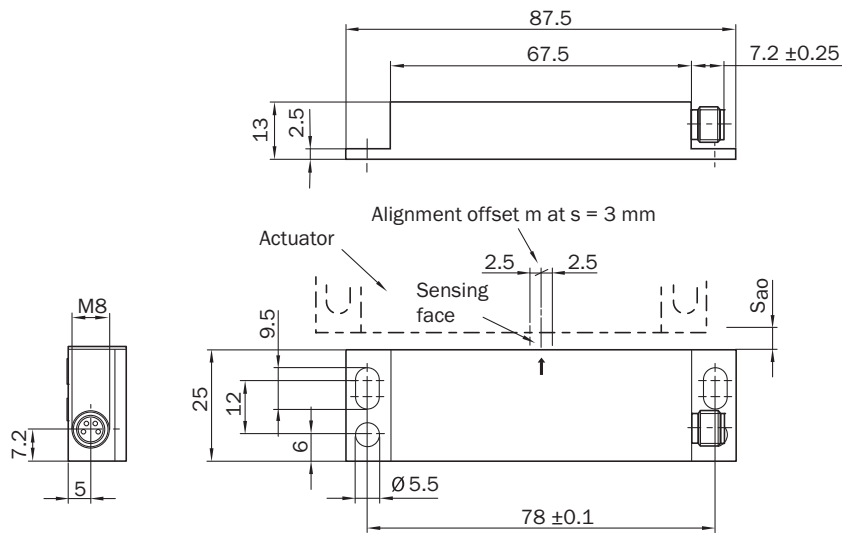
Dimensions in mm

**RE13-DAC**



The actuators have the same dimensions as the read heads, but without plug connector.

**RE23-DAC**



The actuators have the same dimensions as the read heads, but without plug connector.

Dimensions in mm

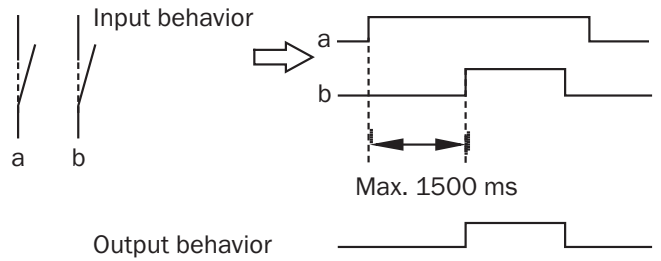
## Internal circuitry

### Sensor connections



1 BN	N/O contact
2 WH	
3 BU	N/O contact
4 BK	

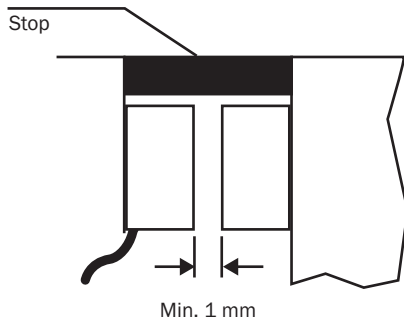
### Sensor timing



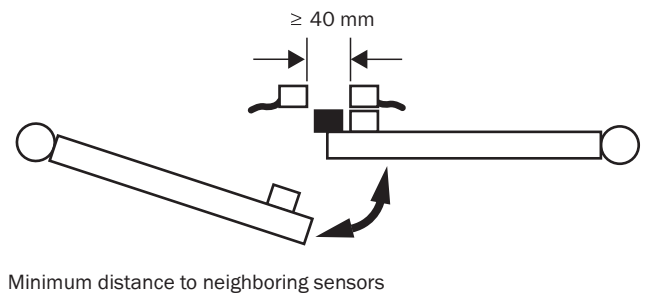
### Direct connection of the sensor to safe control

When evaluating the sensor signals with a safe control, both contact signals **MUST** be monitored. Both contacts must switch complementarily with a maximum discrepancy time of 1500 ms; this time must be monitored by the evaluation electronics (safe control).

## Mounting

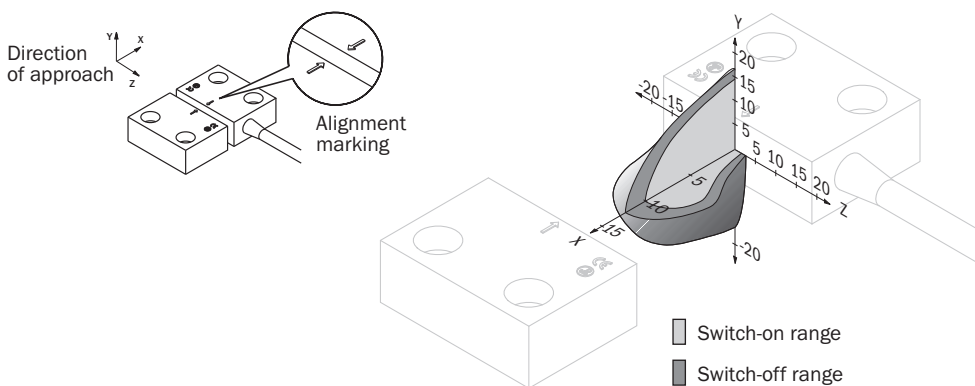


Minimum distance between sensor and actuator

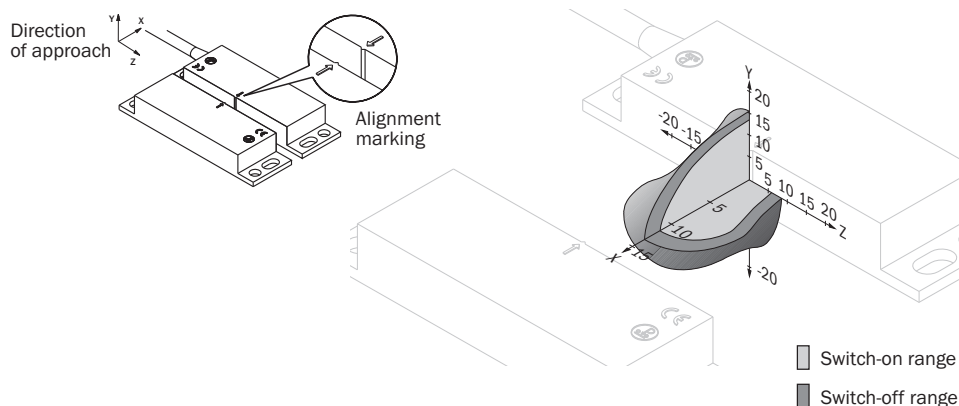


## Response range

### RE13-DA03, RE13-DAC




**RE23-DAC**





## Accessories



### Connectors

Figure	Size of the cable gland	Direction of cable outlet	Cable length	Type	Part no.
	M8, 4-pin	Straight	2 m	DOL-0804-G02M	6009870
			5 m	DOL-0804-G05M	6009872
			10 m	DOL-0804-G10M	6010754
		Angled	2 m	DOL-0804-W02M	6009871
			5 m	DOL-0804-W05M	6009873
			10 m	DOL-0804-W10M	6010755

### Actuators

Figure	Type	Part no.
	RE13-K	5320139
	RE23-K	5313595

### Mounting systems

Figure	Description	Packing unit	Type	Part no.
	Spacer	10	RE10-SD	5322315
			RE20-SD	5320067



- Actuator with coding
- Magnetic safety switch response range up to 9 mm
- Magnetic safety switch with LED status display
- Magnetic safety switch and actuator with IP 67 enclosure rating
- Direct connection of the magnetic safety switch to safe control possible



## Technical data overview

Sensor principle	Magnetic
Category	Up to category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	Up to PL e (EN ISO 13849) <sup>1)</sup>
Type of output	Reed contacts
Number of N/C contacts	0
Number of N/O contacts	3
Status display	✓

<sup>1)</sup> In combination with suitable safety device

## Product description

The RE27 is a magnetically coded safety switch; the switch's contacts are operated by the related actuator. The safety switch is equipped with two complementary switching contacts (N/O). The read head for the RE27 also has a normally open contact

(N/O) with integrated LED for the indication of the output state. The switching signals are sampled by suitable safety-related evaluation electronics, e.g., a safe programmable logic controller.

## Ordering information

System part	Design	Connection type	Cable length	Safe switch on distance $S_{ao}$	Type	Part no.
Sensor & actuator	Cuboid	Cable	5 m	9 mm	RE27-DA05L	6034343
			10 m	9 mm	RE27-DA10L	6035619
			20 m	9 mm	RE27-DA20L	6035003
		Cable with plug, M12, 8-pin	0.3 m	9 mm	RE27-DAC	6039760

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

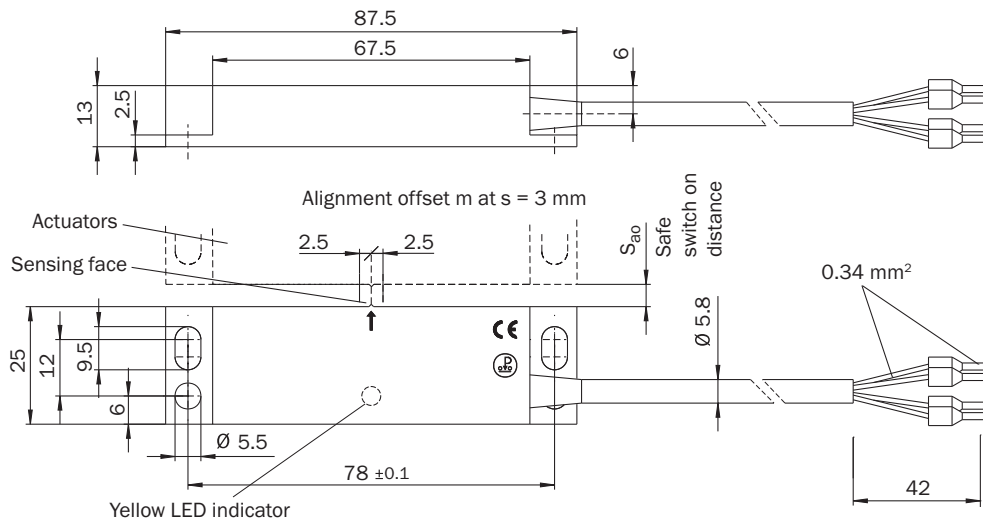
Type	RE27-DA05L	RE27-DA10L	RE27-DA20L	RE27-DAC
Sensor principle	Magnetic			
Safety related parameters				
Category	Up to category 4 (EN ISO 13849) <sup>1)</sup>			
Performance level	Up to PL e (EN ISO 13849) <sup>1)</sup>			
B <sub>10d</sub> parameter	2 x 10 <sup>7</sup> switching cycles, with small load			
Housing material	Glass-fiber reinforced PPS			
Enclosure rating	IP 67			
Ambient operating temperature from ... to	-20 °C ... +60 °C			
Shock resistance	30 g, 11 ms (according to EN 60947-5-3)			
Vibration resistance	10 Hz ... 55 Hz, 1 mm (according to EN 60947-5-3)			
Maximum switching voltage	30 V DC			
Maximum switching current	100 mA			
Output state indication with LED				
Maximum switching voltage	30 V DC			
Maximum switching current	10 mA			
Connection type	Cable			Cable with plug, M12, 8-pin
Cable length	5 m	10 m	20 m	0.3 m
Cable material	PVC			
Type of output	Reed contacts			
Number of N/C contacts	0			
Number of N/O contacts	3			
Weight	0.156 kg	0.73 kg	1.878 kg	0.139 kg
Status display	✓			
Safe switch on distance S <sub>ao</sub>	9 mm			
Safe switch off distance S <sub>ar</sub>	20 mm			

<sup>1)</sup> In combination with suitable safety device



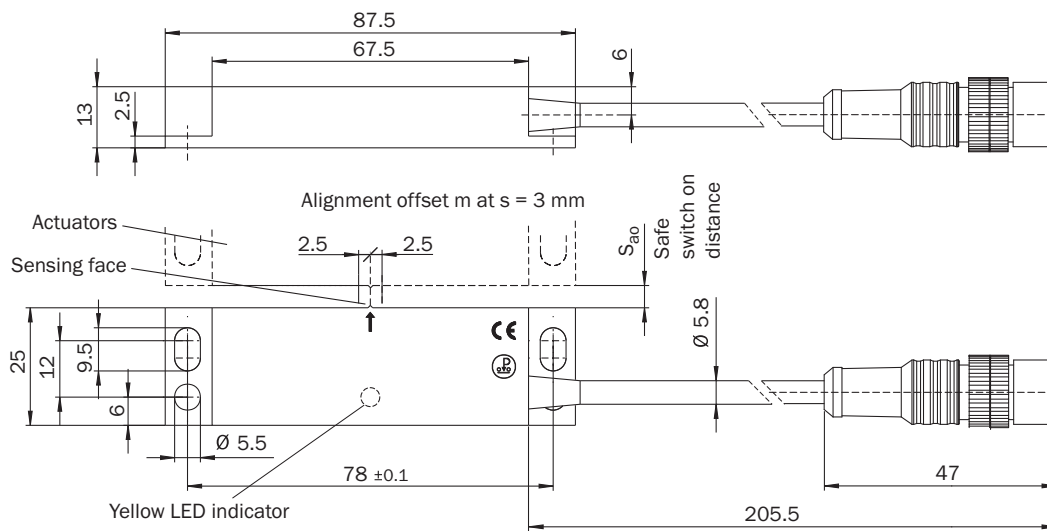
## Dimensional drawings

### RE27-DA05L, RE27-DA10L, RE27-DA20L



The actuators have the same dimensions as the read heads, but without connecting cable.

### RE27-DAC



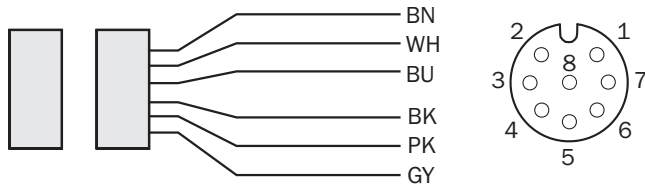
The actuators have the same dimensions as the read heads, but without connecting cable.

Dimensions in mm



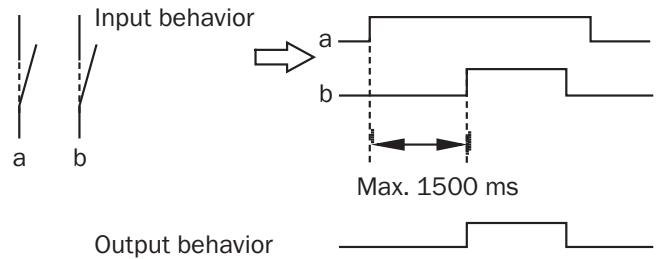
## Internal circuitry

### Sensor connections



7 BN	N/O contact
1 WH	
4 BU	N/O contact
6 BK	
5 PK	N/O contact with LED
8 GY	

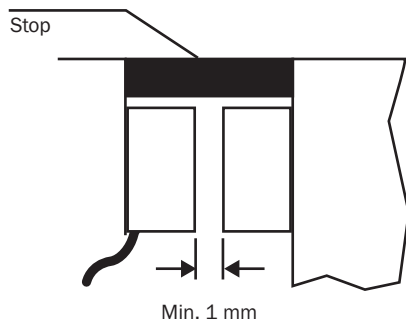
### Sensor timing



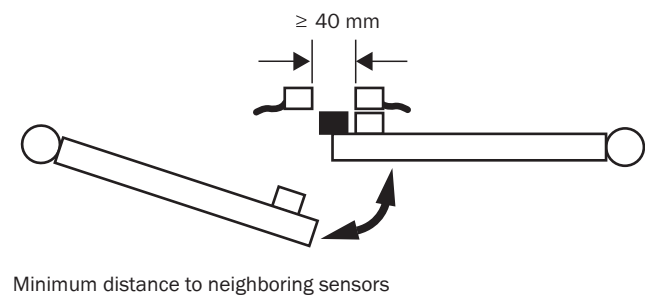
### Direct connection of the sensor to safe control

When evaluating the sensor signals with a safe control, both contact signals **MUST** be monitored. Both contacts must switch complementarily with a maximum discrepancy time of 1500 ms; this time must be monitored by the evaluation electronics (safe control).

## Mounting

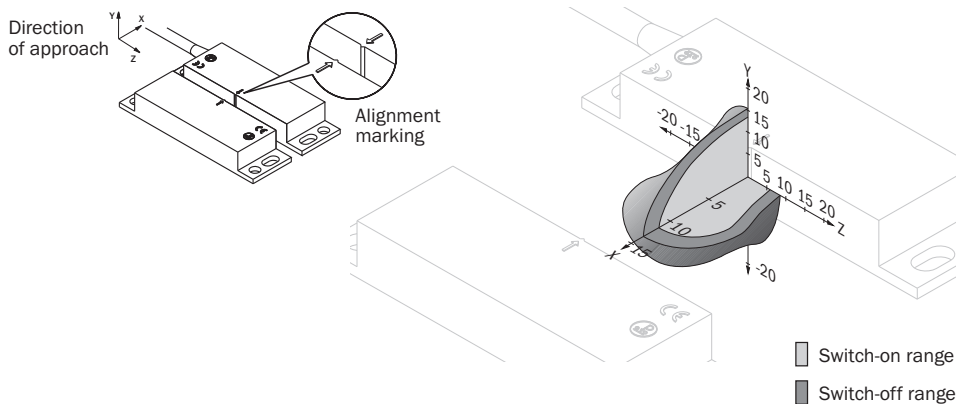


Minimum distance between sensor and actuator




Minimum distance to neighboring sensors

## Response range



## Accessories

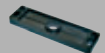
### Connecting cables

Figure	Size of the cable gland	Direction of cable outlet	Cable length	Type	Part no.
	M12, 8-pin	Straight	5 m	DOL-1208-G05MA	6020993
			10 m	DOL-1208-G10MA	6022152
			15 m	DOL-1208-G15MA	6022153
			30 m	DOL-1208-G30MA	6022242

### Actuator

Figure	Type	Part no.
	RE27-K	5320151

### Mounting systems

Figure	Description	Packing unit	Type	Part no.
	Spacer	10	RE20-SD	5320067



## Technical data overview

Sensor principle	Transponder
Safety integrity level	SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of non-contact safety switches	1
Type of output	Relay
Number of safe outputs (N/O)	2
Number of application diagnostic outputs	1 x semiconductor, p-switching

## Product description

The T4000 Standard non-contact safety switch system comprises of the following components:

- 1 sensor
- 1 coded actuator (unique copy)
- 1 evaluation unit

The evaluation unit is further equipped with:

- 1 solid-state application diagnostic output
- 2 LED status displays

The ATEX version of the T4000 Standard non-contact safety switch is approved for use in Ex zone 2.

## Ordering information

System part	Connection type	Cable length	ATEX approval	Type	Part no.
Evaluation unit	Plug-in terminals	-	-	T4000-1RBA01	6012147
			✓ <sup>1)</sup>	T4000-1RBB01	6022315
Sensor	Connector	_ 2)	-	T4000-DNAC	6021912
			✓ <sup>1)</sup>	T4000-DNBC	6024882
	Cable	5 m	-	T4000-DNA05P	6012144
		10 m	-	T4000-DNA10P	6012145
		15 m	-	T4000-DNA15P	6012146
Actuator	-	-	-	T4000-1KBA	5306531
			✓ <sup>1)</sup>	T4000-1KBB	5319829

<sup>1)</sup> In order to comply with the ATEX directive, only devices with ATEX approval shall be combined: evaluation unit, sensor and actuator

<sup>2)</sup> Connecting cable not supplied with delivery



- High protection against manipulation through individually coded actuator
- Small compact design of sensor and actuator
- Sensor and actuator with IP 67 protection
- Version with ATEX approval for use in Ex zone 2



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→ Response range	L-28
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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### Evaluation unit

Type	T4000-1RBA01	T4000-1RBB01
Safety related parameters <sup>1)</sup>		
Safety integrity level	SILCL2 (EN 62061)	
Category	Category 3 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	4.3 x 10 <sup>-8</sup> , with < 34.600 switching cycles p.a. 8.8 x 10 <sup>-8</sup> , with < 90.000 switching cycles p.a.	
T <sub>M</sub> (Mission Time)	20 years, with < 34.600 switching cycles p.a. 8 years, with < 90.000 switching cycles p.a.	
Classification in compliance with IEC/EN 60947-5-3	PDF-M	
Classification according to cULus	Class 2	
Note on operating voltage	Operation with UL-class 2 power supply only	
External fuse	At supply voltage 0.25 A ... 8 A	
Maximum switching voltage	60 V DC/30 V AC	
Housing material	Plastic PA6.6	
Enclosure rating	IP 20	
ATEX marking	-	Ex mark II (3) G [Ex nL] IIC <sup>2)</sup>
Ambient operating temperature from ... to	0 °C ... +55 °C	
Protection class	III	
Contamination rating	2	
Shock resistance	30 g, 11 ms (IEC 60068-2-27)	
Vibration resistance	10 Hz ... 55 Hz, 0.5 mm (IEC 60068-2-6)	
Operating voltage	24 V DC (21 V DC ... 27 V DC)	
Number of non-contact safety switches	1	
Connection type	Plug-in terminals	
Rated insulation voltage U <sub>i</sub>	63 V	
Rated impulse withstand voltage U <sub>imp</sub>	1500 V AC	
Type of output	Relay	
Number of safe outputs (N/O)	2	
Number of application diagnostic outputs	1 x semiconductor, p-switching	
Short-circuit protection	6 A gG	
Usage category in compliance with IEC/EN 60947-5-1	AC-12/DC-12, AC-14/DC-13	
Rated operating current (voltage)	0.3 A (60 V AC) 50 Hz, 6 A (30 V AC) 50 Hz, 0.3 A (60 V DC), 6 A (30 V DC), 2 A (30 V AC) 50 Hz, 3 A (24 V DC)	
Weight	0.327 kg	
Out indication	✓	
Error indication	✓	
Status display	✓	
Switching delay from state change	180 ms	

<sup>1)</sup> With maximum switch load

<sup>2)</sup> Not suitable for the installation in potentially explosive areas

## Sensor

Type	T4000-DNAC	T4000-DNBC	T4000-DNA05P	T4000-DNA10P	T4000-DNA15P
Sensor principle	Transponder				
Housing material	Fortron, glass-fiber reinforced thermoplastic				
Enclosure rating	IP 67				
ATEX marking	-	Ex mark II 3 G Ex nL IIC T70 °C	-		
Ambient operating temperature from ... to	-25 °C ... +70 °C	-25 °C ... +60 °C	-25 °C ... +70 °C		
Connection type	Connector		Cable		
Cable length	-		5 m	10 m	15 m
Maximum cable length	Max. 50 m				
Cable material	-		PVC		
Size of the cable gland	M8		-		
Weight	0.12 kg		0.25 kg	0.39 kg	0.53 kg
Safe switch on distance $S_{ao}$	5 mm <sup>1)</sup> , 10 mm <sup>2)</sup>	10 mm <sup>3)</sup>	5 mm <sup>1)</sup> , 10 mm <sup>2)</sup>		
Safe switch off distance $S_{ar}$	23 mm <sup>1)</sup> , 32 mm <sup>2)</sup>	32 mm <sup>3)</sup>	23 mm <sup>1)</sup> , 32 mm <sup>2)</sup>		
Monitoring time minimum dwell time	0.5 s				

<sup>1)</sup> With evaluation unit T4000-1RBA01

<sup>2)</sup> With evaluation units T4000-1RCA02, T4000-1RCA04

<sup>3)</sup> With evaluation unit T4000-1RBB01

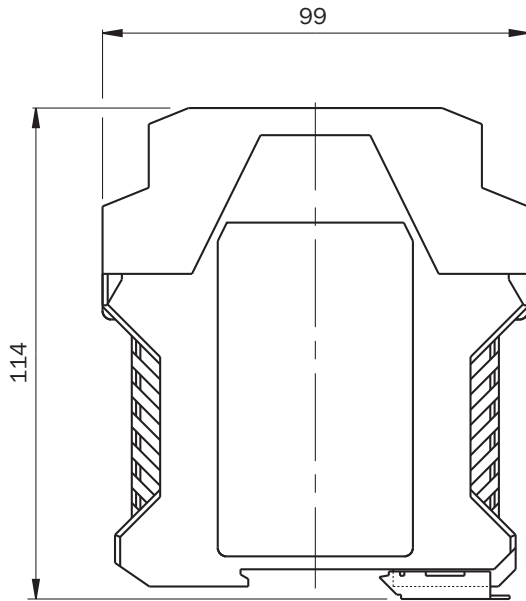
## Actuator

Type	T4000-1KBA	T4000-1KBB
Housing material	Fortron, glass-fiber reinforced thermoplastic	
Enclosure rating	IP 67	
ATEX marking	-	Ex mark II 3 G Ex nL IIC T70 °C
Ambient operating temperature from ... to	-25 °C ... +70 °C	-25 °C ... +60 °C
Weight	30 g	
Monitoring time minimum dwell time	0.5 s	

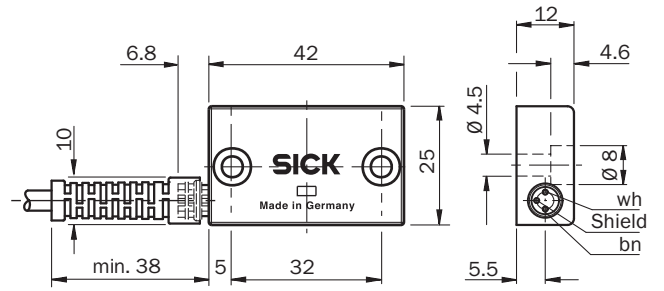


## Dimensional drawings

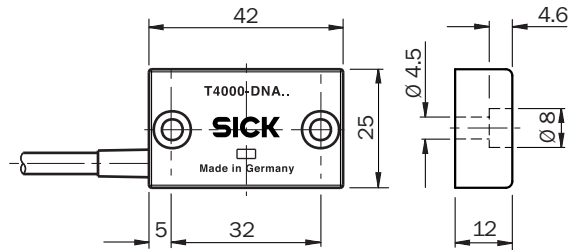
### Evaluation unit



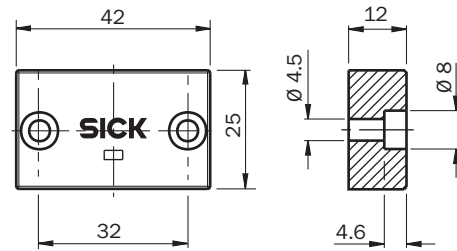
### Sensor connector



### Sensor cable



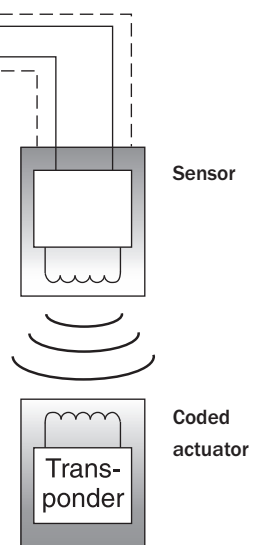
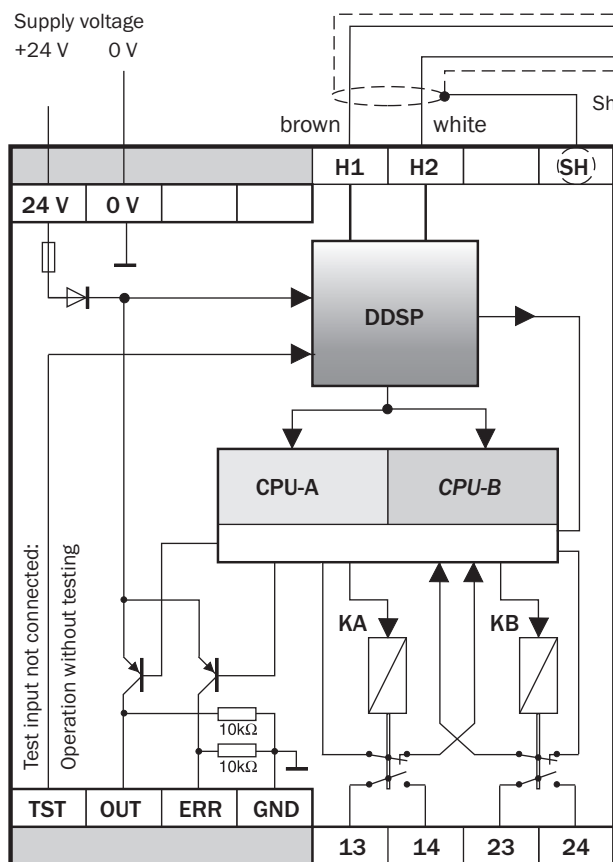
### Actuator



Dimensions in mm



## Internal circuitry



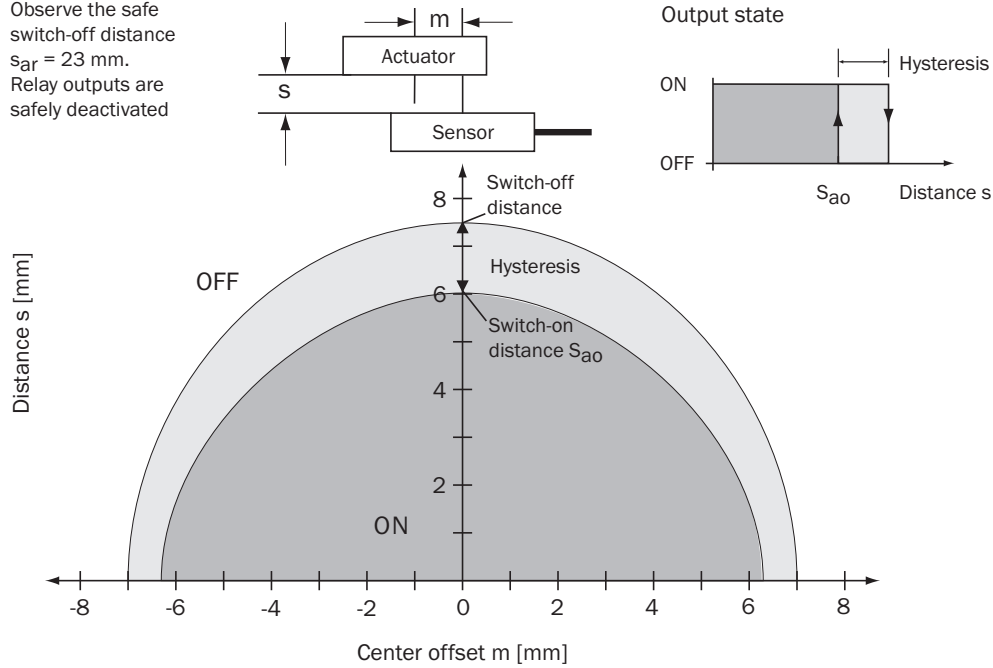
**DDSP:**  
Double Dynamic Safety-Path  
with error monitoring of the actuator,  
of the sensor and of the cable  
to the sensor

- TST Test input (STATE)
- OUT Enable output
- ERR Diagnostic output (ERROR)
- GND 0 V
- H1 / H2 Connection, sensor
- 13 / 14 Connection, N/O contact 1, enable contact safety relay
- 23 / 24 Connection, N/O contact 2, enable contact safety relay

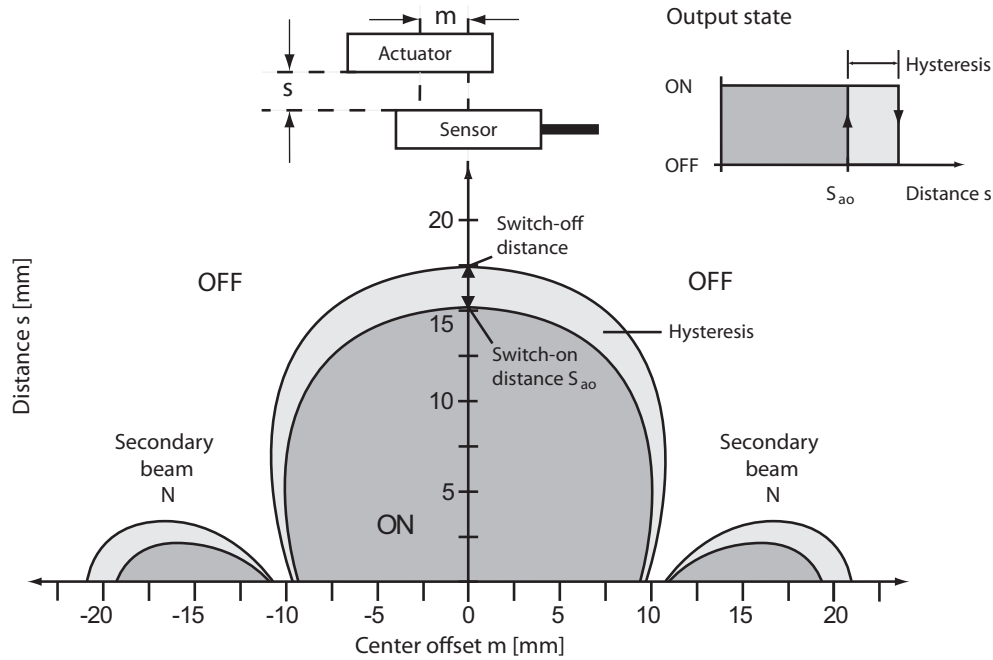
## Response range

### T4000-1RBA01

Observe the safe switch-off distance  $s_{ar} = 23$  mm. Relay outputs are safely deactivated



### T4000-1RBB01




L




## Accessories

### Connecting cables

Figure	Direction of cable outlet	Cable length	Type	Part no.
	Straight	5 m	T4000-DNA05C	6034391
		10 m	T4000-DNA10C	6034392
		20 m	T4000-DNA20C	6021913
		25 m	T4000-DNA25C	6021914
		50 m	T4000-DNA50C	6021915
	Angled	10 m	T4000-DNA10W	6034393
		25 m	T4000-DNA25W	6034394
		50 m	T4000-DNA50W	6034395

### Safety screws

Figure	Packing unit	Type	Part no.
	20	Safety screws T4000	5309170





- Connection of multiple sensors to one evaluation unit
- High protection against manipulation through individually coded actuator
- Small compact design of sensor and actuator
- Sensor and actuator with IP 67 enclosure rating



## Technical data overview

Sensor principle	Transponder
Safety integrity level	SILCL3 (EN 62061)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of non-contact safety switches from ... to (depending on type)	1 ... 2 / 1 ... 4
Type of output	Relay
Number of safe outputs (N/O)	2
Number of application diagnostic outputs (depending on type)	2 x semiconductor, p-switching / 4 x semiconductor, p-switching

## Product description

The T4000 Multi non-contact safety switch system comprises of the following components:

- 1 to 4 sensors
- 1 to 4 coded actuators (unique copy)
- 1 evaluation unit

The evaluation unit is also equipped with:

- 2 LED status displays
- External device monitoring (EDM)
- Automatic or manual reset/restart

## Ordering information

System part	Connection type	Number of read heads from ... to	Cable length	Type	Part no.
Evaluation unit	-	1 ... 2	-	T4000-1RCA02	6029946
		1 ... 4	-	T4000-1RCA04	6029947
Sensor	Connector	-	- <sup>1)</sup>	T4000-DNAC	6021912
	Cable	-	5 m	T4000-DNA05P	6012144
			10 m	T4000-DNA10P	6012145
			15 m	T4000-DNA15P	6012146
Actuator	-	-	-	T4000-1KBA	5306531

<sup>1)</sup> Connecting cable not supplied with delivery

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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### Evaluation unit

Type	T4000-1RCA02	T4000-1RCA04
Safety related parameters <sup>1)</sup>		
Safety integrity level	SILCL3 (EN 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	1.5 x 10 <sup>-8</sup> , with < 23.000 switching cycles p.a. 9.6 x 10 <sup>-8</sup> , with < 180.000 switching cycles p.a.	
T <sub>M</sub> (Mission Time)	20 years, with < 23.000 switching cycles p.a. 2 years, with < 180.000 switching cycles p.a.	
Classification in compliance with IEC/EN 60947-5-3	PDF-M	
Classification according to cULus	Class 2	
Note on operating voltage	Operation with UL-class 2 power supply only	
External fuse	At supply voltage 0.4 A ... 8 A	
Maximum switching voltage	60 V DC/30 V AC	
Housing material	Plastic PA6.6	
Enclosure rating	IP 20	
Mechanical life (relay contacts)	10 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	0 °C ... +55 °C	
Protection class	III	
Contamination rating	2	
Operating voltage	24 V DC (21 V DC ... 27 V DC)	
Number of non-contact safety switches from ... to	1 ... 2	1 ... 4
Rated insulation voltage U <sub>i</sub>	250 V	
Rated impulse withstand voltage U <sub>imp</sub>	4000 V AC	
Type of output	Relay	
Number of safe outputs (N/O)	2	
Number of application diagnostic outputs	2 x semiconductor, p-switching	4 x semiconductor, p-switching
Short-circuit protection	6 A gG	
Usage category in compliance with IEC/EN 60947-5-1	AC-12/DC-12, AC-14/DC-13	
Rated operating current (voltage)	0.3 A (60 V AC) 50 Hz, 6 A (30 V AC) 50 Hz, 0.3 A (60 V DC), 6 A (30 V DC), 1.5 A (230 V AC) 50 Hz, 1.2 A (24 V DC)	
Weight	250 g	
Out indication	✓	
Power indication	✓	
Error indication	✓	
Status display	✓	
Switching delay from state change	290 ms	450 ms
External device monitoring	✓	

<sup>1)</sup> With maximum switch load

### Sensor

Type	T4000-DNAC	T4000-DNA05P	T4000-DNA10P	T4000-DNA15P
Sensor principle	Transponder			
Housing material	Fortron, glass-fiber reinforced thermoplastic			
Enclosure rating	IP 67			
Ambient operating temperature from ... to	-25 °C ... +70 °C			
Connection type	Connector	Cable		
Cable length	-	5 m	10 m	15 m
Maximum cable length	Max. 50 m			
Cable material	-	PVC		
Size of the cable gland	M8	-		
Weight	0.12 kg	0.25 kg	0.39 kg	0.53 kg
Safe switch on distance $S_{ao}$	5 mm <sup>1)</sup> , 10 mm <sup>2)</sup>			
Safe switch off distance $S_{ar}$	23 mm <sup>1)</sup> , 32 mm <sup>2)</sup>			
Monitoring time minimum dwell time	0.5 s			

<sup>1)</sup> With evaluation unit T4000-1RBA01

<sup>2)</sup> With evaluation units T4000-1RCA02, T4000-1RCA04

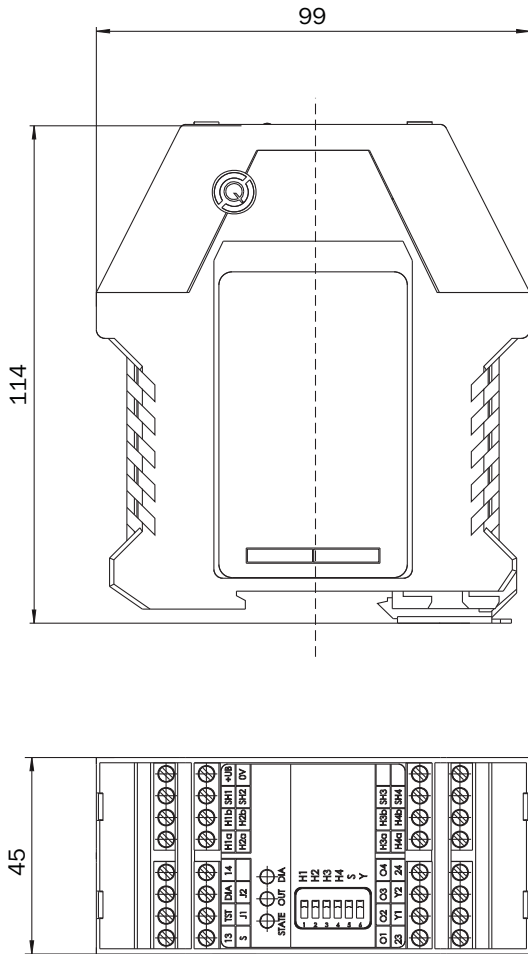
### Actuator

Housing material	Fortron, glass-fiber reinforced thermoplastic
Enclosure rating	IP 67
Ambient operating temperature from ... to	-25 °C ... +70 °C
Weight	30 g
Monitoring time minimum dwell time	0.5 s

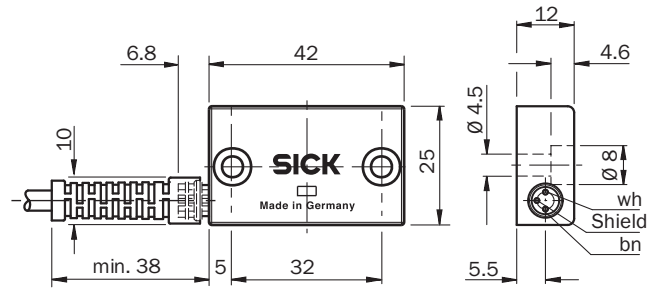


## Dimensional drawings

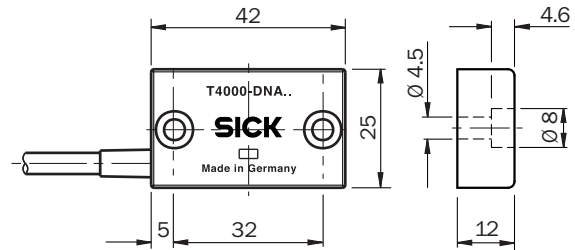
### Evaluation unit



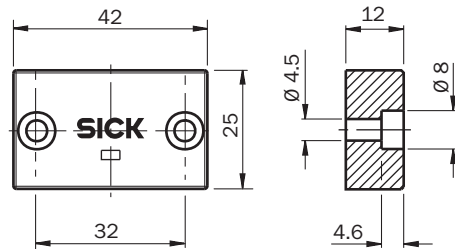
### Sensor connector



### Sensor cable



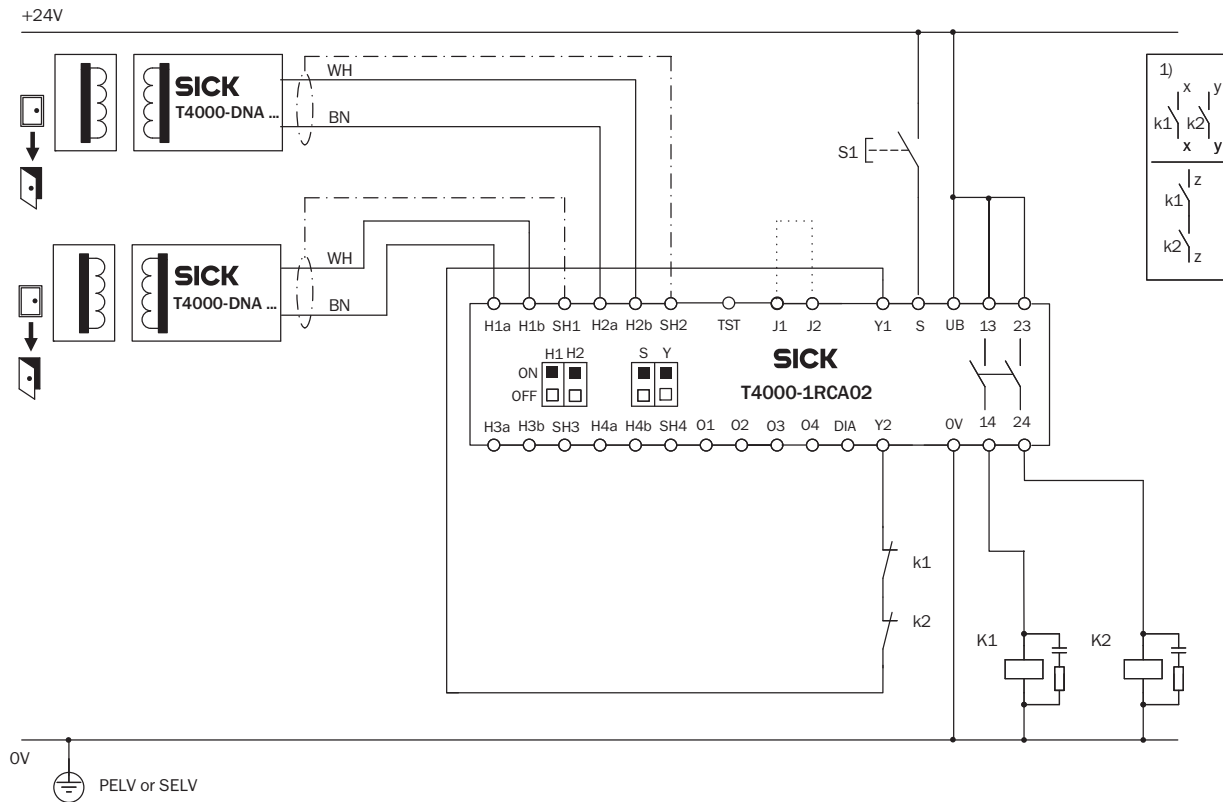
### Actuator



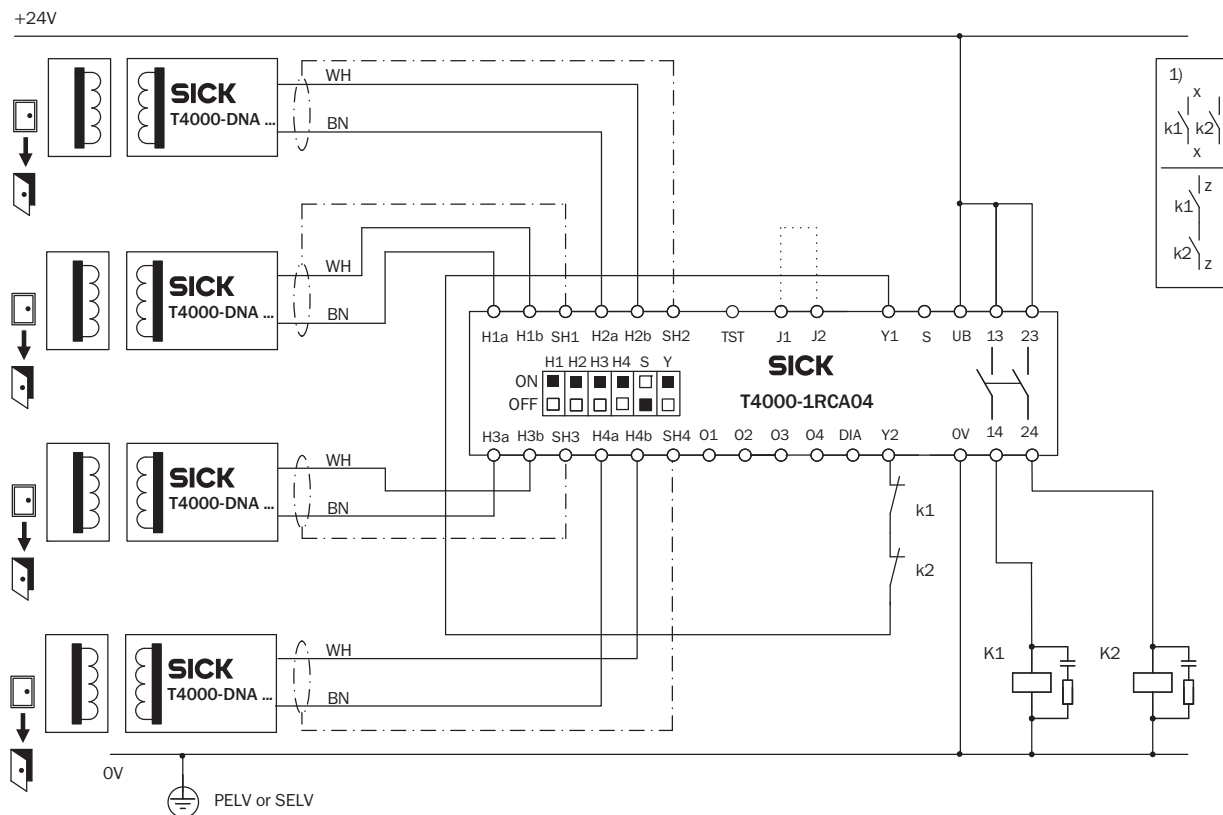
Dimensions in mm

## Connection diagrams

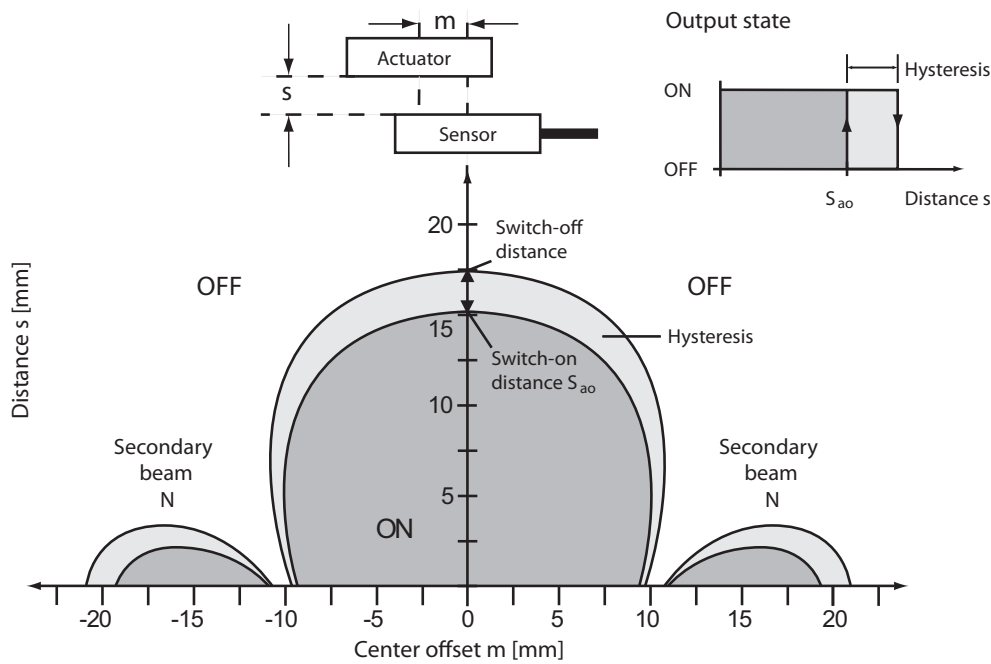
### T4000-1RCA02



### T4000-1RCA04



## Response range



## Accessories

### Connecting cables

Figure	Direction of cable outlet	Cable length	Type	Part no.
	Straight	5 m	T4000-DNA05C	6034391
		10 m	T4000-DNA10C	6034392
		20 m	T4000-DNA20C	6021913
		25 m	T4000-DNA25C	6021914
		50 m	T4000-DNA50C	6021915
	Angled	10 m	T4000-DNA10W	6034393
		25 m	T4000-DNA25W	6034394
		50 m	T4000-DNA50W	6034395

### Safety screws

Figure	Packing unit	Type	Part no.
	20	Safety screws T4000	5309170



- High protection against manipulation through individually coded actuator
- Sensor response range up to 20 mm
- Compact design of the actuator
- Sensor with integrated evaluation unit
- Sensor with LED status display – directly on the protective device
- Sensor with integrated evaluation unit and actuator with IP 67 enclosure rating



## Technical data overview

Sensor principle	Transponder
Safety integrity level	SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of non-contact safety switches	1
Type of output	Semiconductor, p-switching
Number of safe outputs	2

## Product description

The T4000 Compact non-contact safety switch system comprises of the following components:

- 1 sensor with integrated evaluation unit and
- 1 coded actuator

The sensor with integrated evaluation unit is further equipped with:

- 1 solid-state application diagnostic output
- 2 LED status displays

## Ordering information

System part	Type	Part no.
Evaluation unit & sensor	T4000-2DRNAC <sup>1)</sup>	6022052
Actuator	T4000-1KBA	5306531
	T4000-1KBQ	5311153
	T4000-1KBR	5320820

<sup>1)</sup> Connecting cable not supplied with delivery

Further information	Page
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→ Systematic safety	A-0
→ Services	B-0



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### Evaluation unit & sensor

Sensor principle	Transponder
Safety related parameters	
Safety integrity level	SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$2.5 \times 10^{-8}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Classification in compliance with IEC/EN 60947-5-3	PDF-M
Classification according to cULus	Class 2
Note on operating voltage	Operation with UL-class 2 power supply only
External fuse	At supply voltage 0.25 A ... 8 A
Maximum switching voltage	24 V DC
Housing material	Plastic PTB V0 GF30
Enclosure rating	IP 67
Ambient operating temperature from ... to	-20 °C ... +55 °C
Protection class	III
Contamination rating	2
Shock resistance	30 g, 11 ms (IEC 60068-2-27)
Vibration resistance	10 Hz ... 55 Hz, 0.5 mm (IEC 60068-2-6)
Operating voltage	18 V DC ... 27 V DC
Number of non-contact safety switches	1
Maximum cable length	Max. 300 m
Size of the cable gland	M12
Rated insulation voltage U <sub>i</sub>	75 V
Rated impulse withstand voltage U <sub>imp</sub>	1500 V AC
Type of output	Semiconductor, p-switching
Number of safe outputs	2
Usage category in compliance with IEC/EN 60947-5-2	DC-13
Rated operating current (voltage)	0.4 A (24 V DC)
Weight	0.4 kg
Out indication	✓
Error indication	✓
Status display	✓
Safe switch on distance S <sub>ao</sub>	18 mm <sup>1)</sup> , 18 mm <sup>2)</sup> , 19 mm <sup>3)</sup>
Safe switch off distance S <sub>ar</sub>	40 mm <sup>1)</sup> , 58 mm <sup>2)</sup> , 41 mm <sup>3)</sup>
Monitoring time minimum dwell time	0.5 s
Switching delay from state change	180 ms
Discrepancy time of the safety outputs	Max. 120 ms

<sup>1)</sup> With actuator T4000-1KBA

<sup>2)</sup> With actuator T4000-1KBQ

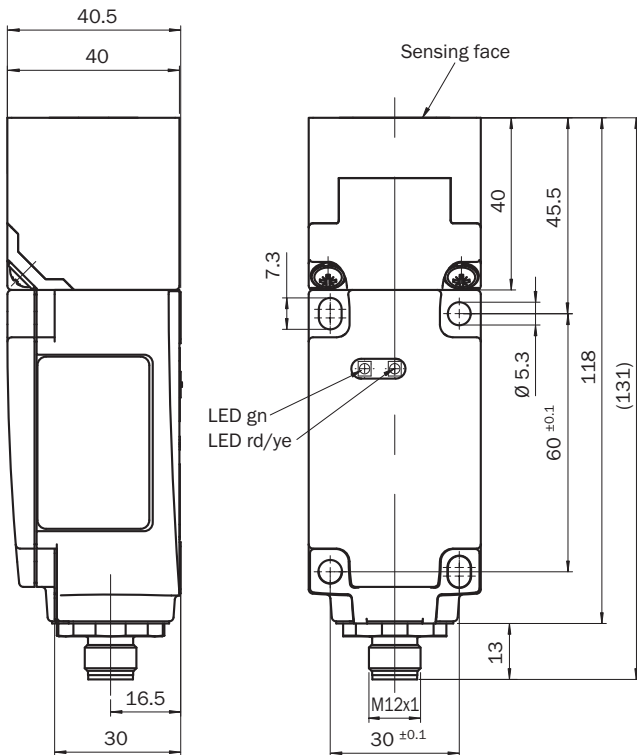
<sup>3)</sup> With actuator T4000-1KBR

### Actuator

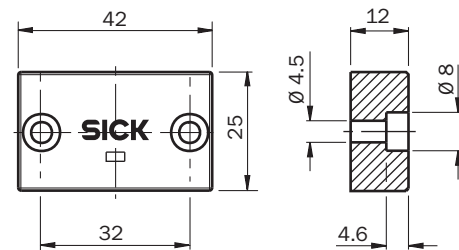
Type	T4000-1KBA	T4000-1KBQ	T4000-1KBR
Housing material	Fortron, glass-fiber reinforced thermoplastic	PBT	PC, polycarbonate
Enclosure rating	IP 67		
Ambient operating temperature from ... to	-25 °C ... +70 °C		
Weight	30 g	70 g	8 g
Monitoring time minimum dwell time	0.5 s		

## Dimensional drawings

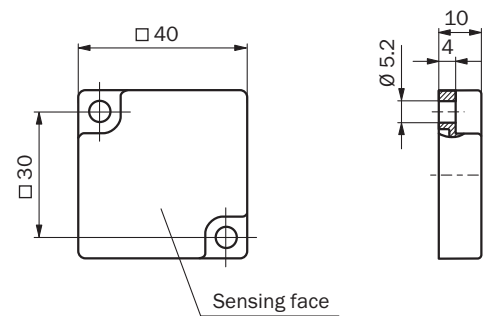
### Evaluation unit & sensor



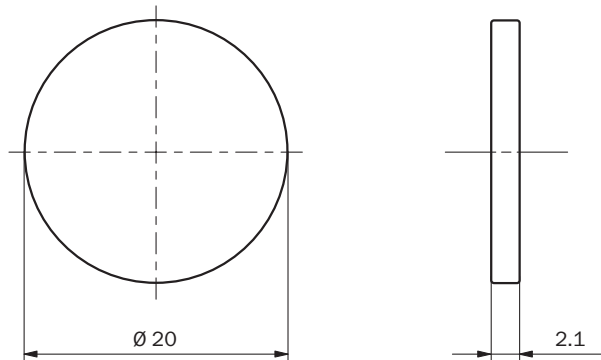
### Actuator T4000-1KBA



### Actuator T4000-1KBQ

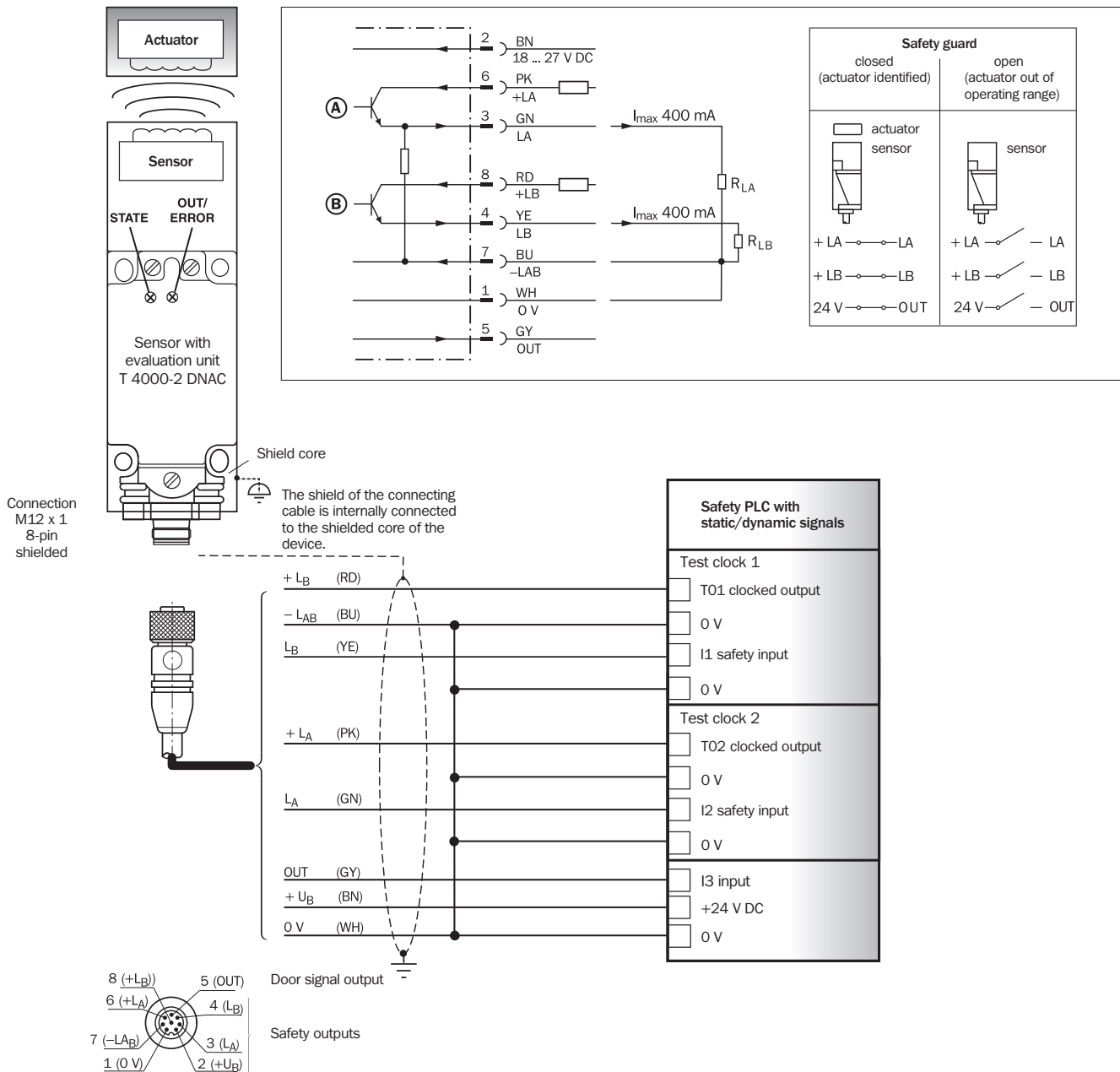


### Actuator T4000-1KBR



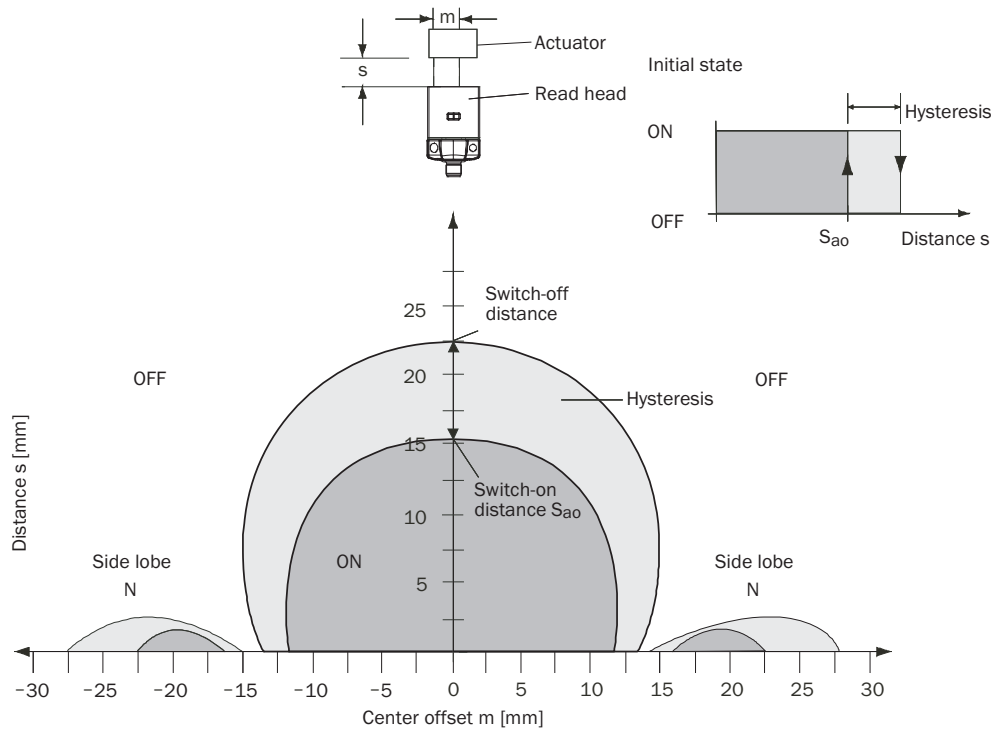
Dimensions in mm

# Connection diagrams



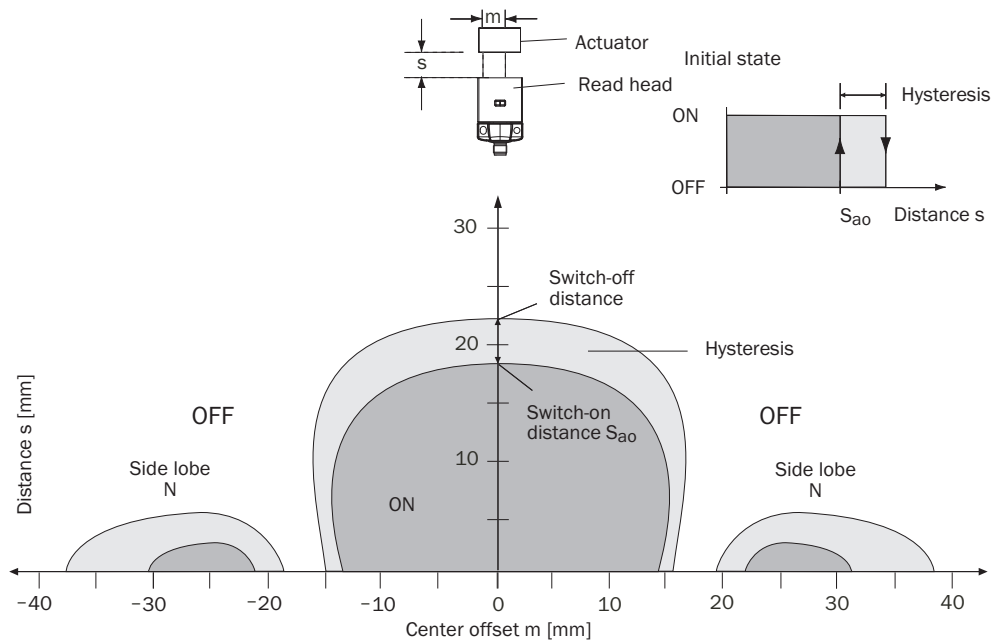
## Response range

### Actuator T4000-1KBA



To avoid entering the response range of the side lobes in the case of approach from the side, a minimum distance of  $s = 4$  mm must be maintained between actuator and safety switch.

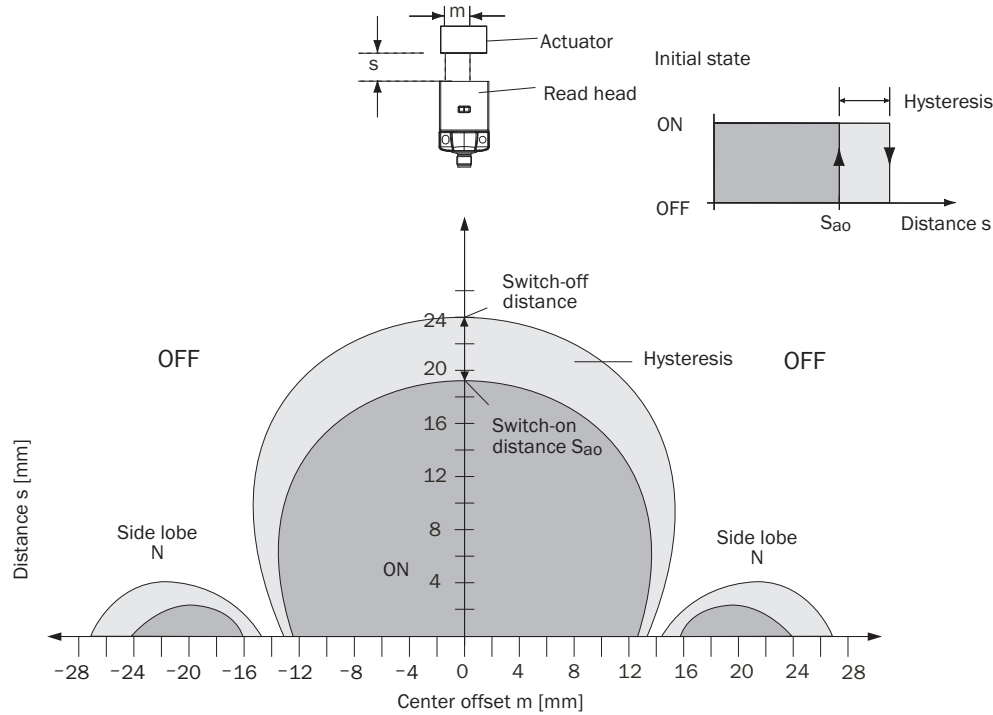
### Actuator T4000-1KBQ



To avoid entering the response range of the side lobes in the case of approach from the side, a minimum distance of  $s = 5$  mm must be maintained between actuator and safety switch.




**Actuator T4000-1KBR**




To avoid entering the response range of the side lobes in the case of approach from the side, a minimum distance of  $s = 5 \text{ mm}$  must be maintained between actuator and safety switch.

## Accessories

### Connecting cables

Figure	Size of the cable gland	Direction of cable outlet	Cable length	Type	Part no.
	M12, 8-pin	Straight	5 m	DOL-1208-G05MA	6020993
			10 m	DOL-1208-G10MA	6022152
			15 m	DOL-1208-G15MA	6022153
			30 m	DOL-1208-G30MA	6022242

### Safety screws

Figure	Packing unit	Type	Part no.
	20	Safety screws T4000	5309170



- High protection against tampering - Unicode and Multicode versions available
- Sensor response range up to 20 mm
- Two safety outputs for direct connection of safety switch to safe control
- Cascading of up to 20 safety switches possible



## Technical data overview

Sensor principle	Transponder
Safety integrity level	SILCL3 (EN 62061)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Type of output	Semiconductor (OSSD)
Number of safe outputs	2

## Product description

The T4000 Direct non-contact safety switch is a transponder safety switch with integrated evaluation unit that is activated by a coded actuator. The release of the safety guard only happens if a valid actuator is within the response range of the T4000 Direct. Two actuation principles are available:

- Multicode: any valid actuator located within the response range of the T4000 Direct
  - Unicode: the code of the actuator in the response range must match the taught code of the T4000 Direct safety switch
- With the two safety outputs (OSSD) of the safety switch, it is possible to directly connect the safety switch to safety evaluation electronics such as a safety programmable logic controller.

## Ordering information

System part	Design	Connection type	Coding	Type	Part no.
Evaluation unit & sensor	-	Connector	Multicode	T40-E0101K	6035041
			Unicode	T40-E0121K	6035042
Actuator	Cuboid	-	-	T4000-1KBA	5306531
	Square	-	-	T4000-1KBQ	5311153
	Round	-	-	T4000-1KBR	5320820

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→ Connection diagrams	L-45
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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### Evaluation unit & sensor

Type	T40-E0101K	T40-E0121K
Sensor principle	Transponder	
Coding	Multicode	Unicode
Safety related parameters		
Safety integrity level	SILCL3 (EN 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$2.1 \times 10^{-9}$ (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Classification in compliance with IEC/EN 60947-5-3	PDF-M	
Classification according to cULus	Class 2	
Note on operating voltage	Operation with UL-class 2 power supply only	
External fuse	At supply voltage 0.25 A ... 4 A	
Housing material	Plastic PTB VO GF30	
Enclosure rating	IP 67	
Ambient operating temperature from ... to	-20 °C ... +55 °C	
Protection class	III	
Operating voltage	24 V DC (20.4 V DC ... 27.6 V DC)	
Connection type	Connector	
Maximum cable length	Max. 200 m	
Size of the cable gland	M12	
Rated insulation voltage U <sub>i</sub>	75 V	
Rated impulse withstand voltage U <sub>imp</sub>	1500 V AC	
Type of output	Semiconductor (OSSD)	
Number of safe outputs	2	
Usage category in compliance with IEC/EN 60947-5-2	DC-13	
Rated operating current (voltage)	0.4 A (24 V DC)	
Weight	0.4 kg	
Power indication	-	
Error indication	✓	
Status display	✓	
Safe switch on distance S <sub>ao</sub>	15 mm <sup>1)</sup> , 18 mm <sup>2)</sup> , 19 mm <sup>3)</sup>	
Safe switch off distance S <sub>ar</sub>	45 mm <sup>1)</sup> , 55 mm <sup>2)</sup> , 55 mm <sup>3)</sup>	
Monitoring time minimum dwell time	0.5 s	
Switching delay from state change	290 ms	
Discrepancy time of the safety outputs	Max. 10 ms	

<sup>1)</sup> With actuator T4000-1KBA

<sup>2)</sup> With actuator T4000-1KBQ

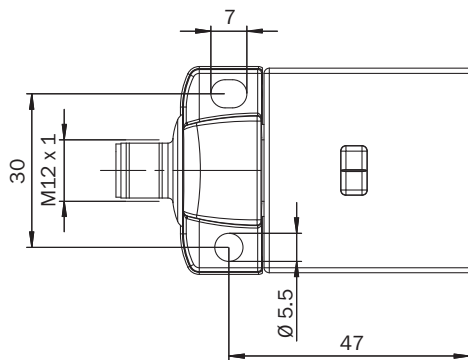
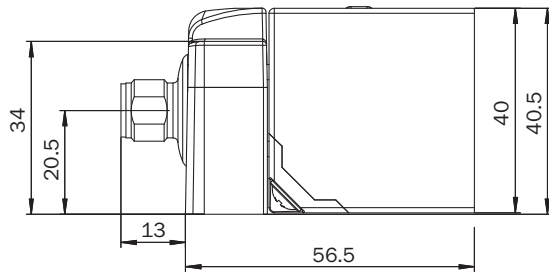
<sup>3)</sup> With actuator T4000-1KBR

### Actuator

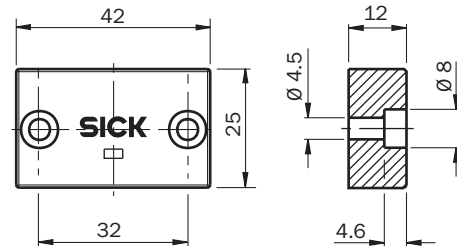
Type	T4000-1KBA	T4000-1KBQ	T4000-1KBR
Housing material	Fortron, glass-fiber reinforced thermoplastic	PBT	PC, polycarbonate
Enclosure rating	IP 67		
Ambient operating temperature from ... to	-25 °C ... +70 °C		
Weight	30 g	70 g	8 g
Monitoring time minimum dwell time	0.5 s		

## Dimensional drawings

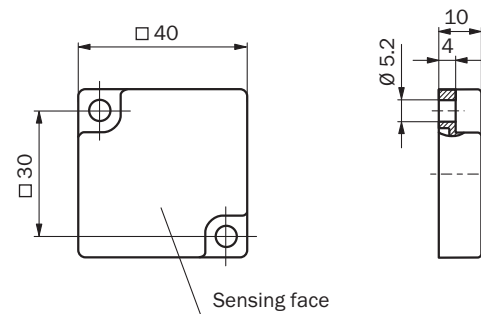
### Evaluation unit & sensor



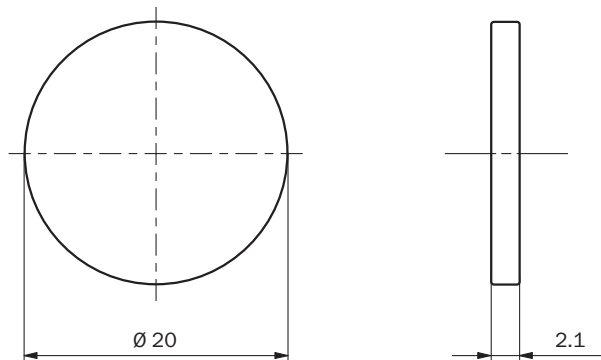
### Actuator T4000-1KBA



### Actuator T4000-1KBQ



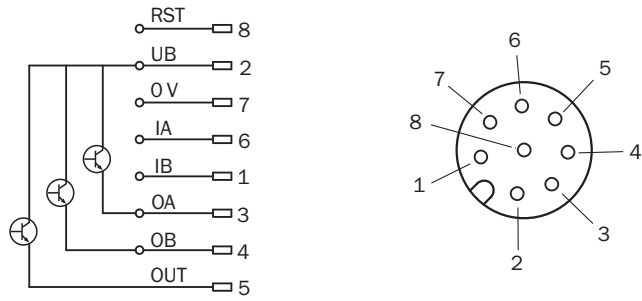
### Actuator T4000-1KBR



Dimensions in mm



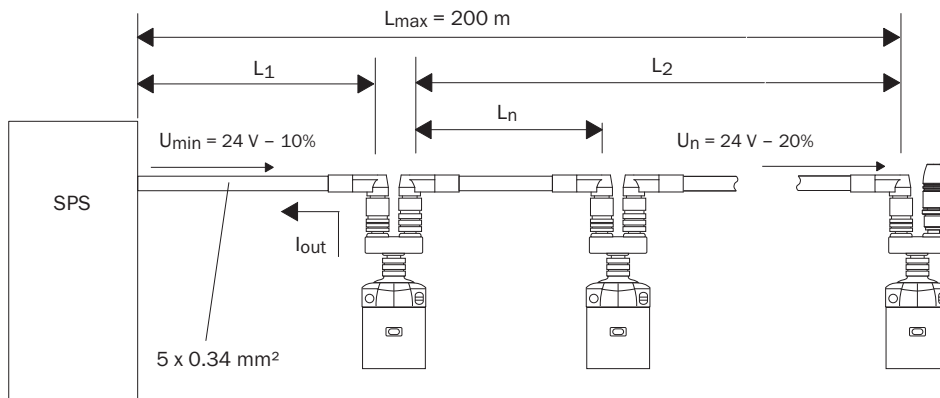
## Internal circuitry



## Connection diagrams

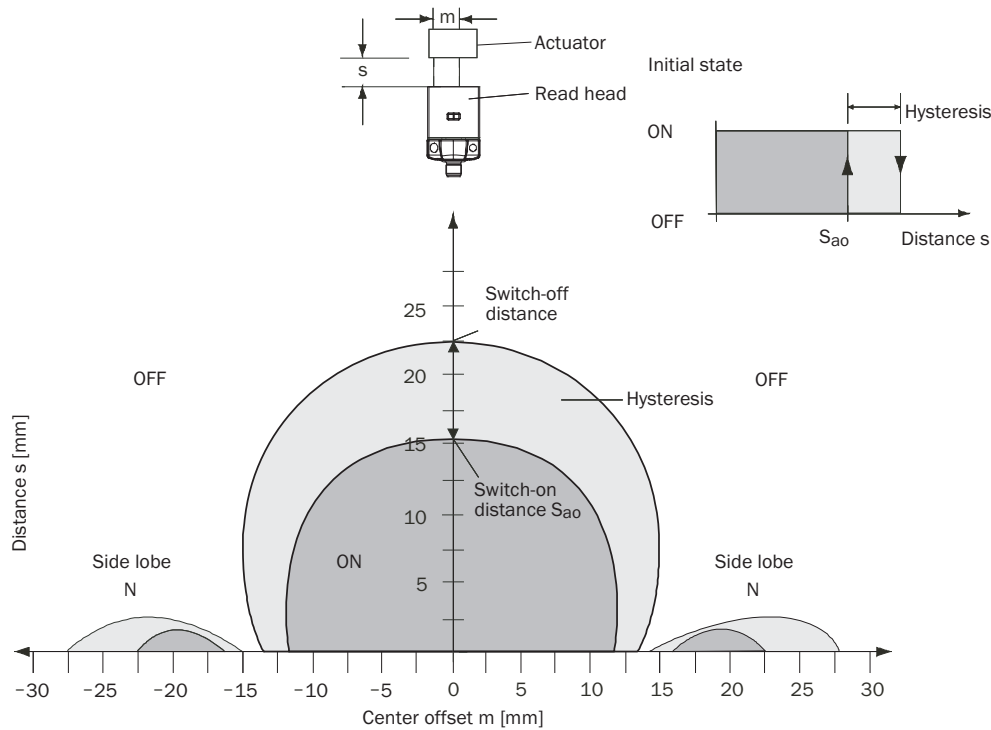
→ You can find connection diagrams at [www.mysick.com](http://www.mysick.com)

## Serial connection of up to 20 sensors



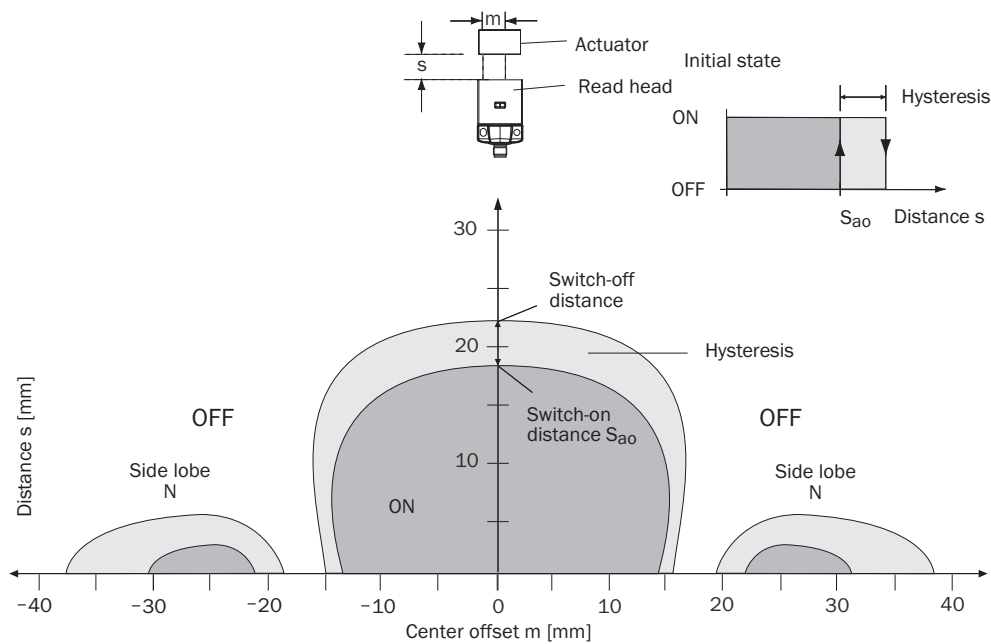
## Response range

### Actuator T4000-1KBA



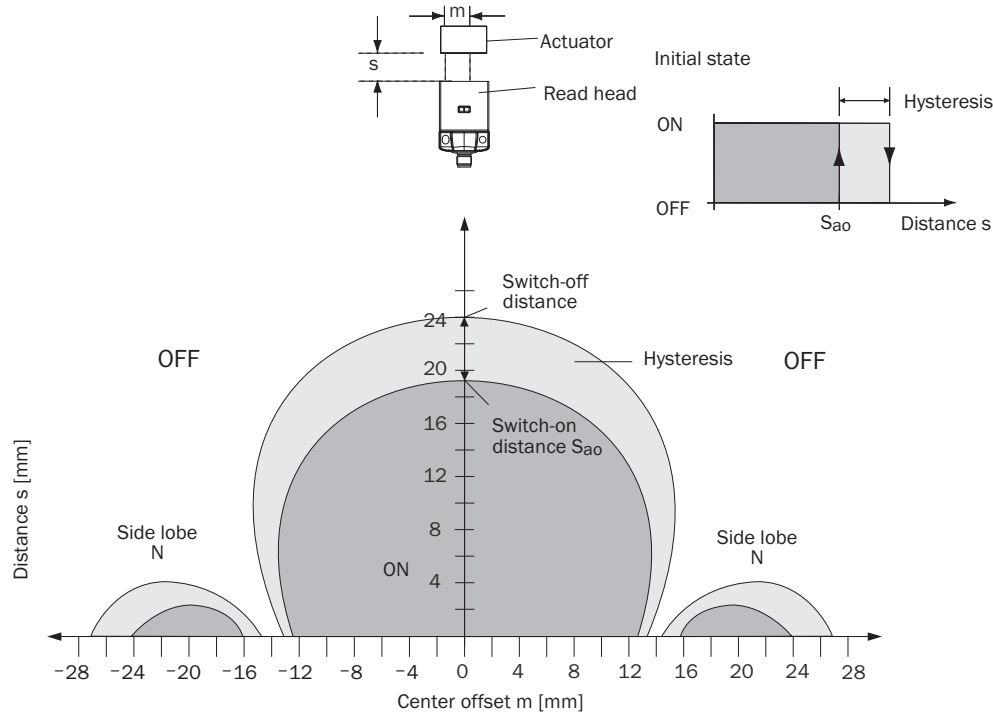
To avoid entering the response range of the side lobes in the case of approach from the side, a minimum distance of  $s = 4$  mm must be maintained between actuator and safety switch.

### Actuator T4000-1KBQ



To avoid entering the response range of the side lobes in the case of approach from the side, a minimum distance of  $s = 5$  mm must be maintained between actuator and safety switch.

**Actuator T4000-1KBR**



To avoid entering the response range of the side lobes in the case of approach from the side, a minimum distance of  $s = 5$  mm must be maintained between actuator and safety switch.

## Accessories

### Connecting cables

Figure	Size of the cable gland	Direction of cable outlet	Cable length	Type	Part no.
	M12, 8-pin	Straight	5 m	DOL-1208-G05MA	6020993
			10 m	DOL-1208-G10MA	6022152
			15 m	DOL-1208-G15MA	6022153
			30 m	DOL-1208-G30MA	6022242

### Connector

Figure	Usage	Type	Part no.
	End plug for serial connection in combination with T-junction T40-A2191N	T40-A3191N	6035521

### T-junction

Figure	Description	Type	Part no.
	T-junction for serial connection of T4000 Direct	T40-A2191N	6035520

### Safety screws

Figure	Packing unit	Type	Part no.
	20	Safety screws T4000	5309170



- No actuator necessary
- Sensor with LED status display
- Safe cascading of the sensors possible
- Direct connection of the sensors to safe PLC
- Connection of up to 9 sensors to one evaluation unit



## Technical data overview

Sensor principle	Inductive
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Type of output	Semiconductor, pulsed
Number of safe outputs	1

## Product description

The IN4000 Standard non-contact safety switch is an inductive sensor that is activated by metal (e.g., steel ST37). It does not, therefore, require a separate coded actuator.

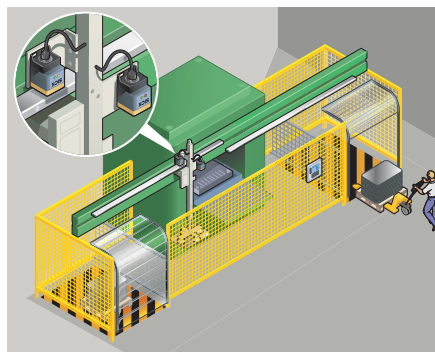
Due to the non-contact form of operation, this sensor has advantages in that it is

straightforward to adjust and install. It also has increased resistance to shock and vibration.

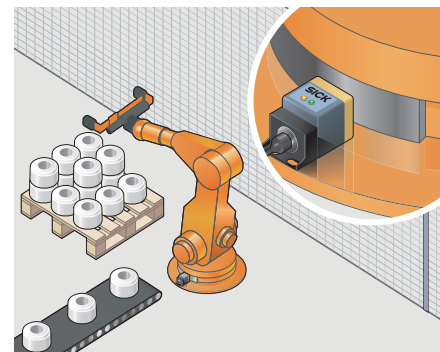
The response range of the sensor is monitored spatially and over time. In this way, increased protection against tampering is provided.

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)



Safe position monitoring on a gantry robot



Safe axis monitoring of a robot

## Ordering information

System part	Design	Housing diameter	Connection type	Type	Part no.
Sensor	Cuboid	-	Connector	IN40-D0101K	6027389
		M30	Connector	IN40-D0202K	6027392
	Cylindrical	M18	Connector	IN40-D0303K	6027391
				IN40-D0304K	6037684

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→ Internal circuitry	L-50
→ Response range	L-51
→ Accessories	L-51
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

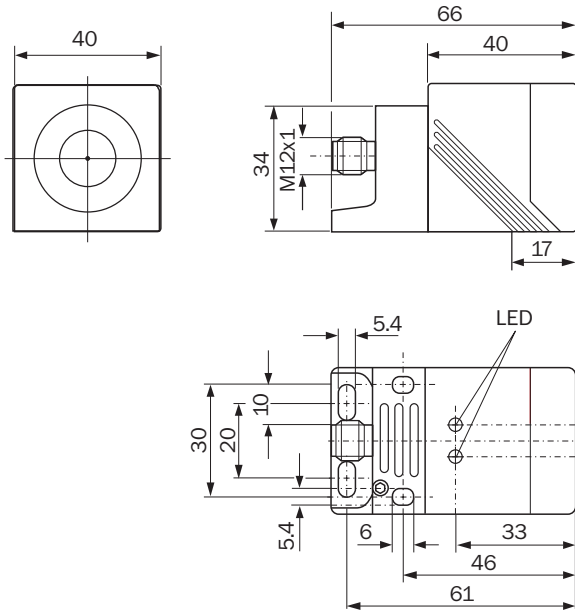
Type	IN40-D0101K	IN40-D0202K	IN40-D0303K	IN40-D0304K
Sensor principle	Inductive			
Safety related parameters				
Safety integrity level	SIL3 (IEC 61508)			
Category	Category 4 (EN ISO 13849)			
Performance level	PL e (EN ISO 13849)			
PFHd (mean probability of a dangerous failure per hour)	1.33 x 10 <sup>-9</sup> (EN ISO 13849)			
T <sub>M</sub> (Mission Time)	10 years (EN ISO 13849)			
Classification in compliance with IEC/EN 60947-5-3	PDF-M			
Housing material	PPE/die-cast zinc	PEEK/V4A	PBT/V4A	PBT/specially coated brass
Enclosure rating	IP 67	IP 69K		
Ambient operating temperature from ... to	-25 °C ... +70 °C	0 °C ... +70 °C	-25 °C ... +70 °C	
Protection class	III			
Shock resistance	30 g, 11 ms (according to EN 60947-5-3)			
Vibration resistance	10 Hz ... 55 Hz, 1 mm (according to EN 60947-5-3)			
Operating voltage	24 V DC (19.2 V DC ... 30 V DC)			
Connection type	Connector			
Size of the cable gland	M12			
Type of output	Semiconductor, pulsed			
Number of safe outputs	1			
Weight	0.22 kg	0.13 kg	0.06 kg	
Power indication	✓			
Status display	✓			
Safe switch on distance S <sub>ao</sub> from ... to	10 mm ... 15 mm <sup>1)</sup>	6 mm ... 12 mm <sup>1)</sup>	3 mm ... 6 mm <sup>1)</sup>	1 mm ... 4 mm <sup>1)</sup>
Safe switch off distance S <sub>ar</sub>	30 mm <sup>1)</sup>		15 mm <sup>1)</sup>	10 mm <sup>1)</sup>
Monitoring time minimum dwell time	0.2 s			
Switching delay from state change	T <sub>2</sub> + 20 ms <sup>2)</sup>			

<sup>1)</sup> Dependent on material. The indicated values refer to steel ST37.

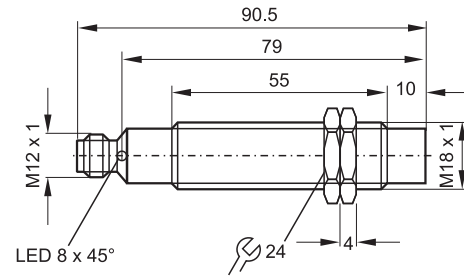
<sup>2)</sup> During this time the output is switched off (logical "0"), see response range

## Dimensional drawings

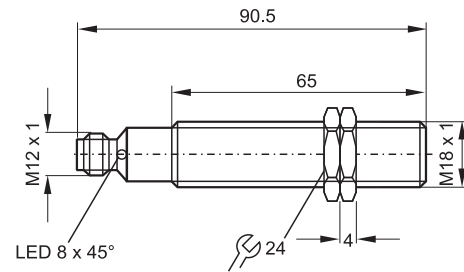
IN40-D0101K



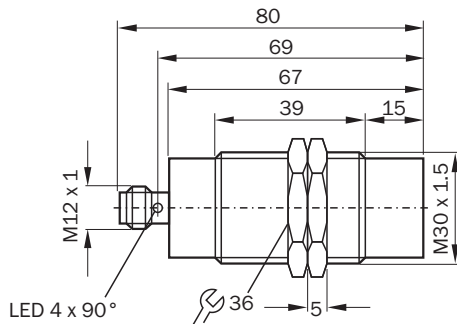
IN40-D0303K



IN40-D0304K



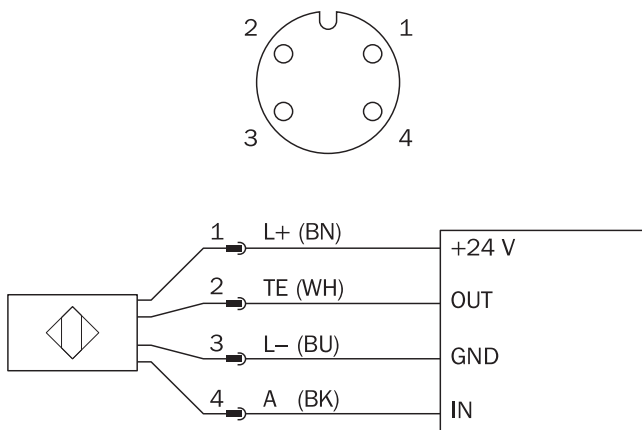
IN40-D0202K



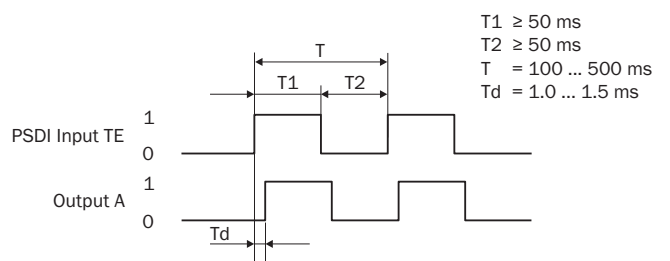
Dimensions in mm

## Internal circuitry

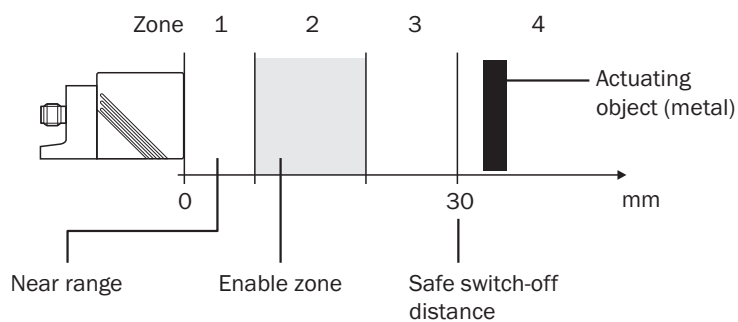
### Sensor connections



### Sensor timing




## Response range




## Accessories

### Connectors

Figure	Size of the cable gland	Direction of cable outlet	Cable length	Type	Part no.
	M12, 4-pin	Straight	5 m	DOL-1204-G05M	6009866
			10 m	DOL-1204-G10M	6010543
			15 m	DOL-1204-G15M	6010753

### T-junction

Figure	Description	Type	Part no.
	T-junction for serial connection of IN4000 sensors	IN40-A2121N	5315025





- No actuator necessary
- Inductive safety switch with LED status display
- Inductive safety switch with integrated evaluation unit
- Two safety outputs for direct connection of safety switch to safe control



## Technical data overview

Sensor principle	Inductive
Safety integrity level	SIL3 (IEC 61508) SILCL3 (EN 62061)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Type of output	Semiconductor (OSSD)
Number of safe outputs	2

## Product description

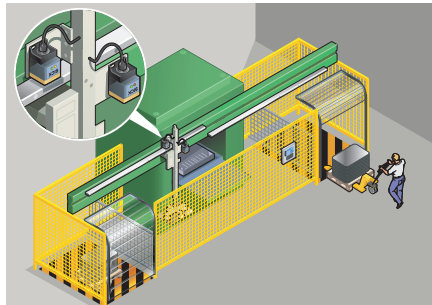
The IN4000 non-contact safety switch Direct is an inductive safety switch with integrated evaluation unit that is activated by metal (e.g., steel ST37). Therefore, it does not require a separate coded actuator. Due to the non-contact form of operation, this sensor has advantages in that it is straightforward to adjust and install. It also has increased resistance to shock and

vibration. The response range of the sensor is monitored spatially and over time. In this way, increased protection against tampering is provided.

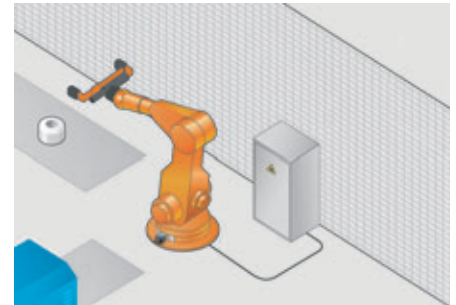
With the two safety outputs (OSSD) of the safety switch, it is possible to directly connect the safety switch to safety evaluation electronics such as a safety programmable logic controller.

## Applications

→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)



Safe position monitoring on a gantry robot



Safe axis monitoring of a robot

## Ordering information

System part	Design	Connection type	Type	Part no.
Evaluation unit & sensor	Cuboid	Connector	IN40-E0101K	6027388

Further information	Page
→ Dimensional drawings	L-54
→ Internal circuitry	L-54
→ Response range	L-54
→ Accessories	L-55
→ Systematic safety	A-0
→ Services	B-0



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

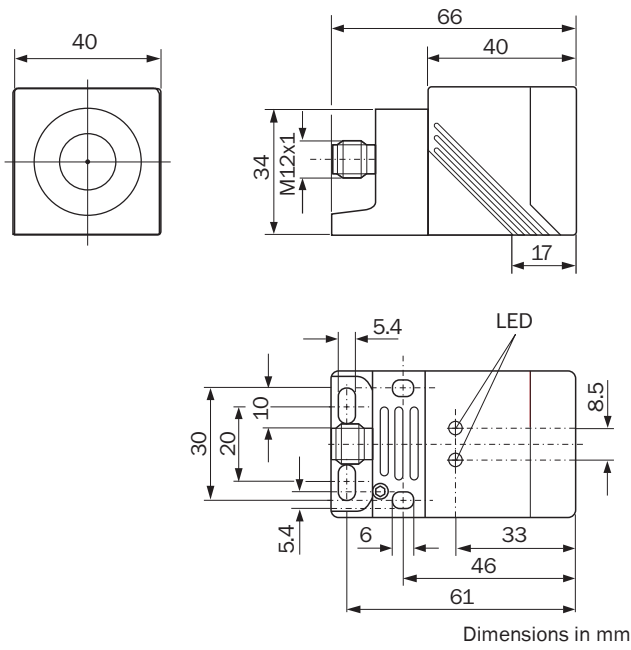
<b>Safety related parameters</b>	
<b>Safety integrity level</b>	SIL3 (IEC 61508) SILCL3 (EN 62061)
<b>Category</b>	Category 4 (EN ISO 13849)
<b>Performance level</b>	PL e (EN ISO 13849)
<b>PFHd (mean probability of a dangerous failure per hour)</b>	$2.5 \times 10^{-9}$ (EN ISO 13849)
<b>T<sub>M</sub> (Mission Time)</b>	10 years (EN ISO 13849)
<b>Classification in compliance with IEC/EN 60947-5-3</b>	PDF-M
<b>Housing material</b>	PPE/die-cast zinc
<b>Enclosure rating</b>	IP 67
<b>Ambient operating temperature from ... to</b>	-25 °C ... +70 °C
<b>Protection class</b>	III
<b>Shock resistance</b>	30 g, 11 ms (according to EN 60947-5-3)
<b>Vibration resistance</b>	10 Hz ... 55 Hz, 1 mm (according to EN 60947-5-3)
<b>Operating voltage</b>	24 V DC (19.2 V DC ... 30 V DC)
<b>Connection type</b>	Connector
<b>Size of the cable gland</b>	M12
<b>Type of output</b>	Semiconductor (OSSD)
<b>Number of safe outputs</b>	2
<b>Weight</b>	0.22 kg
<b>Power indication</b>	✓
<b>Status display</b>	✓
<b>Safe switch on distance S<sub>ao</sub> from ... to</b>	10 mm ... 15 mm <sup>1)</sup>
<b>Safe switch off distance S<sub>ar</sub></b>	30 mm <sup>1)</sup>
<b>Monitoring time minimum dwell time</b>	0.2 s
<b>Switching delay from state change</b>	Max. 50 ms <sup>2)</sup>

<sup>1)</sup> Dependent on material. The indicated values refer to steel ST37.

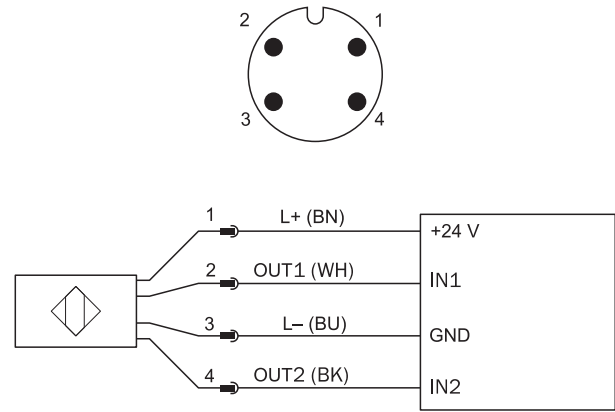
<sup>2)</sup> During this time the output is switched off (logical "0"), see response range



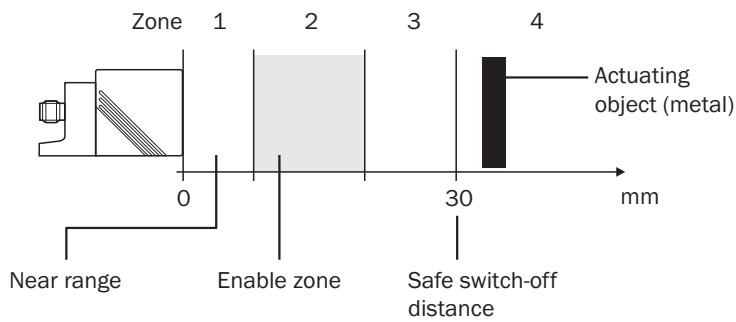
### Dimensional drawings



### Internal circuitry




### Response range



## Accessories

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### Connectors

Figure	Size of the cable gland	Direction of cable outlet	Cable length	Type	Part no.
	M12, 4-pin	Straight	5 m	DOL-1204-G05M	6009866
			10 m	DOL-1204-G10M	6010543
			15 m	DOL-1204-G15M	6010753



## Safety command devices

### Components for effective safety solutions

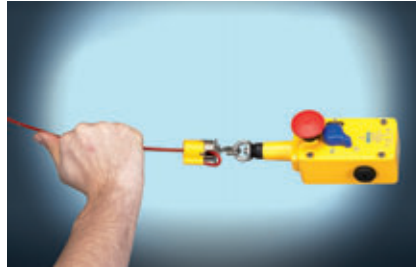
With SICK safety command devices, dangerous movements can be stopped and controlled safely.

- For emergency stop functions, either the ES21 emergency stop pushbuttons or the i110RP or i150RP rope pull switches are used.
- ES21 emergency stop pushbuttons and i110RP and i150RP rope pull switches comply with the relevant standards EN ISO 13850 and 60947-5-5 for emergency stop. They must lock upon actuation and have to be unlocked manually afterwards.



#### Emergency stop pushbuttons

- Emergency stop pushbuttons can either be integrated in a machine control panel or directly on a machine using a surface mount version.



#### Rope pull switches




- Rope pull switches are usually applied on machines that are not protected by safety covers, e.g., conveyors.



#### Enabling switches

- Enabling switches are needed to initiate movements. They are only used in setup mode and protect the person in the hazardous area as the protective devices are usually not activated in this situation.



Safety application	Model	Number of positive action N/C contacts / N/O contacts	Housing material	Connection type <sup>1)</sup>	Cable length/ maximum rope length	Enclosure rating	Product	Page
	Emergency stop pushbutton	1 / 0 1 / 1 2 / 0 2 / 1 3 / 0	Plastic	Cable gland 2 x M20	—	IP 54 IP 65	ES21	M-2
	Rope pull switch	3 / 1 2 / 2	Metal	Cable gland 1 x M20	30 m	IP 66	i110RP	M-10
				Cable gland 3 x M20	75 m	IP 65	i150RP	M-14
	Enabling switch	2 / 2	Plastic	Cable	5 m 10 m 25 m	IP 65 IP 67	E100	M-19

<sup>1)</sup> For emergency stop pushbuttons: connection type housing





- Emergency stop pushbutton in accordance with EN ISO 13850 and EN 60947-5-5
- Visible indication of switching position
- With panel type mounting, safe contacts monitor the correct assembly of the pushbutton with the contact block
- Optional LED illumination or protective collar versions



## Technical data overview

Number of positive action N/C contacts (depending on type)	1 / 2 / 3
Number of N/O contacts (depending on type)	0 / 1
Housing material	Plastic
Enclosure rating (depending on type)	IP 54 / IP 65
Connection type (contacts)	Screw connection
Mounting diameter	22 mm

## Product description

Emergency stop pushbuttons are a must for automated machines and plants. In an emergency, anyone pressing the button immediately puts a machine or plant in a safe state by stopping the hazardous movement.

- Versions for panel and surface mounting
- Release either by turning or by key
- Various switching elements with N/C and N/O combinations

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Applications

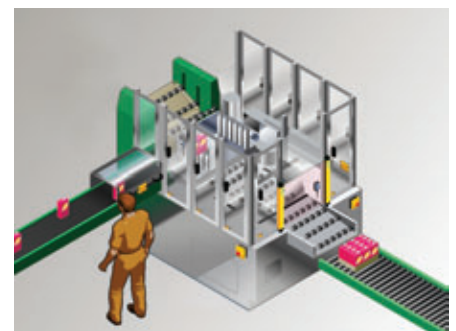
→ You can find more applications using the application finder at [www.mysick.com](http://www.mysick.com)

- Packaging machines
- Processing centers

- Conveyor systems



Panel mount version for integration in a machine control panel



Surface mount version for direct mounting on a machine

Further information	Page
→ Technical specifications	M-5
→ Dimensional drawings	M-6
→ Accessories	M-9
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

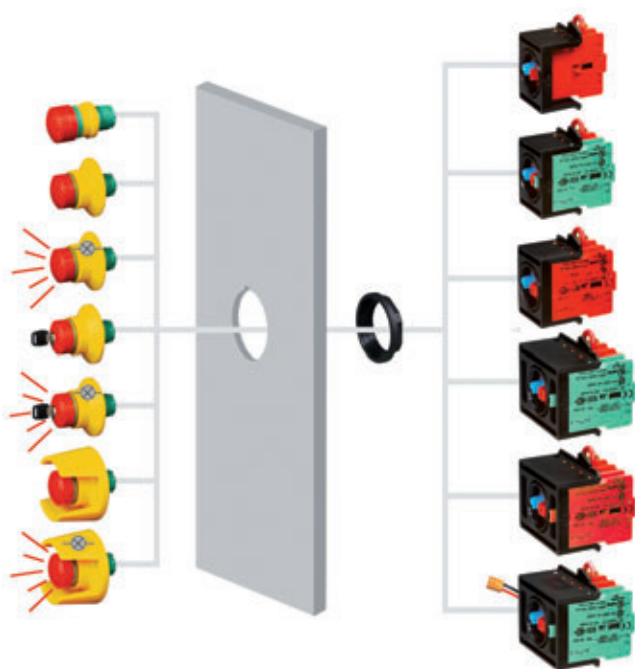
### ES21 emergency stop pushbutton ordering options

#### Panel mount versions:

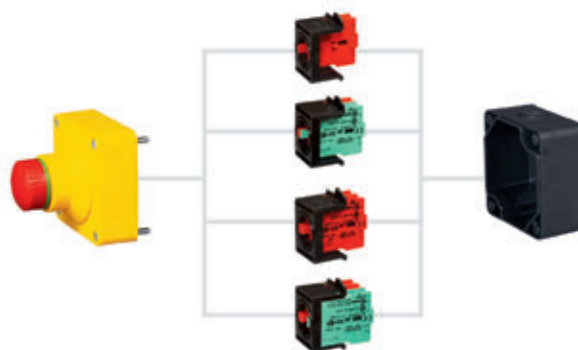
- Pushbuttons and switching elements: individual combinations possible or
- Complete device (pushbutton with switching element)  
Note: Pushbuttons with illumination should be used with switching elements that have illumination connection.

#### Surface mount versions:

- Complete devices, pre-assembled. Can be delivered with different switching elements



Panel mount versions (pushbuttons and switching elements)



Surface mount version (complete device)



Panel mount version (complete device)

## Pushbuttons

Obstruction protection <sup>1)</sup>	Release type	Illumination	Protective collar <sup>2)</sup>	Type	Part no.
-	Rotary release	-	-	ES21-AT1110	5321156
✓	Rotary release	-	-	ES21-AT1120	5321157
		✓	-	ES21-AT1130	5321158
	Key release	-	-	ES21-AK1120	5321163
		✓	-	ES21-AK1130	5321164
	Rotary release	-	✓	ES21-AT1140	5321165
		✓	✓	ES21-AT1150	5321166

<sup>1)</sup> Prevention against obstruction of the emergency stop pushbutton.

<sup>2)</sup> Prevention against unintentional activation of the emergency stop pushbutton (not approved in the U.S. and Canada).

### Switching elements

Mounting version	Number of positive action N/C contacts	Number of N/O contacts	Contact module for panel mount version <sup>1)</sup>	Illumination connection	Type	Part no.
Panel mount version	1	0	✓	-	ES21-CG1001	6036139
		1	✓	-	ES21-CG1101	6036141
	2	0	✓	-	ES21-CG2001	6036140
		1	✓	-	ES21-CH2101	6036144
			✓	ES21-CH2111	6036143	
	3	0	✓	-	ES21-CH3001	6035721

<sup>1)</sup> Additional contact (N/O) monitors the correct assembly of the pushbutton with the switching element.

### Complete devices

- Obstruction protection: ✓
- Release type: Rotary release
- Protective collar: -

Mounting version	Number of positive action N/C contacts	Number of N/O contacts	Contact module for panel mount version <sup>1)</sup>	Illumination	Type	Part no.
Surface mount version	1	0	-	-	ES21-SA10C1	6036145
		1	-	-	ES21-SA10D1	6036146
	2	0	-	-	ES21-SA10E1	6036147
		1	-	-	ES21-SA10F1	6036148
			✓	ES21-SA11H1	6036751	
Panel mount version	2	1	✓	-	ES21-SB10G1	6036492

<sup>1)</sup> Additional contact (N/O) monitors the correct assembly of the pushbutton with the switching element.





## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### Pushbuttons

Illumination	Without illumination	With illumination
Housing material	Plastic	
Enclosure rating	IP 65	IP 54
Mechanical life	50.000 switching cycles	
Ambient operating temperature from ... to	-30 °C ... +70 °C	-30 °C ... +55 °C
Mounting diameter	22 mm	

### Switching elements

Illumination connection	Without illumination connection	With illumination connection
Protection class	II	
Safety related parameters		
<b>B<sub>10d</sub> parameter</b>	4.75 x 10 <sup>6</sup> switching cycles	
Mechanical life	1 x 10 <sup>6</sup> switching cycles	
Electrical life (depending on the load)	1 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	-30 °C ... +85 °C	
Switching principle	Slow action switching element	
Number of positive action N/C contacts (depending on type)	1 / 2 / 3	2
Number of N/O contacts (depending on type)	0 / 1	1
Contact module for panel mount version	✓	
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13	
Rated operating current (voltage)	3 A (250 V AC), 2 A (24 V DC)	
Rated current (voltage) according to EN 61058-1	16 A (10 A) 250 V AC 10 A (6 A) 440 V AC	
Rated insulation voltage U <sub>i</sub>	600 V	
Minimum switching voltage	5 V DC	
Minimum switching current	1 mA	
Connection type (contacts)	Screw connection	
Maximum connection cable cross-section	2.5 mm <sup>2</sup>	
Illumination		
Supply voltage	-	24 V DC (12 V DC ... 30 V DC)
Operating current	-	8 mA ... 44 mA
Life time	-	70.000 h <sup>1)</sup> , 100.000 h <sup>2)</sup>

<sup>1)</sup> At 55 °C, 20 mA

<sup>2)</sup> At 25 °C, 20 mA



### Complete devices

Mounting version	Surface mount version		Panel mount version
Illumination	✓	-	-
Housing material	Plastic		
Enclosure rating	IP 54	IP 65	IP 65
Protection class	II		
Safety related parameters			
<b>B<sub>10d</sub> parameter</b>	2.5 x 10 <sup>5</sup> switching cycles		
Electrical life (depending on the load)	1 x 10 <sup>6</sup> switching cycles		
Ambient operating temperature from ... to	-25 °C ... +55 °C	-25 °C ... +60 °C	-30 °C ... +70 °C
Switching principle	Slow action switching element		
Number of positive action N/C contacts (depending on type)	2	1 / 2	2
Number of N/O contacts (depending on type)	1	0 / 1	1
Contact module for panel mount version	-		✓
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13		
Rated operating current (voltage)	3 A (250 V AC), 2 A (24 V DC)		
Rated current (voltage) according to EN 61058-1	16 A (10 A) 250 V AC 10 A (6 A) 440 V AC		
Rated insulation voltage U <sub>i</sub>	600 V		
Minimum switching voltage	5 V DC		
Minimum switching current	1 mA		
Connection type	Cable gland		-
Number of cable glands x size of the screwed joint	2 x M20		-
Connection type (contacts)	Screw connection		
Maximum connection cable cross-section	2.5 mm <sup>2</sup>		
Illumination			
<b>Supply voltage</b>	24 V DC (12 V DC ... 30 V DC)	-	-
<b>Operating current</b>	8 mA ... 44 mA	-	-
<b>Life time</b>	70.000 h <sup>1)</sup> , 100.000 h <sup>2)</sup>	-	-

<sup>1)</sup> At 55 °C, 20 mA

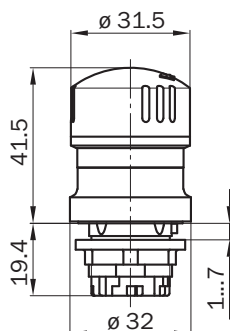
<sup>2)</sup> At 25 °C, 20 mA

## Dimensional drawings

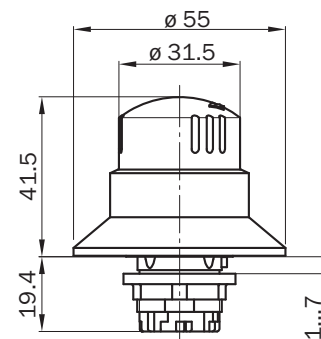


### Pushbuttons

**ES21-AT1110**

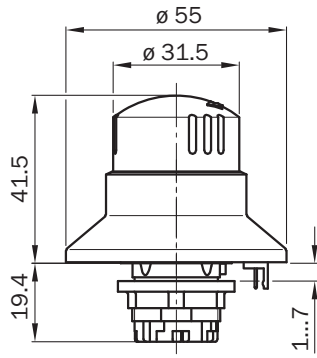


**ES21-AT1120**

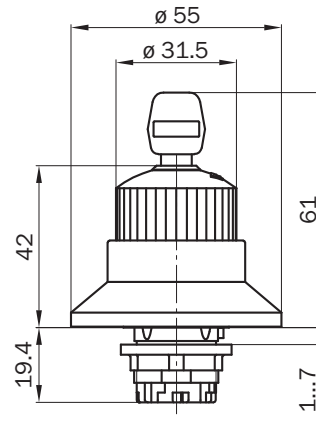


Dimensions in mm

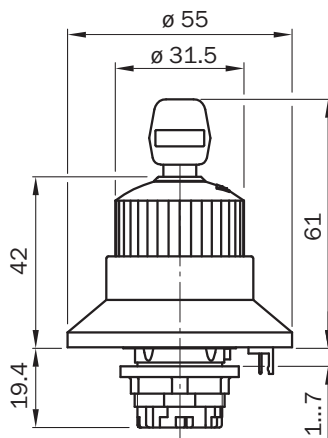
**ES21-AT1130**



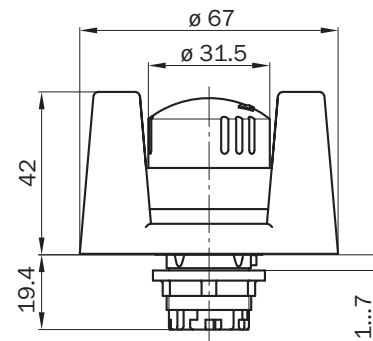
**ES21-AK1120**



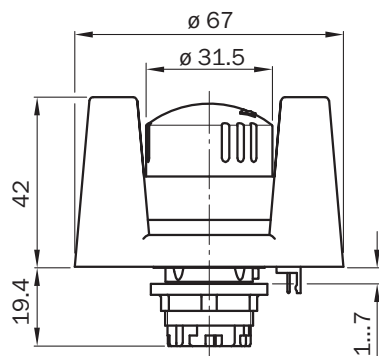
**ES21-AK1130**



**ES21-AT1140**



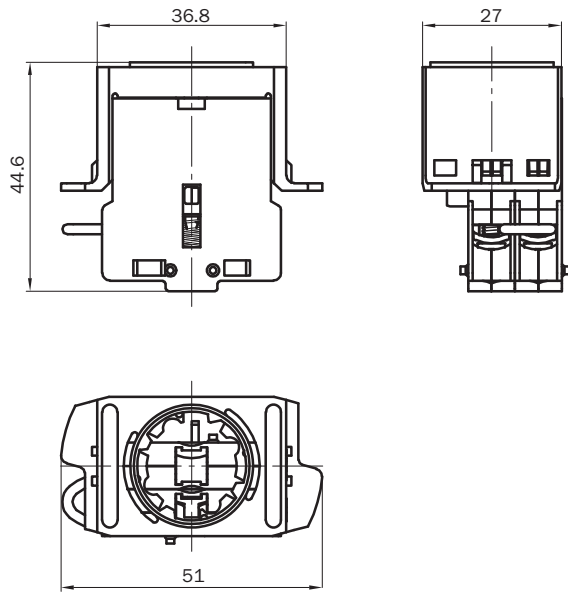
**ES21-AT1150**



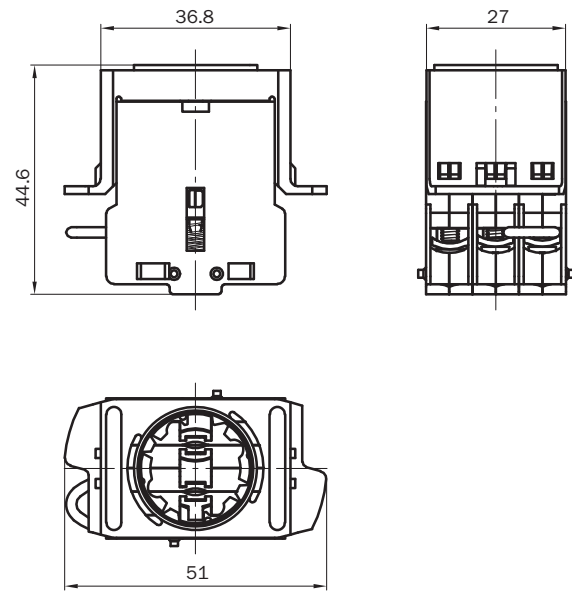
Dimensions in mm

Switching elements

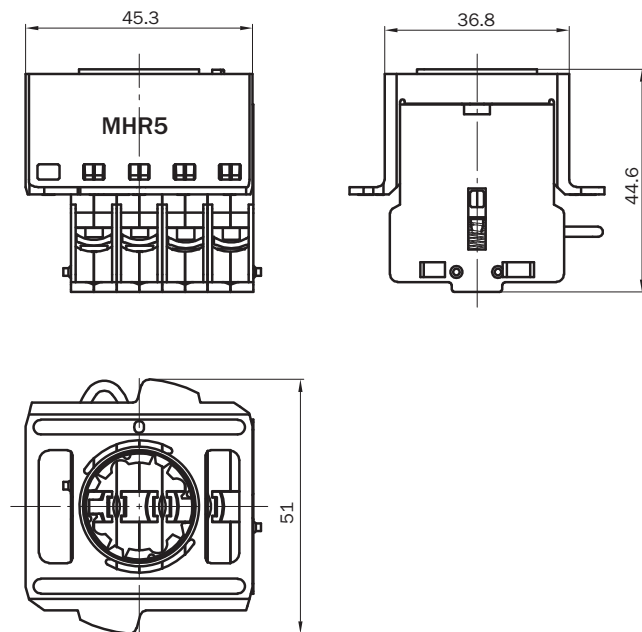
ES21-CG1001



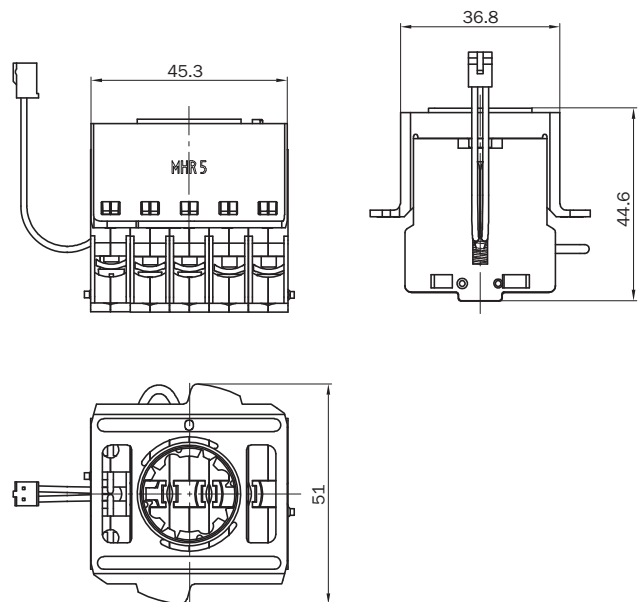
ES21-CG1101, ES21-CG2001



ES21-CH2101, ES21-CH3001



ES21-CH2111

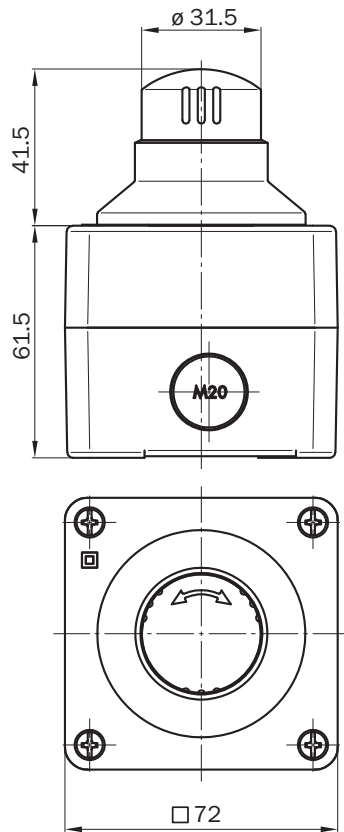


Dimensions in mm

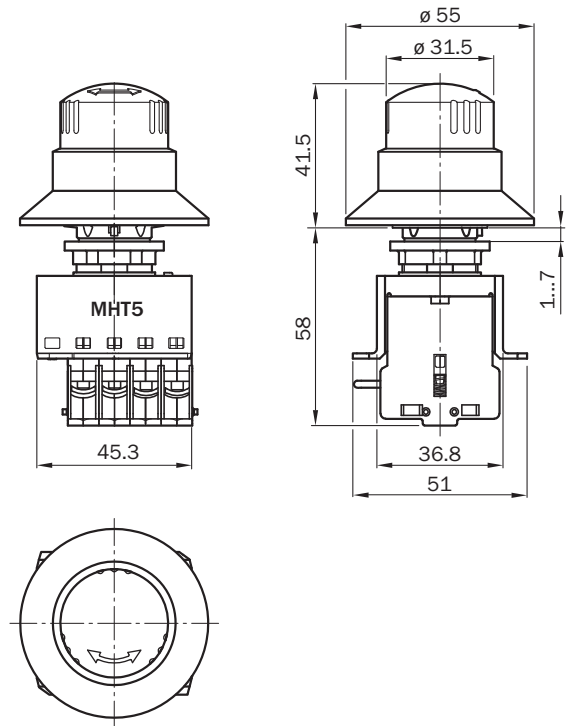


Complete devices

Surface mount version



Panel mount version




Dimensions in mm

Accessories


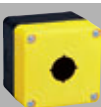
Assembly key

Figure	Usage	Type	Part no.
	Assembly key for pushbuttons	ES21-XA100	5321538

Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164

Other

Figure	Designation	Type	Part no.
	Spare key for pushbuttons with key release	ES21-XA200	5321539
	Housing without illumination	ES21-XS001	5321175





- Rope-operated emergency stop switch according to EN 13850 and EN 60947-5-5
- Die-cast zinc housing
- Cable entry M20
- Housing design according to EN 50041
- Enclosure rating IP 66
- Wide range of accessories for quick installation



## Technical data overview

Number of positive action N/C contacts (depending on type)	2 / 3
Number of N/O contacts (depending on type)	1 / 2
Housing material	Metal
Enclosure rating	IP 66
Connection type	Cable gland

## Product description

- Rope-operated switch
- 4 contacts
- Complete wire sets available for simple installation

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	2	i110-RP223	6025077
3	1	i110-RP313	6025076

Further information	Page
→ Dimensional drawings	M-12
→ Switching elements	M-12
→ Mounting	M-12
→ Accessories	M-13
→ Systematic safety	A-0
→ Services	B-0

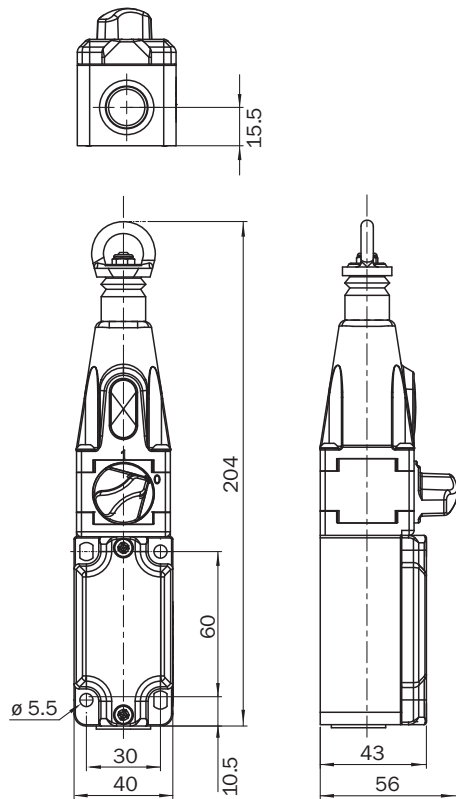
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i110-RP223	i110-RP313
Housing material	Metal	
Surface treatment	Varnished	
Enclosure rating	IP 66	
Safety related parameters		
$B_{10d}$ parameter	2 x 10 <sup>6</sup> switching cycles, with small load	
Mechanical life	1 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	-25 °C ... +80 °C	
Maximum actuation force (deflection)	125 N (300 mm)	
Actuation frequency	Max. 3600/h	
Switching principle	Slow action switching element	
Number of positive action N/C contacts	2	3
Number of N/O contacts	2	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13	
Rated operating current (voltage)	3 A (240 V AC), 2 A (24 V DC)	
Rated insulation voltage $U_i$	250 V	
Rated impulse withstand voltage $U_{imp}$	2500 V AC	
Minimum switching voltage	5 V DC	
Minimum switching current (switching voltage)	5 mA (5 V DC)	
Connection type	Cable gland	
Number of cable glands x size of the screwed joint	1 x M20	
Connection conductor cross-section	1.5 mm <sup>2</sup>	
Short-circuit protection	T6	
Maximum cord length	30 m	
Weight	0.84 kg	



## Dimensional drawings



Dimensions in mm

## Switching elements

	Rope stack	Rope tensioned	Rope pulled
<b>Switching element 22</b>			
<b>Switching element 31</b>			

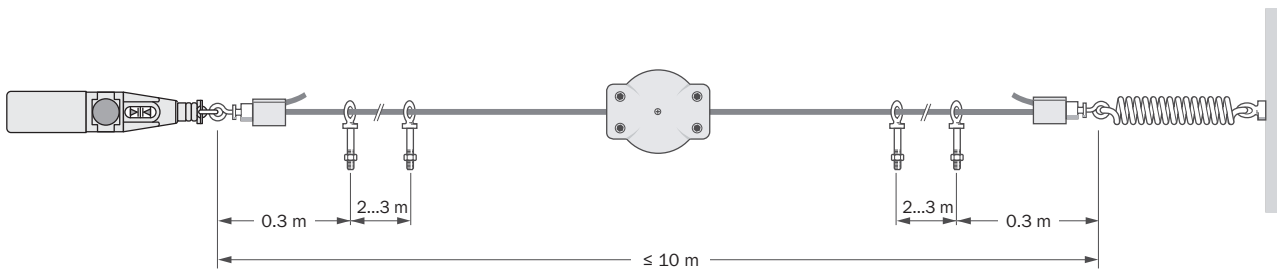
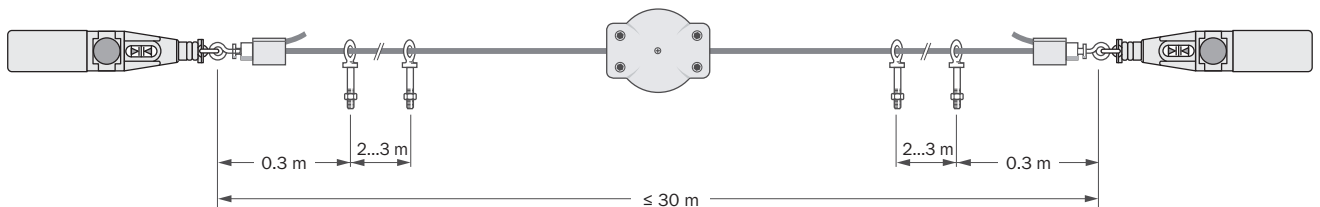
### Switching element 22:

2 positive action N/C contacts + 2 N/O contacts

### Switching element 31:

3 positive action N/C contacts + 1 N/O contact

## Mounting



### Mounting instructions

- For rope lengths up to 10 m, the tensioner spring can be used instead of the second rope switch
- The first and the last eye bolt must be located 300 mm to the rope switch or to the tensioner spring
- Additional eye bolts are spaced 2 to 3 m apart
- The tensioner has to be placed in the middle of the rope



## Accessories

### Rope accessories

Figure	Accessory type	Items supplied	Cord length	Type	Part no.
	Rope accessory set	2 rope grippers, 1 tensioner, 3 eye bolts, 5 m rope, 1 allen key	5 m	iE110-P05	5311136
		2 rope grippers, 1 tensioner, 6 eye bolts, 10 m rope, 1 allen key	10 m	iE110-P10	5311137
		2 rope grippers, 1 tensioner, 10 eye bolts, 20 m rope, 1 allen key	20 m	iE110-P20	5311138
		2 rope grippers, 1 tensioner, 14 eye bolts, 30 m rope, 1 allen key	30 m	iE110-P30	5311139
	Spring	-	-	iE110-PTS	5311290
	Tensioner set	2 rope grippers, 1 tensioner, 1 allen key	-	iE110-PTR	5309034
	Rope gripper	2 rope grippers	-	iE110-PRG	5314230
	Eye bolt	-	-	iE110-PEB	5309035
	Rope	-	30 m	iE110-PL30	5310813
			100 m	iE110-PL100	5310814

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



- Up to 75 m cord length
- Lid-mounted emergency stop button provides E-Stop access even at the ends of the span
- Rope-operated emergency stop switch according to EN 13850 and EN 60947-5-5
- Die-cast zinc housing
- Cable gland 3 x M20
- Wide range of accessories for quick installation



## Technical data overview

Number of positive action N/C contacts (depending on type)	2 / 3
Number of N/O contacts (depending on type)	1 / 2
Housing material	Metal
Enclosure rating	IP 65
Connection type	Cable gland

## Product description

- Rope-operated switch
- 4 contacts
- Complete wire sets available for simple installation

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type	Part no.
2	2	i150-RP223	6024884
3	1	i150-RP313	6024883

Further information	Page
→ Dimensional drawings	M-16
→ Switching elements	M-16
→ Mounting	M-17
→ Accessories	M-18
→ Systematic safety	A-0
→ Services	B-0

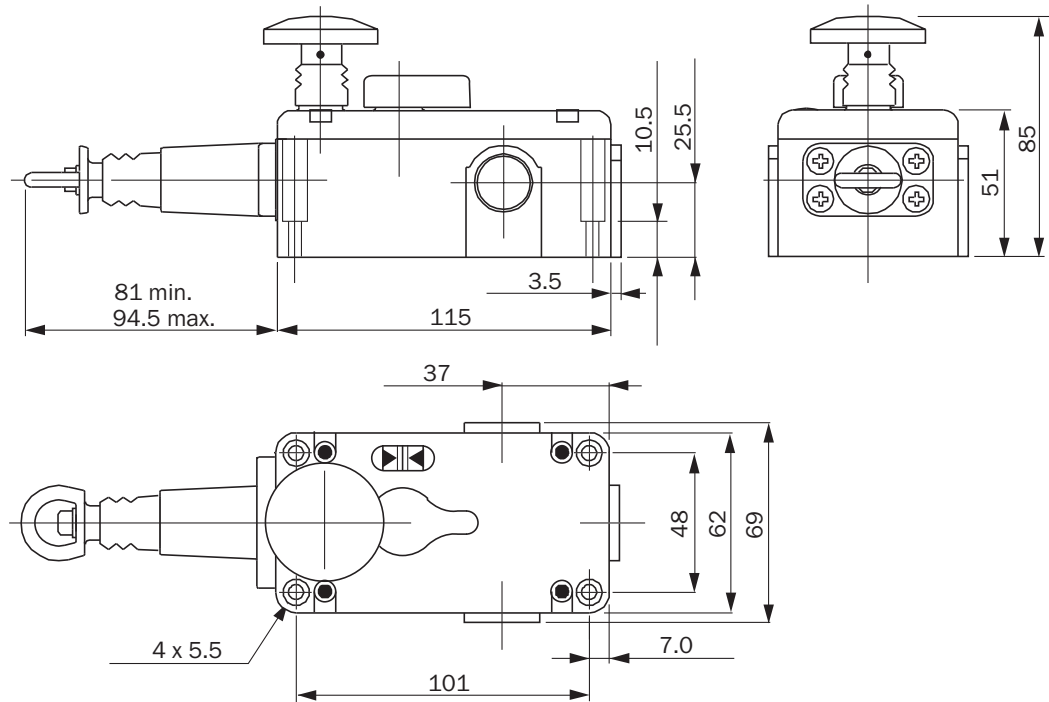
## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	i150-RP223	i150-RP313
Housing material	Metal	
Surface treatment	Varnished	
Enclosure rating	IP 65	
Safety related parameters		
<b>B<sub>10d</sub> parameter</b>	2 x 10 <sup>6</sup> switching cycles, with small load	
Mechanical life	1 x 10 <sup>6</sup> switching cycles	
Ambient operating temperature from ... to	-25 °C ... +80 °C	
Maximum actuation force (deflection)	125 N (300 mm)	
Actuation frequency	Max. 3600/h	
Switching principle	Slow action switching element	
Number of positive action N/C contacts	2	3
Number of N/O contacts	2	1
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13	
Rated operating current (voltage)	3 A (240 V AC), 3 A (24 V DC)	
Rated insulation voltage U <sub>i</sub>	250 V	
Rated impulse withstand voltage U <sub>imp</sub>	2500 V	
Minimum switching voltage	5 V DC	
Minimum switching current (switching voltage)	5 mA (5 V DC)	
Connection type	Cable gland	
Number of cable glands x size of the screwed joint	3 x M20	
Connection conductor cross-section	1.5 mm <sup>2</sup>	
Short-circuit protection	T6	
Maximum cord length	75 m	
Weight	0.75 kg	



## Dimensional drawings



Dimensions in mm

## Switching elements

	Rope stack	Rope tensioned	Rope pulled
Switching element 22			
Switching element 31			

### Switching element 22:

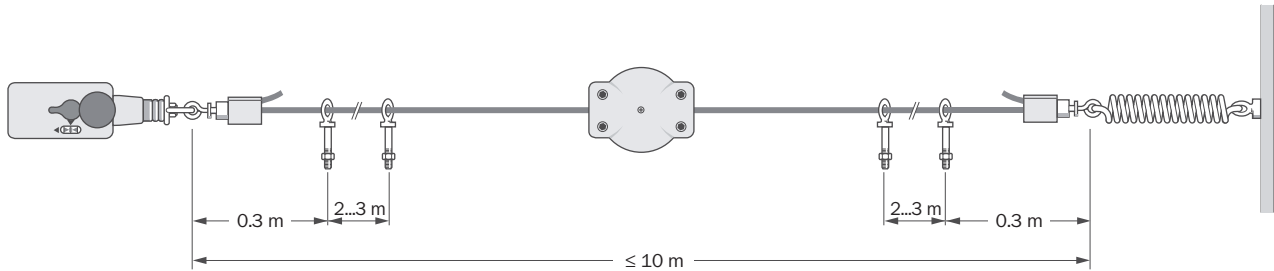
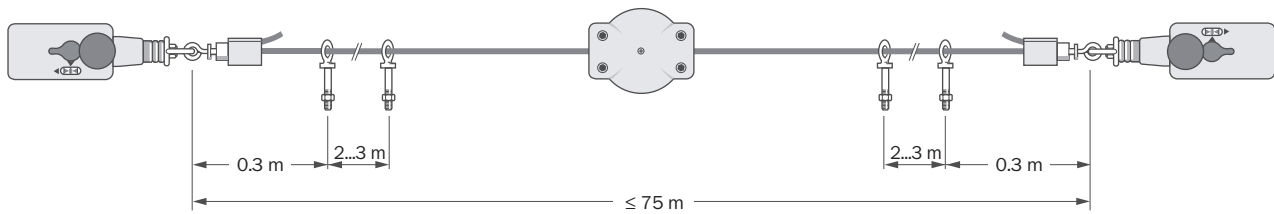
2 positive action N/C contacts + 2 N/O contacts

### Switching element 31:

3 positive action N/C contacts + 1 N/O contact



## Mounting



### Mounting instructions


- For rope lengths up to 10 m, the tensioner spring can be used instead of the second rope switch
- The first and the last eye bolt must be located 300 mm to the rope switch or to the tensioner spring
- Additional eye bolts are spaced 2 to 3 m apart
- The tensioner has to be placed in the middle of the rope

## Accessories

### Rope accessories

Figure	Accessory type	Items supplied	Cord length	Type	Part no.
	Rope accessory set	2 rope grippers, 1 tensioner, 3 eye bolts, 5 m rope, 1 allen key	5 m	iE110-P05	5311136
		2 rope grippers, 1 tensioner, 6 eye bolts, 10 m rope, 1 allen key	10 m	iE110-P10	5311137
		2 rope grippers, 1 tensioner, 10 eye bolts, 20 m rope, 1 allen key	20 m	iE110-P20	5311138
		2 rope grippers, 1 tensioner, 14 eye bolts, 30 m rope, 1 allen key	30 m	iE110-P30	5311139
		2 rope grippers, 1 tensioner, 22 eye bolts, 50 m rope, 1 allen key	50 m	iE110-P50	5320016
		4 rope grippers, 1 tensioner, 32 eye bolts, 75 m rope, 1 allen key	75 m	iE110-P75	5320017
	Spring	-	-	iE110-PTS	5311290
	Tensioner set	2 rope grippers, 1 tensioner, 1 allen key	-	iE110-PTR	5309034
	Rope gripper	2 rope grippers	-	iE110-PRG	5314230
	Eye bolt	-	-	iE110-PEB	5309035
	Rope	-	30 m	iE110-PL30	5310813
			100 m	iE110-PL100	5310814

### Cable gland

Figure	Type	Part no.
	Cable gland M20	5309164



## Technical data overview

Number of positive action N/C contacts	2
Number of N/O contacts	2
Housing material	Plastic
Enclosure rating (depending on type)	IP 65 / IP 67
Connection type	Cable
Cable length (depending on type)	5 m / 10 m / 25 m
Type of connection cable (depending on type)	Coil / straight

## Product description

- Enabling switch for safe maintenance work within a hazardous area
- 4 contacts
- Plus/minus buttons for additional control of direction of movement

## In-system added value

### Safety relays

Safety relays allow simple integration of safety components into machinery or plant.

### Safety controllers

Safety controllers are used when the safety function (e.g., switching off a dangerous movement) needs to be implemented by a logical combination of safety relevant signals. Using a safety controller provides more flexibility for machine operation and ensures that future needs can be met.

### Network solutions

Network solutions are used in larger scale applications in plants and on machines. This saves cabling and enables modular design of the safety automation. Potential errors or faults can be easily localized and quickly trouble-shot thanks to comprehensive diagnostic functions, which significantly reduce machine downtime. SICK offers solutions for a range of communication platforms: AS-i Safety at Work, Device-Net Safety, PROFIBUS/PROFINET, Ether-Net/IP, and Modbus TCP.

## Ordering information

Number of positive action N/C contacts	Number of N/O contacts	Type of connection cable	Cable length	Plus/minus buttons	Type	Part no.
2	2	Coil	5 m	-	E100-A2A22C05A	6021917
			5 m	-	E100-A2A22S05A	6012141
		Straight	10 m	-	E100-A2A22S10A	6021916
			5 m	✓	E100-B2A22S05A	6022879
			10 m	✓	E100-B2A22S10A	6022880
			25 m	✓	E100-B2A22S25A	6033234



- Enabling switch to EN ISO 10218
- Ergonomic design
- Light weight
- 3 position operation
- Options with additional plus/minus buttons



Further information	Page
→ Technical specifications	M-20
→ Dimensional drawings	M-21
→ Actuator travel diagram	M-22
→ Accessories	M-23
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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

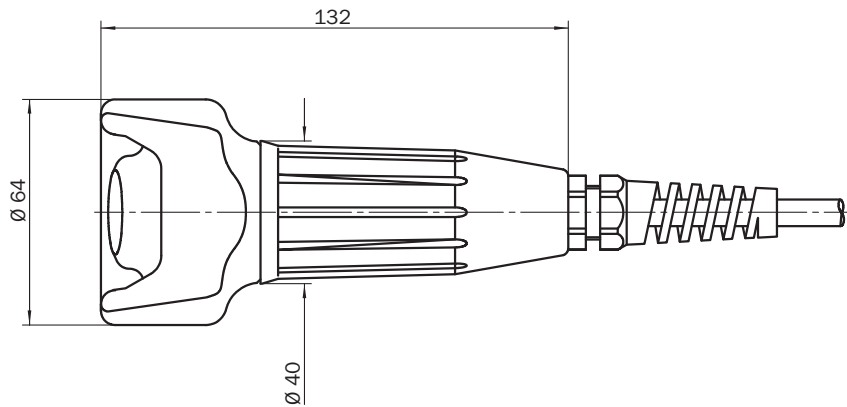
Type	E100-A2A22C05A	E100-A2A22S05A	E100-A2A22S10A	E100-B2A22S05A	E100-B2A22S10A	E100-B2A22S25A
Housing material	Plastic					
Enclosure rating	IP 67			IP 65		
Safety related parameters	1 x 10 <sup>5</sup> switching cycles, with small load					
B <sub>10d</sub> parameter						
Mechanical life	1 x 10 <sup>5</sup> switching cycles					
Ambient operating temperature from ... to	-5 °C ... +50 °C					
Switching principle	Slow action switching element					
Number of positive action N/C contacts	2					
Number of N/O contacts	2					
Usage category in compliance with IEC/EN 60947-5-1	AC-15/DC-13			DC-13		
Rated operating current (voltage)	2 A (230 V AC), 2 A (24 V DC)			2 A (24 V DC)		
Rated insulation voltage U <sub>i</sub>	250 V			32 V		
Rated impulse withstand voltage U <sub>imp</sub>	2500 V AC			800 V AC		
Minimum switching voltage	12 V DC					
Minimum switching current (switching voltage)	1 mA (24 V DC)					
Connection type	Cable					
Connection conductor cross-section	0.34 mm <sup>2</sup>			0.5 mm <sup>2</sup>		
Short-circuit protection	2 A gG			2 A gG / 0.1 A gG		
Weight	1.32 kg	0.86 kg	1.27 kg	1.32 kg		



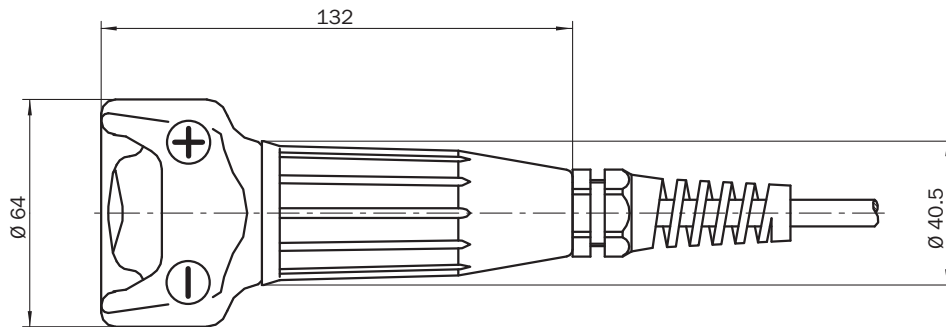


## Dimensional drawings

E100 A



E100 B



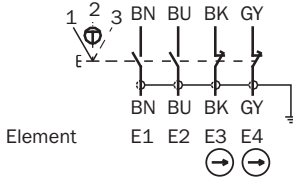
Dimensions in mm



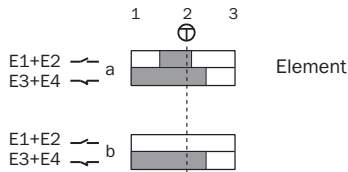
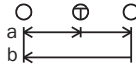
# Actuator travel diagram

## E100 A

2 NO  
2 positive action NC



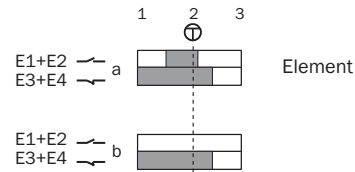
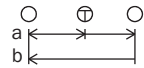
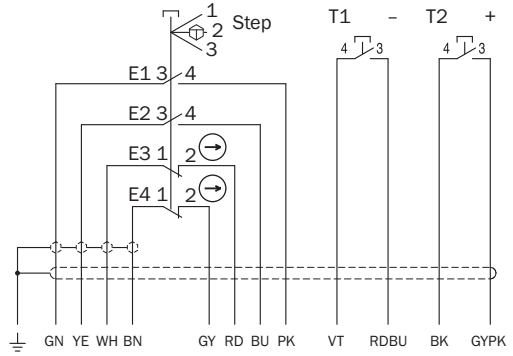
Element



□ Contacts open  
■ Contacts closed

→ Positive action NC  
⊕ Trigger point

## E100 B




□ Contacts open  
■ Contacts closed

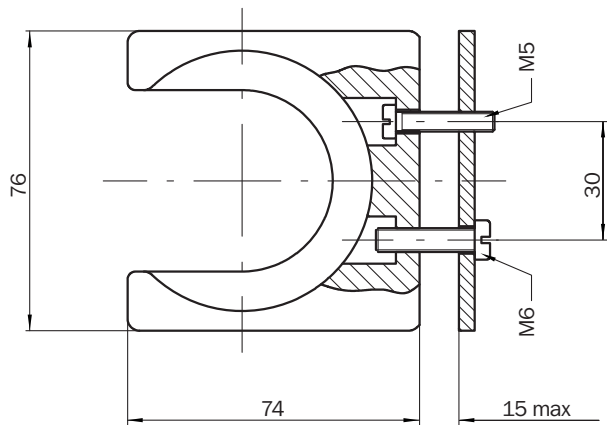
⊕ Trigger point



## Accessories

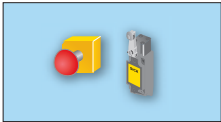


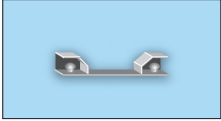


Figure	Type	Part no.
	Fixing bracket	5308209

### Fixing bracket



# Safety relays

## Selection table

Main applications	Mode	Features	Enable current contacts	Product	Page
			Signaling current contacts		
	Single-channel input	Stop cat. 0	$\frac{2}{1}$	<b>UE23-2MF</b>	N-3
			$\frac{3}{1}$	<b>UE23-3MF</b>	N-7
	Dual-channel input	Stop cat. 0	$\frac{2}{1}$	<b>UE43-2MF</b>	N-17
			$\frac{3}{1}$	<b>UE43-3MF</b>	N-22
		Stop cat. 1	$\frac{3}{0}$	<b>UE45-3S1xD33</b> 1 output up to 3 s off-delay	N-40
			$\frac{3}{0}$	<b>UE45-3S1xD330</b> 1 output up to 30 s off-delay	N-40
	Dual-channel input	Stop cat. 0	$\frac{3}{1}$	<b>UE43-3AR</b>	N-27
			$\frac{4}{0}$	<b>UE43-4AR</b>	N-31
	Dual-channel input	Stop cat. 0	$\frac{3}{0}$	<b>UE44-3SLxD33</b> 1 output up to 3 s on-delay	N-35
			$\frac{3}{0}$	<b>UE44-3SLxD330</b> 1 output up to 30 s on-delay	N-35
	Dual-channel input	Stop cat. 0	$\frac{2}{1}$	<b>UE42-2HD</b>	N-12
	Dual-channel input	Stop cat. 0	$\frac{3}{1}$	<b>UE10-30S<sup>1)</sup></b>	N-63
			$\frac{2}{0}$	<b>UE10-2FG<sup>1)</sup></b> <b>UE12-2FG<sup>1)</sup></b>	N-57
	Dual-channel input	Stop cat. 0	$\frac{2}{1}$	<b>UE48-20S</b>	N-46
			$\frac{3}{0}$	<b>UE48-30S</b>	N-52

<sup>1)</sup> Contact expansion module for main units

N



Applications								Technical specifications				Type of unit		Product	Page
Emergency stop pushbutton	Safety switch	Two-hand controls Type III C	Pressure sensitive mats (in 4-wire technology)	Opto-electronic protective devices	Monitoring of simultaneous activation(s)	Manual reset (monitored)	Automatic reset	Category according to EN ISO 13849	Number of enable current paths/signaling current paths	Input circuit (number of channels)	Housing width (mm)	Main unit	Expansion unit		
✓	✓	-	-	-	-	✓	✓	4 <sup>1)</sup>	2 / 1	1	22.5	✓	-	UE23-2MF	N-3
✓	✓	-	-	-	-	✓	✓	4 <sup>1)</sup>	3 / 1	1	22.5	✓	-	UE23-3MF	N-7
-	✓	✓	-	-	0.5	-	✓	4	2 / 1	2	22.5	✓	-	UE42-2HD	N-12
✓	✓	-	-	-	-	✓	✓	4	2 / 1	1 or 2	22.5	✓	-	UE43-2MF	N-17
✓	✓	-	-	-	-	✓	✓	4	3 / 1	1 or 2	45.0	✓	-	UE43-3MF	N-22
-	✓	-	-	-	-	-	✓	4	3 / 1	1 or 2	22.5	✓	-	UE43-3AR	N-27
-	✓	-	-	-	-	-	✓	4	4 / 0	1 or 2	22.5	✓	-	UE43-4AR	N-31
✓	✓	-	-	-	-	✓	✓	4 <sup>2)</sup> / 3 <sup>3)</sup>	3 <sup>4)</sup> / 0	1 or 2	22.5	✓	-	UE44-3SL	N-35
✓	✓	-	-	-	-	✓	✓	4 <sup>2)</sup> / 3 <sup>3)</sup>	3 <sup>5)</sup> / 0	1 or 2	22.5	✓	-	UE45-3S1	N-40
✓	✓	-	✓	✓	-	✓	✓	4	2 / 1	1 or 2	22.5	✓	-	UE48-20S	N-46
✓	✓	-	✓	✓	-	✓	✓	4	3 / 0	1 or 2	22.5	✓	-	UE48-30S	N-52
-	-	-	-	✓	-	-	-	4 <sup>6)</sup>	2 / 0	1 or 2	17.8	-	✓	UE10-2FG / UE12-2FG	N-57
-	-	-	-	✓	-	-	-	4 <sup>6)</sup>	3 / 1	1 or 2	22.5	-	✓	UE10-30S	N-63
-	-	-	-	-	-	-	-	4 <sup>6)</sup>	4 / 2	-	22.5	-	✓	UE10-4XT	N-69
-	-	-	-	-	-	-	-	4 <sup>6)</sup>	4 / 2 <sup>7)</sup>	-	22.5	-	✓	UE11-4DX	N-74

<sup>1)</sup> Maximum category 2, performance level d in the application

<sup>2)</sup> For contacts 13/14, 23/24

<sup>3)</sup> For time contacts 37/38

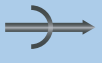
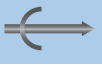
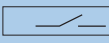
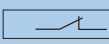
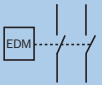


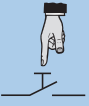







<sup>4)</sup> One normally open contact on-delayed

<sup>5)</sup> One normally open contact off-delayed

<sup>6)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

<sup>7)</sup> Off-delayed

## Symbols

Function		Off-delay
		On-delay
		Normally open contacts
		Normally closed contacts
		External device monitoring
		Contact expansion
Reset		Automatic reset
		Manual reset (monitored)
Applications		Safety switch
		Emergency stop
		Safety laser scanner
		Safety light curtain
		Pressure sensitive mat
		Two-hand controls
		Safety locking device, mechanically locked

## Technical data overview

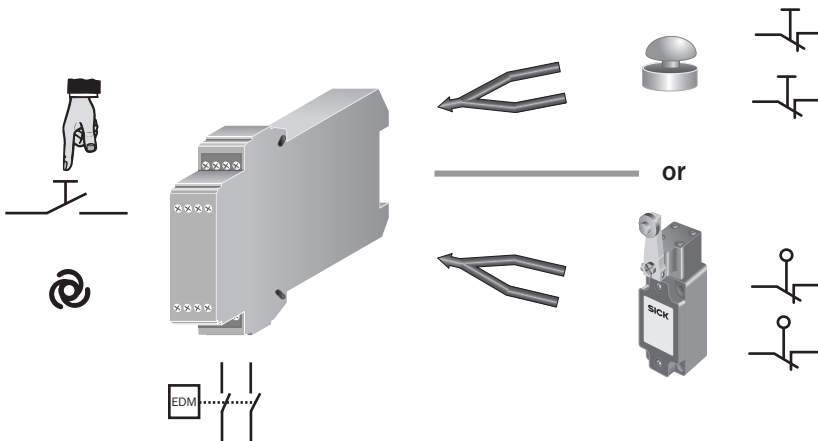
Category	Category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup>
Number of enable current contacts	2
Number of signaling current contacts	1
Input circuit	Single-channel
Housing width	22.5 mm

<sup>1)</sup> Maximum category 2, performance level d, safety integrity level SIL2, SILCL2 in the application

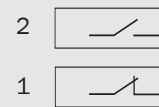
## Product description

- 2 LEDs:
  - Supply voltage
  - Relays K1, K2
- Manual reset
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type terminals

## Applications



- For emergency stop pushbuttons
- For safety switches



## Ordering information

- Connection type: Screw-type terminals

Supply voltage	Type	Part no.
230 V AC	UE23-2MF2A3	6026148
115 V AC	UE23-2MF2A4	6026147
24 V DC	UE23-2MF2D3	6026146

N

Further information	Page
→ Technical specifications	N-4
→ Internal circuitry	N-6
→ Dimensional drawings	N-6
→ Systematic safety	A-0
→ Services	B-0

# Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## General system data

Type	UE23-2MF2A3	UE23-2MF2A4	UE23-2MF2D3
Protection class	II, safe isolation (EN 50178)		
Safety related parameters			
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup>		
Category	Category 4 (EN ISO 13849) <sup>1)</sup>		
Performance level	PL e (EN ISO 13849) <sup>1)</sup>		
B <sub>10d</sub> parameter	1.26 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 1.5 A), 5.9 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.75 A), 4.35 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2.5 A), 1 x 10 <sup>7</sup> switching cycles (DC-13, 24 V, I = 0.63 A)		
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849)		
T <sub>M</sub> (Mission Time)	14 years (EN ISO 13849)		
Stop category	0 (EN 60204)		
Supply voltage	A1, A2		
	230 V AC (196 V AC ... 253 V AC)	115 V AC (98 V AC ... 132 V AC)	24 V DC (20.4 V DC ... 26.4 V DC)
Power consumption	2.7 VA		1.6 W
Residual ripple	2.4 V <sub>pp</sub> <sup>2)</sup>		
Nominal frequency	50 Hz ... 60 Hz		-

<sup>1)</sup> Maximum category 2, performance level d, safety integrity level SIL2, SILCL2 in the application

<sup>2)</sup> In DC operation, within the limits of V<sub>S</sub>

## Control voltage Y1 - Y2 - Y3

Type	UE23-2MF2A3	UE23-2MF2A4	UE23-2MF2D3
Control voltage	Max. 40 V DC		
Control current	Max. 200 mA		
Fuse	PTC resistor		
Reset time			
Manual	Max. 70 ms (Y3)		
Automatic	Max. 600 ms (Y2)		
Galvanized decoupling	✓		-





## Electrical output circuits 13 - 14, 23 - 24, 31 - 32

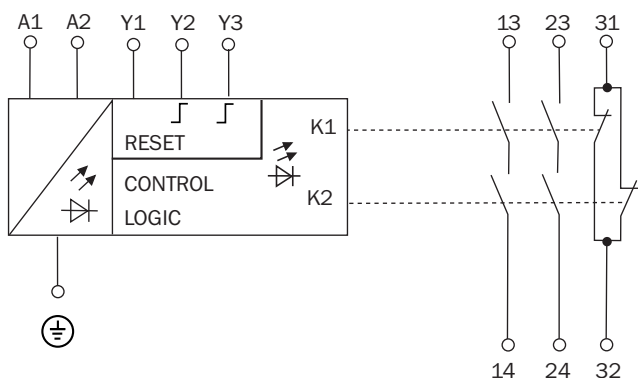
Type	UE23-2MF2A3	UE23-2MF2A4	UE23-2MF2D3
Response time		30 ms ... 80 ms <sup>1)</sup>	
Number of enable current (N/O) contacts		2, relevant for safety	
Number of signaling current (N/C) contacts		1, not safety-relevant	
Contact type		Positively driven	
Contact material		Silver alloy, gold flashed	
Switching voltage		10 V AC ... 230 V AC 10 V DC ... 30 V DC	
Switching current		10 mA ... 6 A	
Total current		12 A	
Usage category		AC-15/DC-13	
Rated operating current (voltage)		4 A (230 V AC) 360 switching cycles/h 3 A (230 V AC) 3600 switching cycles/h 4 A (24 V DC) 360 switching cycles/h 2.5 A (24 V DC) 3600 switching cycles/h	
Maximum switching frequency		3600/h	
Mechanical life (relay contacts)		1 x 10 <sup>7</sup> switching cycles	
Electrical life (relay contacts)		2 x 10 <sup>6</sup> switching cycles	

<sup>1)</sup> K1/K2

## Operating data

Type	UE23-2MF2A3	UE23-2MF2A4	UE23-2MF2D3
Rated impulse withstand voltage U <sub>imp</sub>		4 kV	
Overvoltage category		III	
Contamination rating			
External		3	
Internal		2	
Standard		EN 50178	
Rated insulation voltage U <sub>i</sub>		300 V AC	
Test voltage		2 kV (50 Hz) EN 60439-1	
Enclosure rating			
Clamps		IP 20	
Housing		IP 40	
Interference emission		DIN EN 61000-6-4	
Interference resistance		EN 61000-6-2	
Ambient operating temperature		-25 °C ... +55 °C	
Storage temperature		-25 °C ... +75 °C	
Connection type		Screw-type terminals	
Conductor cross-section			
Single wire (2x, same cross-section)		0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>	
Single wire (1x)		0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Fine wire with ferrules (2x, same cross-section)		0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Fine wire with ferrules (1x)		0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Dimensions (W x H x D)		22.5 mm x 123 mm x 93.5 mm	
Weight		0.27 kg	

## Internal circuitry



### Function

The connected emergency stop pushbuttons or safety switches are controlled by the supply voltage. After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain in the open state. If the con-

nected sensor is not activated (i.e., the input circuits are closed), then the normally open contacts close immediately in automatic reset (LED "K1, K2" illuminates). In the case of manual reset, this only occurs after pressing the reset button.

### External device monitoring (EDM)

The unit can take over the function of external device monitoring. The contactor monitoring system monitors the external relays through their normally closed contacts.

### Manual reset

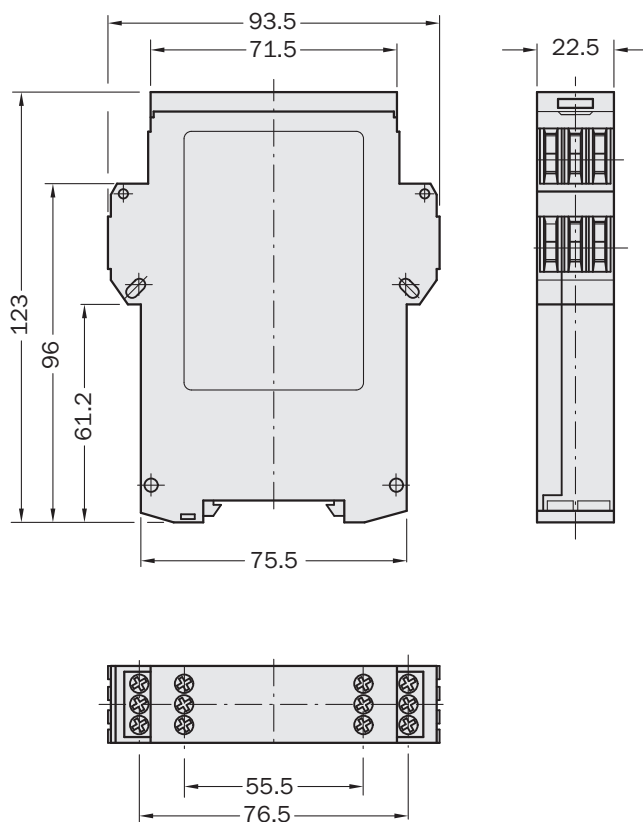
For manual resetting, a pushbutton must be connected to terminals Y1 and Y3. This reset is monitored.

### Automatic reset

For automatic resetting, Y1 - Y2 must be linked.

## Dimensional drawings

### Screw-type terminals



Dimensions in mm

N

## Technical data overview

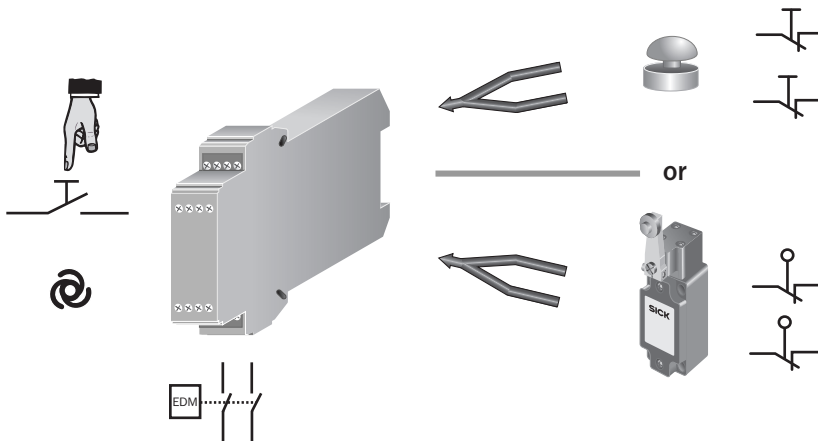
Category	Category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup>
Number of enable current contacts	3
Number of signaling current contacts	1
Input circuit	Single-channel
Housing width	22.5 mm

<sup>1)</sup> Maximum category 2, performance level d, safety integrity level SIL2, SILCL2 in the application

## Product description

- 2 LEDs:
  - Supply voltage
  - Relay K1, K2
- Manual reset
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type or plug-in terminals

## Applications



- For emergency stop pushbuttons
- For safety switches



## Ordering information

Connection type	Supply voltage	Type	Part no.
Screw-type terminals	230 V AC	UE23-3MF2A3	6034597
	115 V AC	UE23-3MF2A4	6034596
	24 V DC	UE23-3MF2D2	6034595
Plug-in terminals	230 V AC	UE23-3MF3A3	6034600
	115 V AC	UE23-3MF3A4	6034599
	24 V DC	UE23-3MF3D2	6034598

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# Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## General system data

Type	UE23-3MF2A3	UE23-3MF2A4	UE23-3MF2D2	UE23-3MF3A3	UE23-3MF3A4	UE23-3MF3D2
<b>Safety related parameters</b>						
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup>					
Category	Category 4 (EN ISO 13849) <sup>1)</sup>					
Performance level	PL e (EN ISO 13849) <sup>1)</sup>					
B <sub>10d</sub> parameter	3 x 10 <sup>5</sup> switching cycles (AC-15, 230 V, I = 5 A), 2 x 10 <sup>6</sup> switching cycles (DC-15, 230 V, I = 2 A), 7 x 10 <sup>6</sup> switching cycles (DC-13, 24 V, I = 1 A)					
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849)					
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)					
<b>Stop category</b>	0 (EN 60204)					
<b>Voltage supply</b>	A1, A2					
	-		PELV (Output circuit > 25 V AC / 60 V DC)	-		PELV (Output circuit > 25 V AC / 60 V DC)
	-		PELV or SELV (Output circuit < 25 V AC / 60 V DC)	-		PELV or SELV (Output circuit < 25 V AC / 60 V DC)
<b>Supply voltage</b>	A1, A2					
	230 V AC (196 V AC ... 253 V AC)	115 V AC (98 V AC ... 132 V AC)	24 V DC (20.4 V DC ... 26.4 V DC)	230 V AC (196 V AC ... 253 V AC)	115 V AC (98 V AC ... 132 V AC)	24 V DC (20.4 V DC ... 26.4 V DC)
<b>Power consumption</b>	3.4 VA		3.9 VA, 1.9 W		3.4 VA, 3.9 VA, 1.9 W	
<b>Residual ripple</b>	2.4 V <sub>pp</sub> <sup>2)</sup>					
<b>Nominal frequency</b>	50 Hz ... 60 Hz		-	50 Hz ... 60 Hz		-
<b>Opening time</b>	Min. 200 ms					

<sup>1)</sup> Maximum category 2, performance level d, safety integrity level SIL2, SILCL2 in the application

<sup>2)</sup> In DC operation, within the limits of V<sub>S</sub>



## Control voltage Y1 - Y2 - Y3

Type	UE23-3MF2A3	UE23-3MF2A4	UE23-3MF2D2	UE23-3MF3A3	UE23-3MF3A4	UE23-3MF3D2
Control voltage	Max. 40 V DC					
Control current	Max. 90 mA					
Short-circuit current	> 1500 mA, Y1					
Fuse	8 A gG, with tripping characteristics B or C					
Reset time						
	<b>Manual</b>					
	Max. 300 ms (Y3)		Max. 60 ms (Y3)	Max. 300 ms (Y3)		Max. 60 ms (Y3)
	<b>Automatic</b>		Max. 600 ms (Y2)			
Galvanized decoupling	✓		-	✓		-
Switch-on time	Max. 300 ms		Max. 60 ms	Max. 300 ms		Max. 60 ms
Reset time	Max. 300 ms		Max. 60 ms	Max. 300 ms		Max. 60 ms
Activation time of reset button	60 ms					
Cable resistance	≤ 70 Ohm					

## Electrical output circuits 13 - 14, 23 - 24, 31 - 32

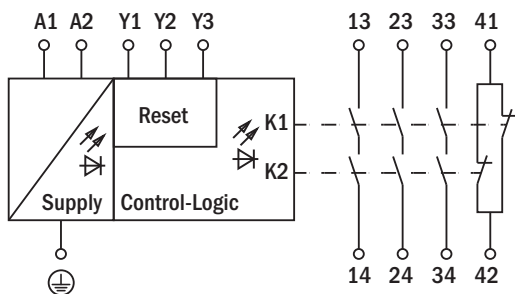
Type	UE23-3MF2A3	UE23-3MF2A4	UE23-3MF2D2	UE23-3MF3A3	UE23-3MF3A4	UE23-3MF3D2
Response time	Max. 80 ms <sup>1)</sup>					
Number of enable current (N/O) contacts	3, relevant for safety					
Number of signaling current (N/C) contacts	1, not safety-relevant					
Contact type	Positively driven					
Contact material	Silver alloy, gold flashed					
Switching voltage	5 V AC ... 300 V AC 5 V DC ... 250 V DC					
Switching current	10 mA ... 8 A					
Usage category	AC-15/DC-13					
Rated operating current (voltage)	5 A (230 V AC) 360 switching cycles/h 5 A (24 V DC) 3600 switching cycles/h					
Maximum switching frequency	3600/h					
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles					
Electrical life (relay contacts)	1 x 10 <sup>6</sup> switching cycles					

<sup>1)</sup> K1/K2

Operating data

Type	UE23-3MF2A3	UE23-3MF2A4	UE23-3MF2D2	UE23-3MF3A3	UE23-3MF3A4	UE23-3MF3D2
Rated impulse withstand voltage $U_{imp}$	4 kV					
Overtoltage category	III					
Contamination rating	External		3			
	Internal		2			
	Standard		EN 50178			
Rated insulation voltage $U_i$	300 V AC					
Test voltage	2 kV (50 Hz) EN 60439-1					
Enclosure rating	Clamps		IP 20			
	Housing		IP 40			
Interference emission	DIN EN 61000-6-4					
Interference resistance	EN 61000-6-2					
Ambient operating temperature	-25 °C ... +55 °C					
Storage temperature	-25 °C ... +75 °C					
Connection type	Screw-type terminals			Plug-in terminals		
Conductor cross-section	Single wire (2x, same cross-section)		0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>			
	Single wire (1x)		0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>			
	Fine wire with ferrules (2x, same cross-section)		0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>			
	Fine wire with ferrules (1x)		0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>			
Dimensions (W x H x D)	22.5 mm x 123 mm x 93.5 mm					
Weight	0.27 kg					

Internal circuitry



Function

The connected emergency stop pushbuttons or safety switches are controlled by the supply voltage. After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain in the open state. If the con-

nected sensor is not activated (i.e., the input circuits are closed), then the normally open contacts close immediately in automatic reset (LED "K1, K2" illuminates). In the case of manual reset, this only occurs after pressing the reset button.

External device monitoring (EDM)

The unit can take over the function of external device monitoring. The contactor monitoring system monitors the external relays through their normally closed contacts.

Manual reset

For manual resetting, a pushbutton must be connected to terminals Y1 and Y3. This reset is monitored.

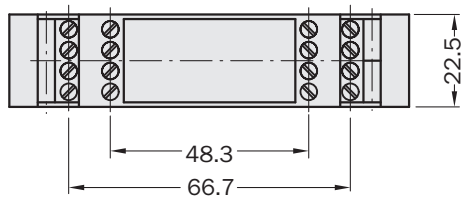
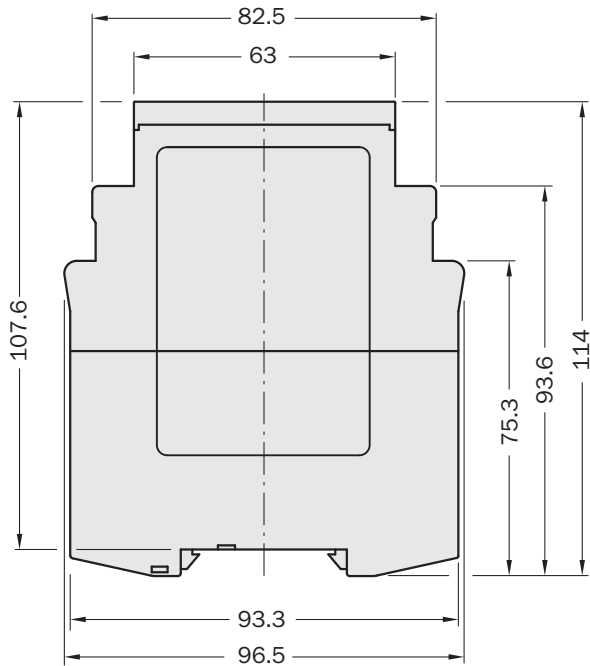
Automatic reset

For automatic resetting, Y1 - Y2 must be linked.

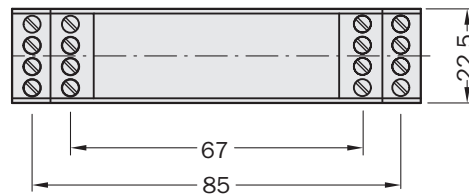
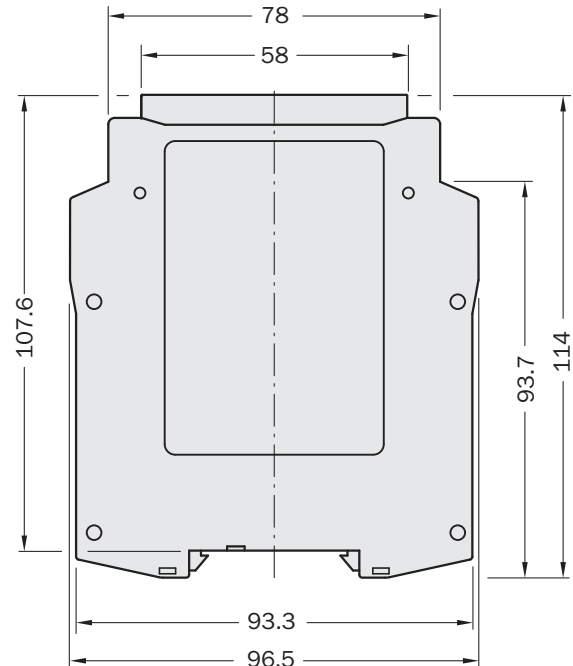


# Dimensional drawings

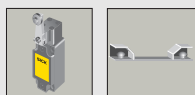
## Screw-type terminals



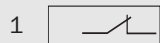
## Plug-in terminals



Dimensions in mm



- For two-hand controls Type III C in accordance with EN 574
- For safety switches



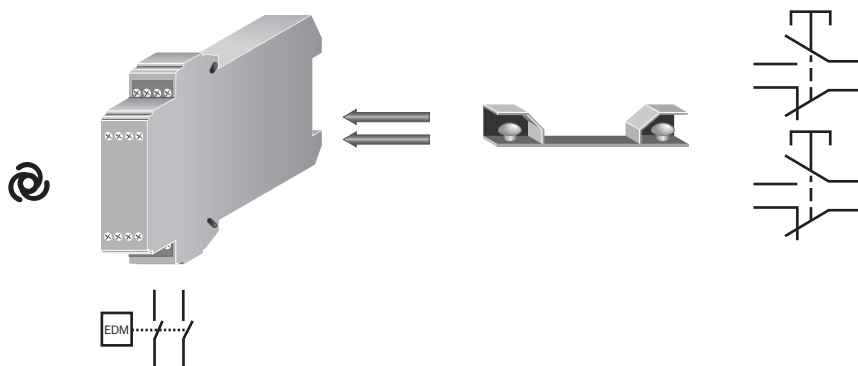
## Technical data overview

Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Two-hand control systems	Type III C (EN 574)
Number of enable current contacts	2
Number of signaling current contacts	1
Input circuit	Single- or dual-channel
Housing width	22.5 mm

## Product description

- 3 LEDs:
  - Supply voltage
  - Relays K1 and K2
- Automatic start
- Additional outputs available with the UE10-4XT contact expansion module
- External device monitoring (EDM)
- Screw-type terminals or plug-in terminals

## Applications



## Ordering information

Connection type	Type	Part no.
Screw-type terminals	UE42-2HD2D2	6024878
Plug-in terminals	UE42-2HD3D2	6024881

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N



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE42-2HD2D2	UE42-2HD3D2
<b>Safety related parameters</b>		
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
B <sub>10d</sub> parameter	1.26 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 1.5 A), 5.9 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.75 A), 4.35 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2.5 A), 1 x 10 <sup>7</sup> switching cycles (DC-13, 24 V, I = 0.63 A)	
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
<b>Voltage supply</b>	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)	
<b>Supply voltage</b>	A1, A2 24 V AC (20.4 V AC ... 26.4 V AC) 24 V DC (20.4 V DC ... 26.4 V DC)	
<b>Power consumption</b>	2.7 VA, 1.5 W	
<b>Residual ripple</b>	2.4 V <sub>pp</sub> <sup>1)</sup>	
<b>Nominal frequency</b>	50 Hz ... 60 Hz <sup>2)</sup>	

<sup>1)</sup> In DC operation, within the limits of V<sub>S</sub>

<sup>2)</sup> In AC operation

### Control voltage Y11, Y21

Type	UE42-2HD2D2	UE42-2HD3D2
<b>Control voltage</b>	24 V DC	
<b>Control current</b>	60 mA	
<b>Short-circuit current</b>	1000 mA, between Y11 and A2	
<b>Fuse</b>	PTC resistor	
<b>Galvanized decoupling</b>	- (between A1, A2 and Y11, Y21)	

### Input circuits Y12, Y14, Y22, Y23

Type	UE42-2HD2D2	UE42-2HD3D2
<b>Switch-on time</b>	250 ms <sup>1)</sup>	
<b>Input current</b>	60 mA	
<b>Reset time</b>	Max. 40 ms	
<b>Activation time tolerance between the two start buttons</b>	500 ms	
<b>Switch-off time</b>	Min. 250 ms	
<b>Cable resistance</b>	< 70 Ohm	

<sup>1)</sup> After applying the supply voltage

Electrical output circuits 13 - 14, 23 - 24, 31 - 32

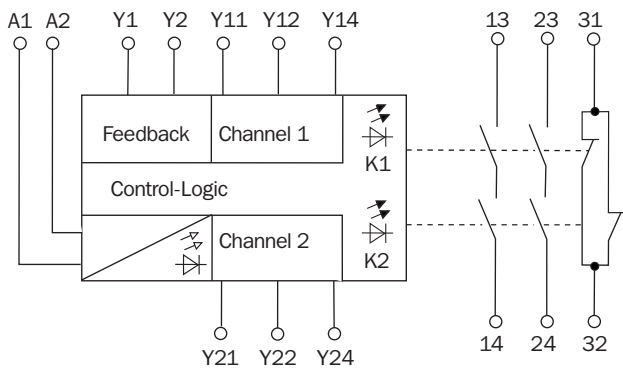
Type	UE42-2HD2D2	UE42-2HD3D2
Response time	50 ms	
Number of enable current (N/O) contacts	2, relevant for safety	
Number of signaling current (N/C) contacts	1, not safety-relevant	
Contact type	Positively driven	
Contact material	Silver alloy, gold flashed	
Switching voltage	10 V AC ... 230 V AC 10 V DC ... 30 V DC	
Switching current	10 mA ... 6 A	
Total current	12 A	
Usage category	AC-15/DC-13	
Rated operating current (voltage)	4 A (230 V AC) 360 switching cycles/h 3 A (230 V AC) 3600 switching cycles/h 4 A (24 V DC) 360 switching cycles/h 2.5 A (24 V DC) 3600 switching cycles/h	
Maximum switching frequency	3600/h	
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles	
Electrical life (relay contacts)	2 x 10 <sup>6</sup> switching cycles	

Operating data

Type	UE42-2HD2D2	UE42-2HD3D2
Rated impulse withstand voltage U <sub>imp</sub>	4 kV	
Overvoltage category	III	
Contamination rating		
External	3	
Internal	2	
Standard	EN 50178	
Rated insulation voltage U <sub>i</sub>	300 V AC	
Test voltage	2 kV (50 Hz) EN 60439-1	
Enclosure rating		
Clamps	IP 20	
Housing	IP 40	
Interference emission	EN 60947-1 02/99	
Interference resistance	EN 60947-1 02/99	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +75 °C	
Connection type	Screw-type terminals	Plug-in terminals
Conductor cross-section		
Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>	
Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm	
Weight	0.2 kg	



## Internal circuitry



### Function

The UE42-2HD unit corresponds to EN 574 Type III C. To release the outputs, the two inputs (e.g., two-hand pushbuttons) must be actuated within 0.5 sec.

After applying the supply voltage to terminals A1 - A2, the LED SUPPLY illuminates to indicate that electrical power is present. Pressing the two-hand pushbuttons S1 and S2 at the same time

(see connection diagrams) closes the two normally open contacts. Releasing one of the buttons will cause the circuits to open.

A renewed attempt to initiate starting is only possible if both start buttons are set to their nominal start position (for two-hand pushbuttons units: if both have been released) and the normally closed contact is closed.

### External device monitoring (EDM)

The UE42-2HD can take over the function of external device monitoring. The normally closed contacts of the external relays are switched in series and connected to terminals Y1 - Y2.

### Automatic start

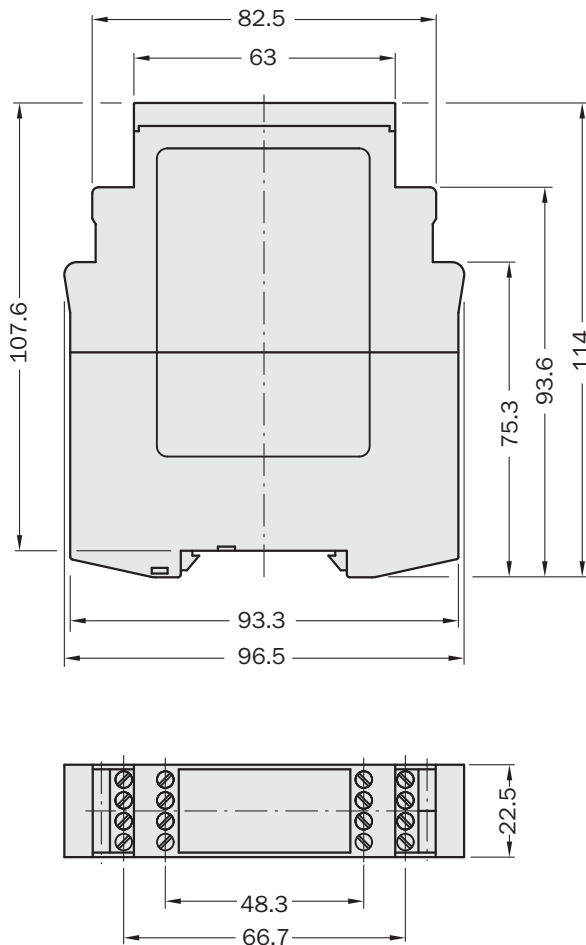
The UE42-2HD has an automatic start facility.

### Monitoring of simultaneous activation

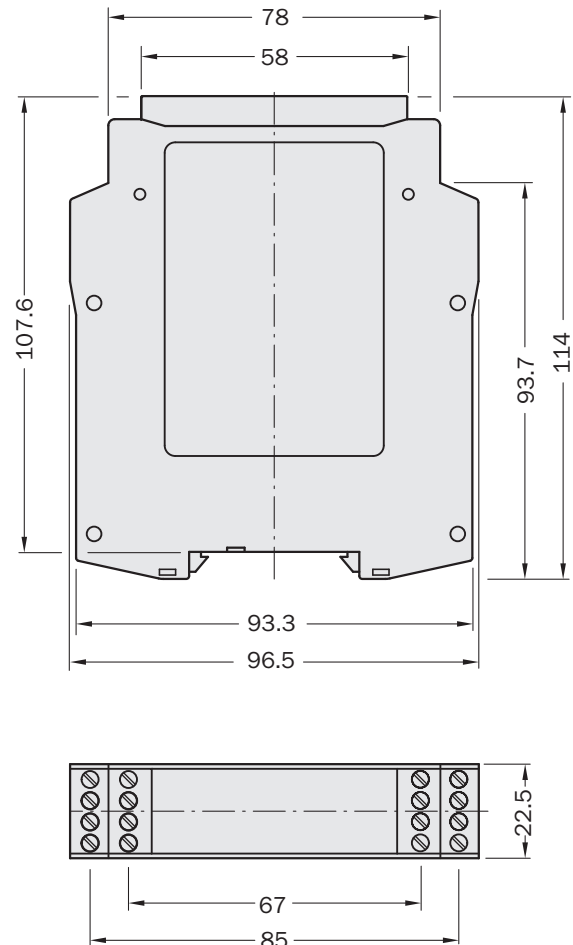
The pressing of the start buttons at the same time is monitored. Only when both start buttons are activated within 0.5 sec do normally open contacts close and the normally closed contact opens.

## Dimensional drawings

### Screw-type terminals



### Plug-in terminals

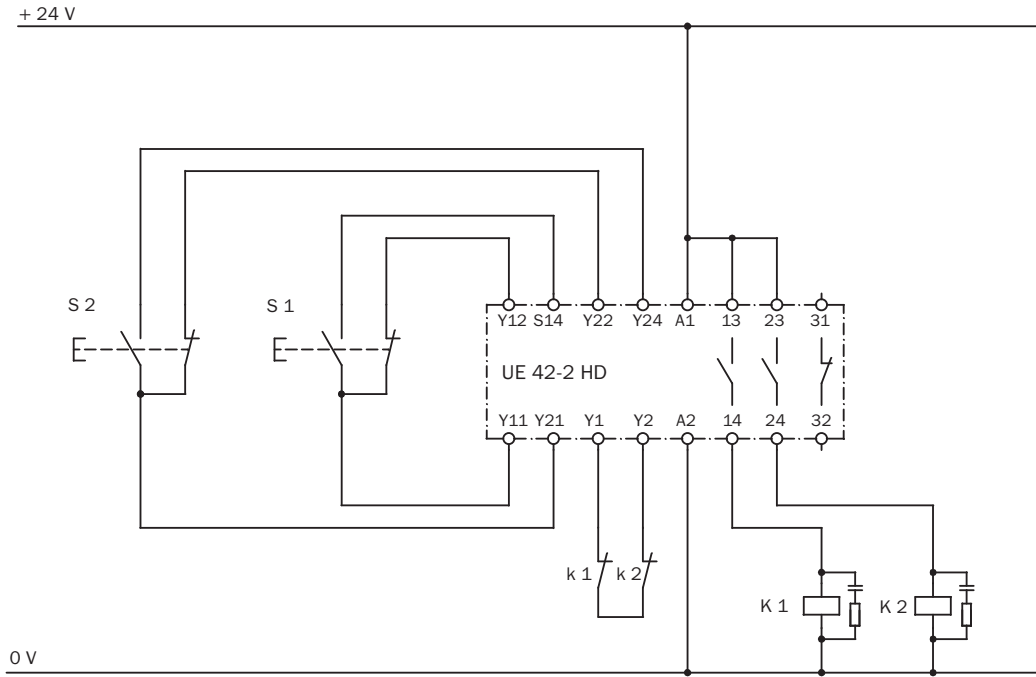


Dimensions in mm

# Connection diagrams

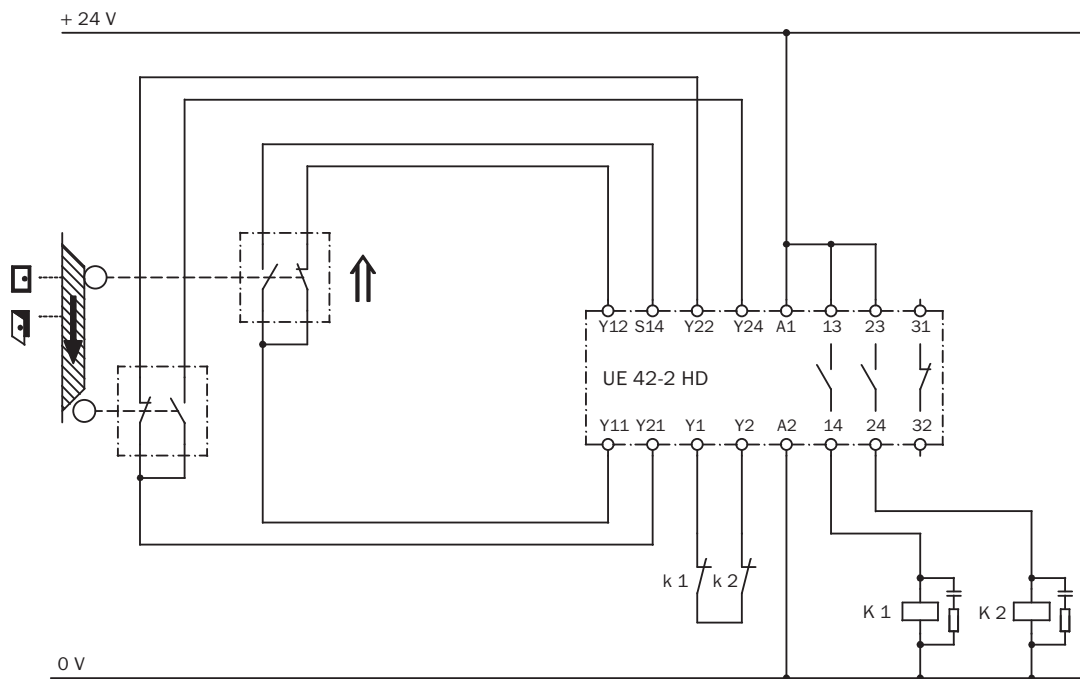
→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## Two-hand control with UE42-2HD safety relay, dual-channel system



Operating mode: with automatic start and external device monitoring (EDM)

## Two safety switches connected to UE42-2HD safety relay, dual-channel system



Operating mode: with automatic reset and external device monitoring (EDM)

N

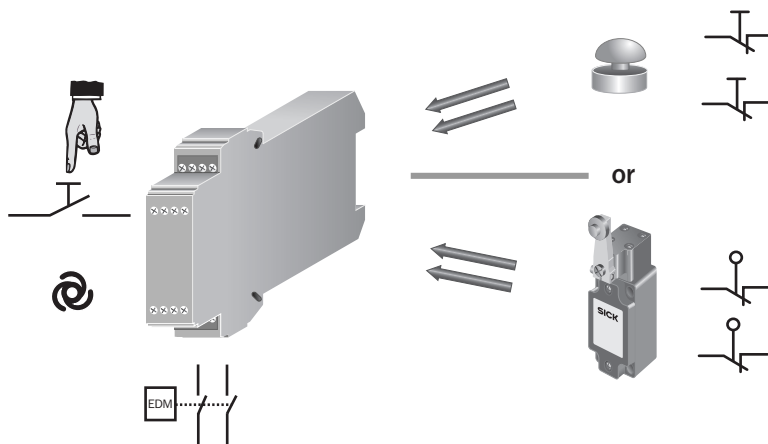
## Technical data overview

Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of enable current contacts	2
Number of signaling current contacts	1
Input circuit	Single- or dual-channel
Housing width	22.5 mm

## Product description

- Cross-circuit detection on dual-channel wired systems
- 3 LEDs:
  - Supply voltage
  - Relay K1
  - Relay K2
- Manual reset
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type terminals or plug-in terminals

## Applications

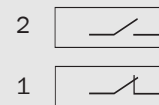


## Ordering information

Connection type	Type	Part no.
Screw-type terminals	UE43-2MF2D2	6024893
Plug-in terminals	UE43-2MF3D2	6024894



- For emergency stop pushbuttons
- For safety switches



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→ Dimensional drawings	N-20
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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE43-2MF2D2	UE43-2MF3D2
<b>Safety related parameters</b>		
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
B <sub>10d</sub> parameter	1.26 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 1.5 A), 5.9 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.75 A), 4.35 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2.5 A), 1 x 10 <sup>7</sup> switching cycles (DC-13, 24 V, I = 0.63 A)	
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Stop category	0 (EN 60204)	
Voltage supply	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)	
Supply voltage	A1, A2 24 V AC (20.4 V AC ... 26.4 V AC) 24 V DC (20.4 V DC ... 26.4 V DC)	
Power consumption	4.6 VA, 2.1 W	
Residual ripple	2.4 V <sub>pp</sub> <sup>1)</sup>	
Nominal frequency	50 Hz ... 60 Hz <sup>2)</sup>	

<sup>1)</sup> In DC operation, within the limits of V<sub>S</sub>

<sup>2)</sup> In AC operation

### Control voltage S11, S21, S33

Type	UE43-2MF2D2	UE43-2MF3D2
Control voltage	17.4 V DC ... 22 V DC	
Control current	40 mA ... 100 mA	
Short-circuit current	2000 mA, between S33 / S11 and S21	
Fuse	PTC resistor	
Reaction time by cross connection	3 s	
Reaction time upon detection of cross connection	3 s	
Galvanized decoupling	- (between A1, A2 and S11, S21, S33)	

### Input circuits S12, S22, S31, S34, S35

Type	UE43-2MF2D2	UE43-2MF3D2
Input current		
S12, S22, S31	40 mA ... 100 mA	
S34, S35	5 mA ... 50 mA	
Reset time		
Manual	Max. 40 ms	
Automatic	200 ms ... 500 ms	
Activation time of reset button	50 ms	
Cable resistance	< 35 Ohm	



## Electrical output circuits 13 - 14, 23 - 24, 31 - 32

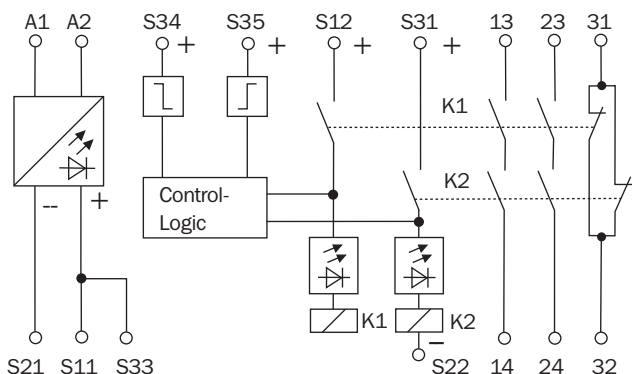
Type	UE43-2MF2D2	UE43-2MF3D2
Response time	25 ms <sup>1)</sup>	
Opening time	40 ms	
Number of enable current (N/O) contacts	2, relevant for safety	
Number of signaling current (N/C) contacts	1, not safety-relevant	
Contact type	Positively driven	
Contact material	Silver alloy, gold flashed	
Switching voltage	10 V AC ... 230 V AC 10 V DC ... 30 V DC	
Switching current	10 mA ... 6 A	
<b>Total current</b>	12 A	
Usage category	AC-15/DC-13	
Rated operating current (voltage)	4 A (230 V AC) 360 switching cycles/h 3 A (230 V AC) 3600 switching cycles/h 4 A (24 V DC) 360 switching cycles/h 2.5 A (24 V DC) 3600 switching cycles/h	
Maximum switching frequency	3600/h	
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles	
Electrical life (relay contacts)	1 x 10 <sup>5</sup> switching cycles	

<sup>1)</sup> K1/K2

## Operating data

Type	UE43-2MF2D2	UE43-2MF3D2
Rated impulse withstand voltage U <sub>imp</sub>	4 kV	
Overvoltage category	III	
Contamination rating		
External	3	
Internal	2	
Standard	EN 50178	
Rated insulation voltage U <sub>i</sub>	300 V AC	
Test voltage	2 kV (50 Hz) EN 60439-1	
Enclosure rating		
Clamps	IP 20	
Housing	IP 40	
Interference emission	DIN EN 61000-6-4	
Interference resistance	EN 61000-6-2	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +75 °C	
Connection type	Screw-type terminals	Plug-in terminals
Conductor cross-section		
Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>	
Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm	
Weight	0.2 kg	

## Internal circuitry



### Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain in the opened state. If the connected sensor is not activated (i.e., the input circuits are closed), then the normally open contacts close immediately in automatic

reset (LED K1 and K2 illuminate). In the case of manual reset, this only occurs after pressing and releasing the reset button. Activation of the sensor (opening of one or both input circuits) affects the opening of the normally open outputs (LED K1 and K2 off).

### External device monitoring (EDM)

The UE43-2MF unit can take over the function of external device monitoring. The contactor monitoring system monitors the external relays by means of their normally closed contacts.

### Manual reset

For manual resetting, a pushbutton must be connected to terminals S33 - S34. Reset is monitored.

### Automatic reset

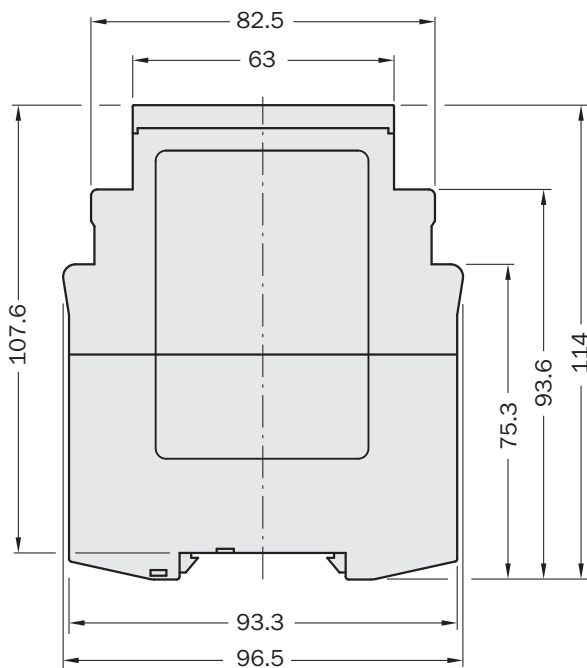
For automatic resetting, S12 - S35 must be linked.

### Cross-circuit detection

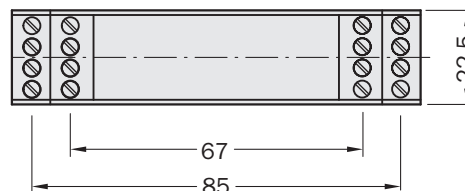
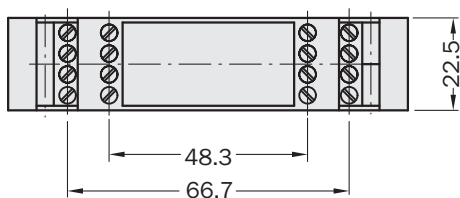
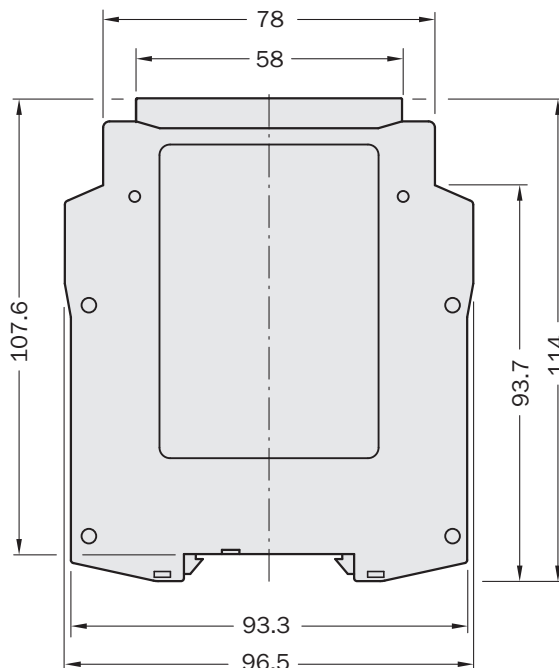
Cross-circuit is detected on dual-channel wired systems if these are wired with opposing polarity.

## Dimensional drawings

### Screw-type terminals



### Plug-in terminals



Dimensions in mm

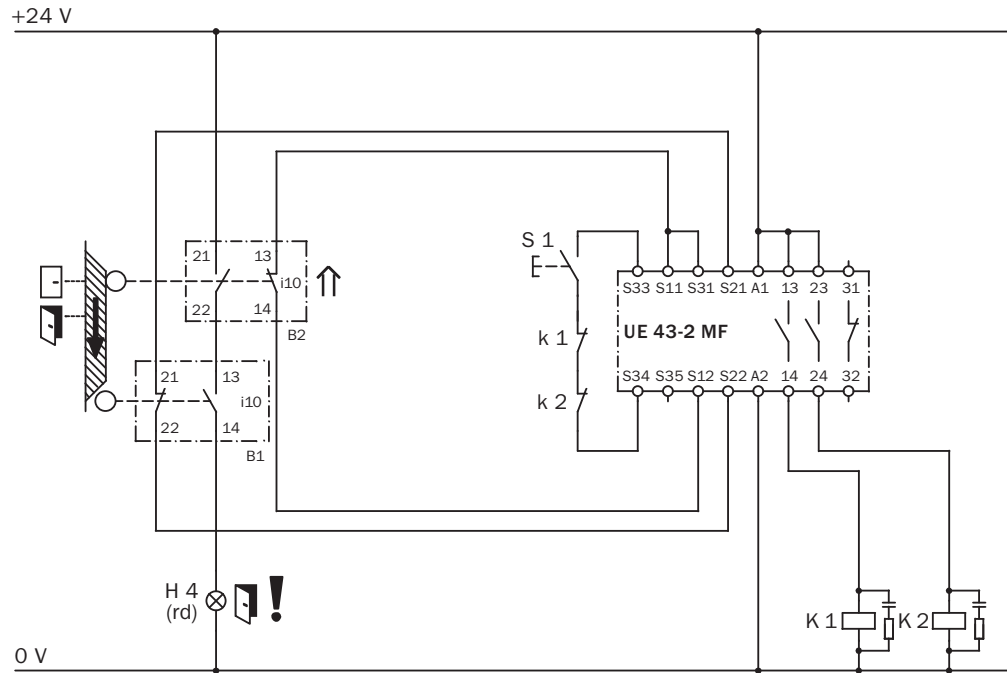
N



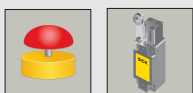
## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

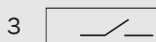
### Two i10 safety switches to UE43-2MF safety relay, dual-channel system



Operating mode: with manual reset and external device monitoring (EDM)



- For emergency stop pushbuttons
- For safety switches



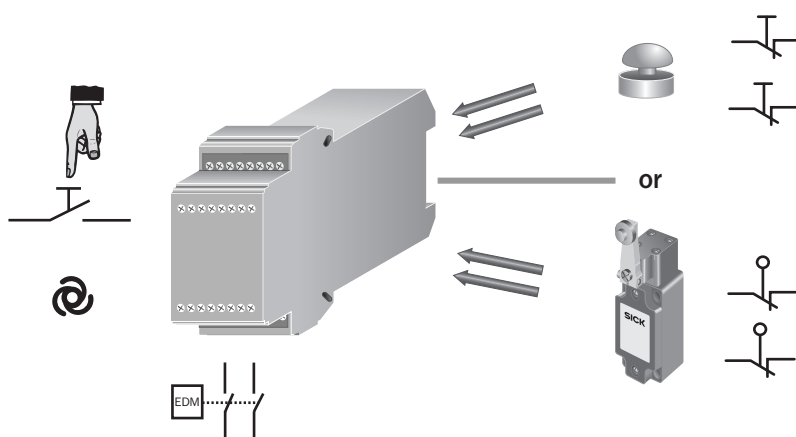
## Technical data overview

Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of enable current contacts	3
Number of signaling current contacts	1
Input circuit	Single- or dual-channel
Housing width	45 mm

## Product description

- Cross-circuit detection on dual-channel wired systems
- 3 LEDs:
  - Supply voltage
  - Relays K2 and K3
- Manual reset
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)

## Applications



## Ordering information

Supply voltage	Type	Part no.
24 V DC	UE43-3MF2D3	6024897
24 V AC	UE43-3MF2A0	6024898
115 V AC	UE43-3MF2A1	6024899
120 V AC	UE43-3MF2A2	6024900
230 V AC	UE43-3MF2A3	6024901

Further information	Page
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→ Dimensional drawings	N-26
→ Connection diagrams	N-26
→ Systematic safety	A-0
→ Services	B-0

N

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE43-3MF2D3	UE43-3MF2A0	UE43-3MF2A1	UE43-3MF2A2	UE43-3MF2A3
<b>Safety related parameters</b>					
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)				
Category	Category 4 (EN ISO 13849)				
Performance level	PL e (EN ISO 13849)				
B <sub>10d</sub> parameter	1 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.5 A), 3.5 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2 A), 1.2 x 10 <sup>6</sup> switching cycles (DC-13, 24 V, I = 0.5 A)				
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849)				
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)				
<b>Stop category</b>	0 (EN 60204)				
<b>Voltage supply</b>	A1, A2				
PELV (Output circuit > 25 V AC / 60 V DC)	-				
PELV or SELV (Output circuit < 25 V AC / 60 V DC)	-				
	Use of earth conductor terminal				
<b>Supply voltage</b>	A1, A2				
	24 V DC (20.4 V DC ... 26.4 V DC)	24 V AC (20.4 V AC ... 26.4 V AC)	115 V AC (97.75 V AC ... 126.5 V AC)	120 V AC (102 V AC ... 132 V AC)	230 V AC (195.5 V AC ... 253 V AC)
<b>Power consumption</b>	1 W	3.2 VA, 2.5 W			
<b>Residual ripple</b>	2.4 V <sub>pp</sub> <sup>1)</sup>				
<b>Nominal frequency</b>	-	50 Hz ... 60 Hz			

<sup>1)</sup> In DC operation, within the limits of V<sub>S</sub>

### Control voltage Y11, Y21

Type	UE43-3MF2D3	UE43-3MF2A0	UE43-3MF2A1	UE43-3MF2A2	UE43-3MF2A3
<b>Control voltage</b>	24 V DC				
<b>Control current</b>	40 mA				
<b>Short-circuit current</b>	1000 mA, between Y11 and A2				
<b>Fuse</b>	PTC resistor	Short-circuit protected transformer			
<b>Galvanized decoupling</b>	-	✓ (between A1, A2 and Y11, Y21, PE)			



Input circuits Y12, Y22, Y31

Type	UE43-3MF2D3	UE43-3MF2A0	UE43-3MF2A1	UE43-3MF2A2	UE43-3MF2A3
Input current	Y12, Y22, Y31		15 mA		
	Y13, Y14		40 mA		
Reset time	Manual		150 ms ... 250 ms, Y13		
	Automatic		0.8 s (1.2 s)		
Synchronous time monitoring	500 ms				
Switch-on time	Min. 100 ms				
Cable resistance	< 70 Ohm				

Electrical output circuits 13 - 14, 23 - 24, 33 - 34, 41 - 42

Type	UE43-3MF2D3	UE43-3MF2A0	UE43-3MF2A1	UE43-3MF2A2	UE43-3MF2A3
Response time	50 ms <sup>1)</sup>				
Number of enable current (N/O) contacts	3, relevant for safety				
Number of signaling current (N/C) contacts	1, not safety-relevant				
Contact type	Positively driven				
Contact material	Silver alloy, gold flashed				
Switching voltage	10 V AC ... 230 V AC				
	10 V DC ... 30 V DC				
Switching current	10 mA ... 6 A				
	Total current	18 A			
Usage category	AC-15/DC-13				
Rated operating current (voltage)	6 A (230 V AC) 3600 switching cycles/h 6 A (24 V DC) 360 switching cycles/h 3 A (24 V DC) 3600 switching cycles/h				
Maximum switching frequency	3600/h				
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles				
Electrical life (relay contacts)	2 x 10 <sup>6</sup> switching cycles				

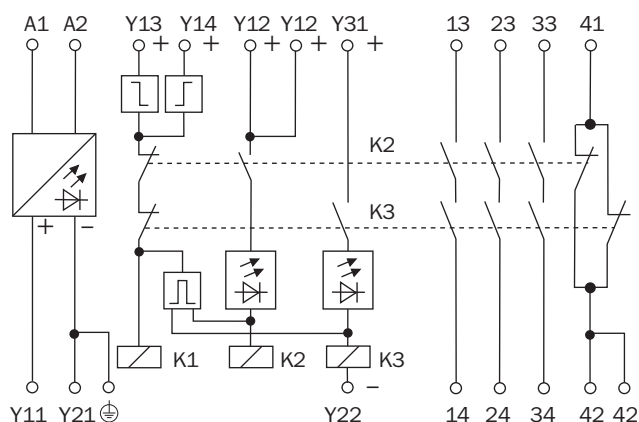
<sup>1)</sup> K2/K3



Operating data

Type	UE43-3MF2D3	UE43-3MF2A0	UE43-3MF2A1	UE43-3MF2A2	UE43-3MF2A3
Rated impulse withstand voltage $U_{imp}$	4 kV				
Overvoltage category	III				
Contamination rating	External	3			
	Internal	2			
	Standard	EN 50178			
Rated insulation voltage $U_i$	300 V AC				
Test voltage	2 kV (50 Hz) EN 60439-1				
Enclosure rating	Clamps	IP 20			
	Housing	IP 40			
Interference emission	DIN EN 61000-6-4				
Interference resistance	EN 61000-6-2				
Ambient operating temperature	-25 °C ... +55 °C				
Storage temperature	-25 °C ... +75 °C				
Connection type	Screw-type terminals				
Conductor cross-section	Single wire (2x, same cross-section)	0.75 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>			
	Single wire (1x)	0.75 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>			
	Fine wire with ferrules (2x, same cross-section)	0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>			
	Fine wire with ferrules (1x)	0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>			
Dimensions (W x H x D)	45 mm x 120.5 mm x 75 mm				
Weight	0.3 kg				0.36 kg

Internal circuitry



Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain open. If the connected sensor is not activated (i.e., the input circuits are closed), the normally open contacts close immediately in automatic reset (LED K2 and K3 illuminate). In the case of manual resetting, this only occurs upon pressing and releasing the reset button.

Activation of the sensor (opening of one or both input circuits) affects the opening of the normally open contacts (LED K2 and K3 off).

External device monitoring (EDM)

The UE43-3MF unit can take over the external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

Manual reset

For manual resetting, a pushbutton must be connected to terminals Y12 and Y13. Reset is monitored.

Automatic reset

For automatic resetting, Y12 - Y14 must be linked.

Cross-circuit detection

Cross-circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

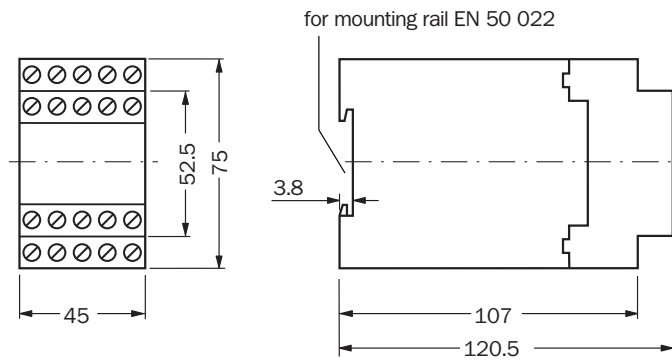
Monitoring of synchronization

Only if input 2 closes no later than 0.5 sec after input 1, do the output circuits close. If input 2 closes before input 1, the synchronization monitoring will not be affected, and the output circuits will close. This monitoring only takes place in automatic reset.



## Dimensional drawings

### Screw-type terminals

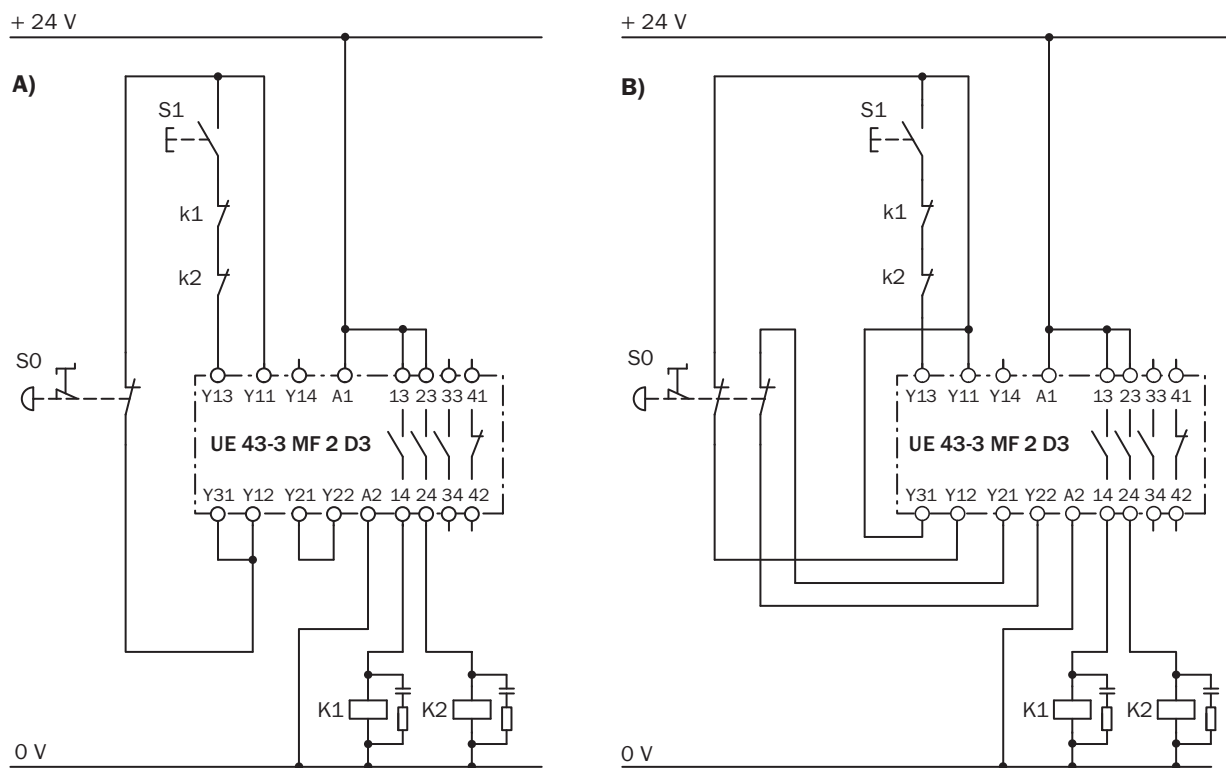


Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Emergency stop switch connected to UE43-3MF2D3 safety relay



Operating mode: with manual reset and external device monitoring. **A)** Single-channel system, **B)** Dual-channel system

N

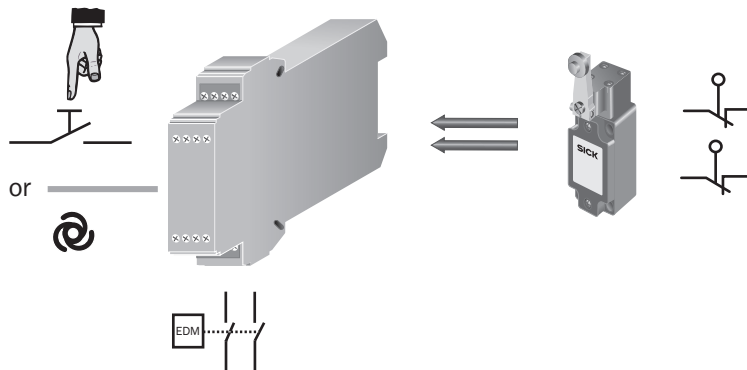
## Technical data overview

Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of enable current contacts	3
Number of signaling current contacts	1
Input circuit	Single- or dual-channel
Housing width	22.5 mm

## Product description

- Cross-circuit detection on dual-channel wired systems
- 3 LEDs:
  - Supply voltage
  - Relays K1 and K2
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type terminals or plug-in terminals

## Applications



## Ordering information

- Supply voltage: 24 V DC
- Reset/restart: Automatic

Connection type	Type	Part no.
Screw-type terminals	UE43-3AR2D2	6034565
Plug-in terminals	UE43-3AR3D2	6034568



- For safety switches



N

Further information	Page
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→ Dimensional drawings	N-30
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→ Services	B-0

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE43-3AR2D2	UE43-3AR3D2
Supply voltage	24 V DC	
Safety related parameters		
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
B <sub>10d</sub> parameter	3 x 10 <sup>5</sup> switching cycles (AC-15, 230 V, I = 5 A), 2 x 10 <sup>6</sup> switching cycles (DC-15, 230 V, I = 2 A), 7 x 10 <sup>6</sup> switching cycles (DC-13, 24 V, I = 1 A)	
PFHd (mean probability of a dangerous failure per hour)	1.30 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Stop category	0 (EN 60204)	
Voltage supply	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)	
Supply voltage	A1, A2 24 V DC (20.4 V DC ... 26.4 V DC)	
Power consumption	3.6 VA, 2.1 W	
Residual ripple	2.4 V <sub>pp</sub> <sup>1)</sup>	

<sup>1)</sup> In DC operation, within the limits of V<sub>S</sub>

### Control voltage S11

Type	UE43-3AR2D2	UE43-3AR3D2
Control voltage	24 V DC (19.2 V DC ... 40 V DC)	
Control current	25 mA (max. 100 mA)	
Fuse	8 A gG, with tripping characteristics B or C	
Reset time	Max. 350 ms (S34)	
Galvanized decoupling	-	

### Input circuits Y12, Y22, Y31

Type	UE43-3AR2D2	UE43-3AR3D2
Switch-on time	350 ms	
Input voltage	24 V DC (19.2 V DC ... 26.6 V DC)	
Input current	S12, S52, S22, S34 25 mA, 100 mA	
Reset time	Max. 350 ms (S34)	
Switch-on time	Min. 350 ms	
Switch-off time	Min. 10 ms	
Cable resistance	< 70 Ohm	

N



## Electrical output circuits 13 - 14, 23 - 24, 33 - 34, 41 - 42

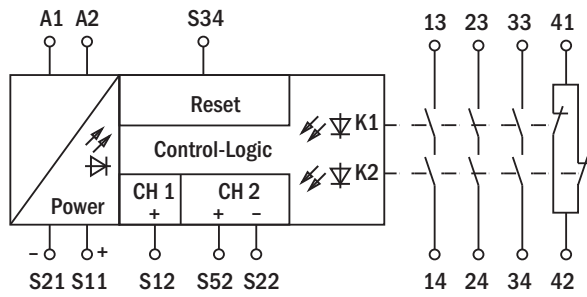
Type	UE43-3AR2D2	UE43-3AR3D2
Response time	Max. 10 ms <sup>1)</sup>	
Number of enable current (N/O) contacts	3, relevant for safety	
Number of signaling current (N/C) contacts	1, not safety-relevant	
Contact type	Positively driven	
Contact material	Silver alloy, gold flashed	
Switching voltage	5 V AC ... 300 V AC 5 V DC ... 250 V DC	
Switching current	10 mA ... 8 A	
Usage category	AC-15/DC-13	
Rated operating current (voltage)	5 A (230 V AC) 360 switching cycles/h 5 A (24 V DC) 3600 switching cycles/h	
Maximum switching frequency	3600/h	
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles	
Electrical life (relay contacts)	1 x 10 <sup>6</sup> switching cycles	

<sup>1)</sup> K1/K2

## Operating data

Type	UE43-3AR2D2	UE43-3AR3D2
Rated impulse withstand voltage U <sub>imp</sub>	4 kV	
Overvoltage category	III	
Contamination rating		
External	3	
Internal	2	
Standard	EN 50178	
Rated insulation voltage U <sub>i</sub>	300 V AC	
Test voltage	2 kV (50 Hz) EN 60439-1	
Enclosure rating		
Clamps	IP 20	
Housing	IP 40	
Interference emission	DIN EN 61000-6-4	
Interference resistance	EN 61000-6-2	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +75 °C	
Connection type	Screw-type terminals	Plug-in terminals
Conductor cross-section		
Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>	
Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm	
Weight	0.21 kg	

## Internal circuitry



### Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain in the opened state. If the connected sensor is not activated (i.e., the input circuits are closed), then the normally open contacts close immediately in

automatic reset (LED K1 and K2 illuminate). Activation of the sensor (opening of one or both input circuits) affects the opening of the normally open outputs (LED K1 and K2 off).

### External device monitoring (EDM)

The UE43-3AR unit can take over the function of external device monitoring. The contactor monitoring system monitors the external relays by means of their normally closed contacts. Connecting the EDM contacts between S11 and S34 replaces the wire link.

### Automatic reset

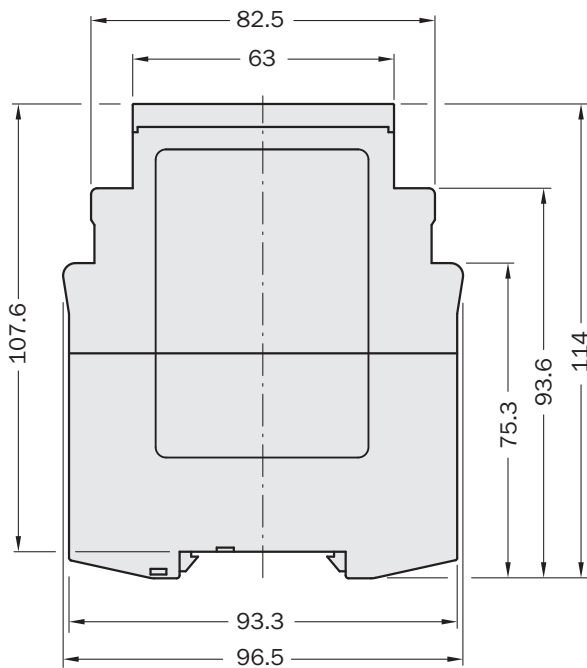
For automatic resetting, S11 - S34 must be linked.

### Cross-circuit detection

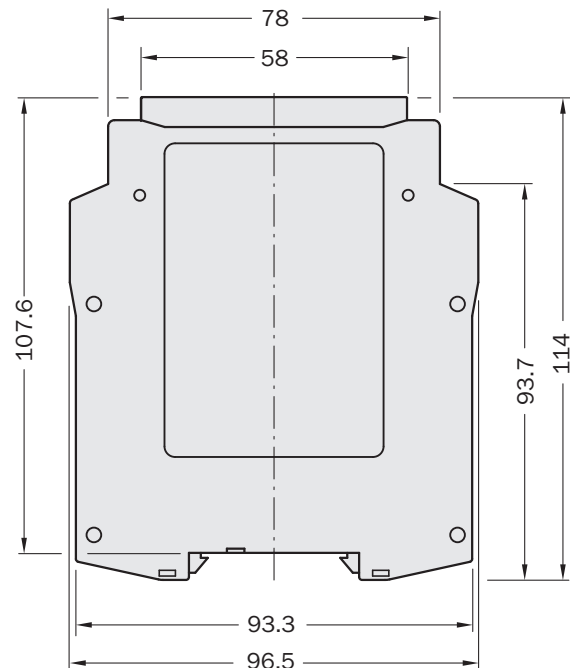
Cross-circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

## Dimensional drawings

### Screw-type terminals



### Plug-in terminals



Dimensions in mm

N

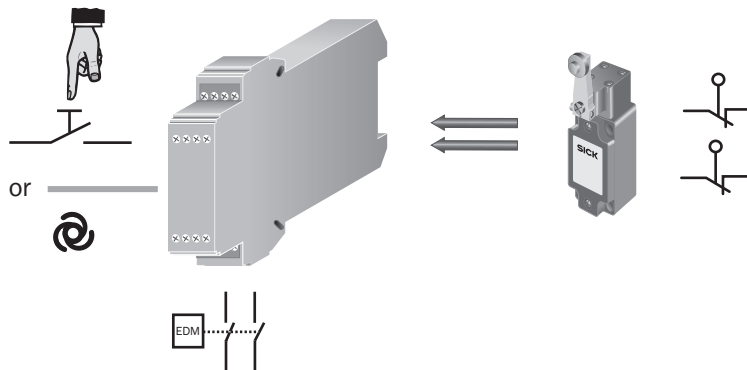
## Technical data overview

Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of enable current contacts	4
Number of signaling current contacts	0
Input circuit	Single- or dual-channel
Housing width	22.5 mm

## Product description

- Cross-circuit detection on dual-channel wired systems
- 3 LEDs:
  - Supply voltage
  - Relays K1 and K2
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type terminals or plug-in terminals

## Applications



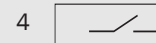
## Ordering information

- Supply voltage: 24 V DC
- Reset/restart: Automatic

Connection type	Type	Part no.
Screw-type terminals	UE43-4AR2D2	6034772
Plug-in terminals	UE43-4AR3D2	6034775



- For safety switches



N

Further information	Page
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→ Dimensional drawings	N-34
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## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE43-4AR2D2	UE43-4AR3D2
Supply voltage	24 V DC	
Safety related parameters		
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
B <sub>10d</sub> parameter	3 x 10 <sup>5</sup> switching cycles (AC-15, 230 V, I = 5 A), 2 x 10 <sup>6</sup> switching cycles (DC-15, 230 V, I = 2 A), 7 x 10 <sup>6</sup> switching cycles (DC-13, 24 V, I = 1 A)	
PFHd (mean probability of a dangerous failure per hour)	1.30 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Stop category	0 (EN 60204)	
Voltage supply	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)	
Supply voltage	A1, A2 24 V DC (20.4 V DC ... 26.4 V DC)	
Power consumption	3.6 VA, 2.1 W	
Residual ripple	2.4 V <sub>pp</sub> <sup>1)</sup>	

<sup>1)</sup> In DC operation, within the limits of V<sub>S</sub>

### Control voltage S11

Type	UE43-4AR2D2	UE43-4AR3D2
Control voltage	24 V DC (19.2 V DC ... 40 V DC)	
Control current	25 mA (max. 100 mA)	
Fuse	8 A gG, with tripping characteristics B or C	
Reset time	Max. 350 ms (S34)	
Galvanized decoupling	-	

### Input circuits Y12, Y22, Y31

Type	UE43-4AR2D2	UE43-4AR3D2
Switch-on time	350 ms	
Input voltage	24 V DC (19.2 V DC ... 26.6 V DC)	
Input current	S12, S52, S22, S34 25 mA, 100 mA	
Reset time	Max. 350 ms (S34)	
Switch-on time	Min. 350 ms	
Switch-off time	Min. 10 ms	
Cable resistance	< 70 Ohm	

N

## Electrical output circuits 13 - 14, 23 - 24, 33 - 34, 43 - 44

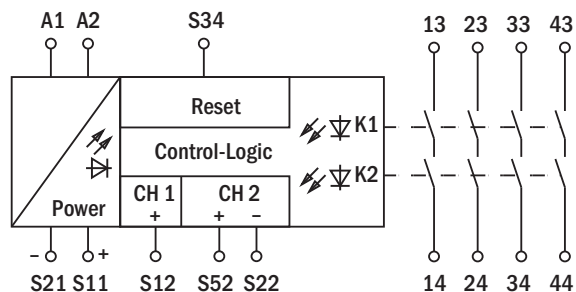
Type	UE43-4AR2D2	UE43-4AR3D2
Response time	Max. 10 ms <sup>1)</sup>	
Number of enable current (N/O) contacts	4, relevant for safety	
Number of signaling current (N/C) contacts	0	
Contact type	Positively driven	
Contact material	Silver alloy, gold flashed	
Switching voltage	5 V AC ... 300 V AC 5 V DC ... 250 V DC	
Switching current	10 mA ... 8 A	
Usage category	AC-15/DC-13	
Rated operating current (voltage)	5 A (230 V AC) 360 switching cycles/h 5 A (24 V DC) 3600 switching cycles/h	
Maximum switching frequency	3600/h	
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles	
Electrical life (relay contacts)	1 x 10 <sup>6</sup> switching cycles	

<sup>1)</sup> K1/K2

## Operating data

Type	UE43-4AR2D2	UE43-4AR3D2
Rated impulse withstand voltage $U_{imp}$	4 kV	
Overvoltage category	III	
Contamination rating		
External	3	
Internal	2	
Standard	EN 50178	
Rated insulation voltage $U_i$	300 V AC	
Test voltage	2 kV (50 Hz) EN 60439-1	
Enclosure rating		
Clamps	IP 20	
Housing	IP 40	
Interference emission	DIN EN 61000-6-4	
Interference resistance	EN 61000-6-2	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +75 °C	
Connection type	Screw-type terminals	Plug-in terminals
Conductor cross-section		
Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>	
Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm	
Weight	0.21 kg	

## Internal circuitry



### Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain open. If the connected sensor is not activated or the protective field of the connected electro-sensitive protective equipment (ESPE) is not broken (i.e., the input circuits are closed), then the normally open contacts close

immediately in automatic reset (LED K1 and K2 illuminate). The activation of the sensor or incursion into the protective field of the non-contact safety device (open state of one of the two input circuits) affects the opening of the normally open contacts (LED K1 and K2 off).

### External device monitoring (EDM)

The UE43-4AR unit can take over external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts. Connecting the EDM contacts between S11 and S34 replaces the wire link.

### Automatic reset

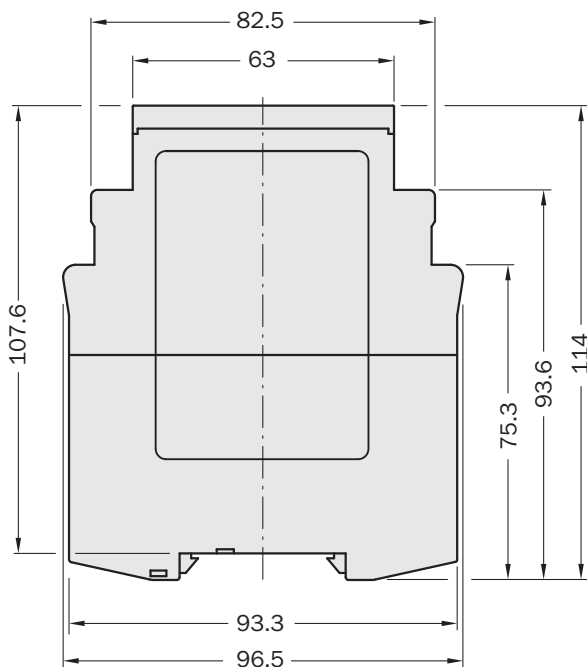
S11 - S34 must be linked.

### Cross-circuit detection

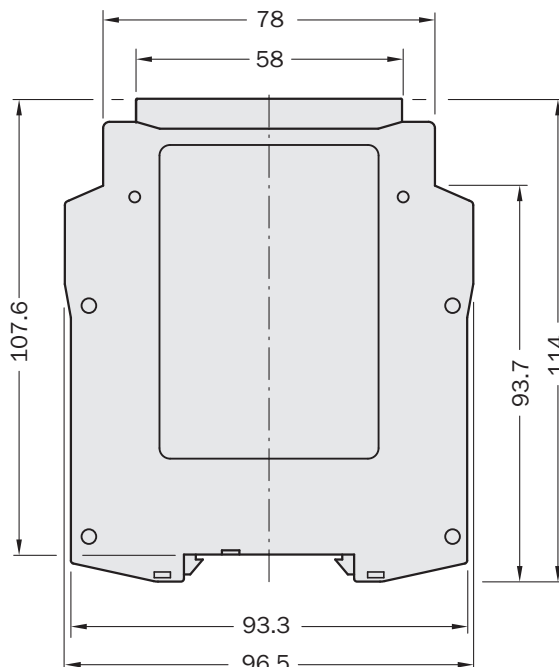
Cross-circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

## Dimensional drawings

### Screw-type terminals



### Plug-in terminals



Dimensions in mm

N

## Technical data overview

Category	Category 4 (EN ISO 13849) <sup>1)</sup> , Category 3 (EN ISO 13849) <sup>2)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup> , PL d (EN ISO 13849) <sup>2)</sup>
Number of enable current contacts	2
Number of signaling current contacts	0
Number of on-delayed contacts	1
Input circuit	Single- or dual-channel
Housing width	22.5 mm

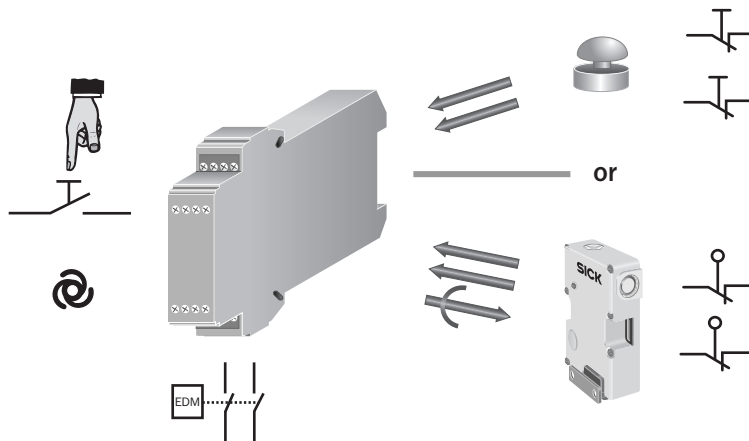
<sup>1)</sup> For contacts 13/14, 23/24

<sup>2)</sup> For time contacts 37/38

## Product description

- Cross-circuit detection on dual-channel wired systems
- Outputs:
  - 2 normally open contacts
  - 1 normally open contact with on-delay, adjustable from 0.15 ... 3 sec or 1.5 ... 30 sec
- 3 LEDs:
  - Supply voltage
  - Relays K1/K2 (without delay) and relays K3/K4 (off-delayed)
- Manual reset
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type terminals or plug-in terminals

## Applications

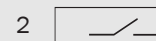


## Ordering information

Connection type	On-delay time	Type	Part no.
Screw-type terminals	0.15 s ... 3 s	UE44-3SL2D33	6024907
	1.5 s ... 30 s	UE44-3SL2D330	6024909
Plug-in terminals	0.15 s ... 3 s	UE44-3SL3D33	6024908
	1.5 s ... 30 s	UE44-3SL3D330	6024910



- For emergency stop pushbuttons
- For safety switches
- For safety switches with mechanical locking



Further information	Page
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→ Dimensional drawings	N-38
→ Connection diagrams	N-39
→ Systematic safety	A-0
→ Services	B-0

# Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## General system data

Type	UE44-3SL2D33	UE44-3SL2D330	UE44-3SL3D33	UE44-3SL3D330
<b>Safety related parameters</b>				
Safety integrity level	SILCL3 (IEC 62061) <sup>1)</sup> , SILCL2 (IEC 62061) <sup>2)</sup>			
Category	Category 4 (EN ISO 13849) <sup>1)</sup> , category 3 (EN ISO 13849) <sup>2)</sup>			
Performance level	PL e (EN ISO 13849) <sup>1)</sup> , PL d (EN ISO 13849) <sup>2)</sup>			
B <sub>10d</sub> parameter	4 x 10 <sup>5</sup> switching cycles (with maximum load)			
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849) <sup>1)</sup> , 2.0 x 10 <sup>-8</sup> (EN ISO 13849) <sup>2)</sup>			
T <sub>M</sub> (Mission Time)	5 years (EN ISO 13849)			
Stop category	0 (EN 60204)			
Voltage supply	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)			
Supply voltage	A1, A2 24 V DC (20.4 V DC ... 26.4 V DC)			
Power consumption	1.8 W			
Residual ripple	2.4 V <sub>pp</sub> <sup>3)</sup>			

<sup>1)</sup> For contacts 13/14, 23/24

<sup>2)</sup> For time contacts 37/38

<sup>3)</sup> In DC operation, within the limits of V<sub>S</sub>

## Control voltage S11, S21, S33

Type	UE44-3SL2D33	UE44-3SL2D330	UE44-3SL3D33	UE44-3SL3D330
Control voltage	22 V DC			
Control current	60 mA			
Short-circuit current	2200 mA, between S11 and A2			
Fuse	PTC resistor			
Reaction time by cross connection	2 s			
Galvanized decoupling	- (between A1, A2 and Y11, Y21, PE)			

## Input circuits S12, S31, S34, S35

Type	UE44-3SL2D33	UE44-3SL2D330	UE44-3SL3D33	UE44-3SL3D330
Input current				
S12, S31	25 mA ... 100 mA			
S34, S35	40 mA ... 50 mA			
Reset time				
Manual	Max. 30 ms (S34)			
Automatic	Max. 750 ms (S35)			
Activation time of reset button	250 ms			
Synchronous time monitoring	500 ms			
Cable resistance	< 85 Ohm			

N



## Electrical output circuits 13 - 14, 23 - 24, 37 - 38

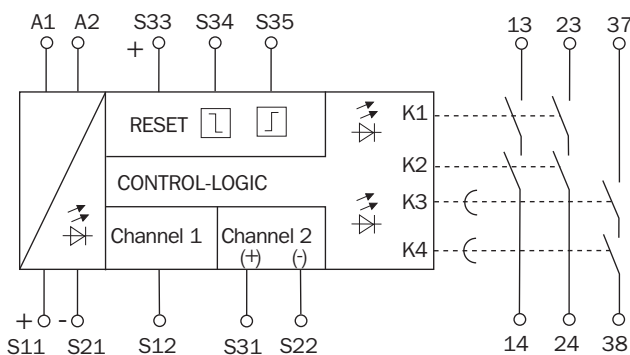
Type	UE44-3SL2D33	UE44-3SL2D330	UE44-3SL3D33	UE44-3SL3D330
Response time	25 ms <sup>1)</sup>			
On-delay time	0.15 s ... 3 s	1.5 s ... 30 s	0.15 s ... 3 s	1.5 s ... 30 s
Number of enable current (N/O) contacts	2, category 4			
Number of on-delayed N/O contacts	1, category 3			
Contact type	Positively driven			
Contact material	Silver alloy, gold flashed			
Switching voltage	10 V AC ... 230 V AC 10 V DC ... 30 V DC			
Switching current	10 mA ... 6 A 12 A			
<b>Total current</b>				
Usage category	AC-15/DC-13			
Rated operating current (voltage)	4 A (230 V AC) 3600 switching cycles/h 5 A (24 V DC) 360 switching cycles/h 3 A (24 V DC) 3600 switching cycles/h			
Maximum switching frequency	3600/h			
Mechanical life (relay contacts)	5 x 10 <sup>6</sup> switching cycles			
Electrical life (relay contacts)	2 x 10 <sup>6</sup> switching cycles			

<sup>1)</sup> K1/K2

## Operating data

Type	UE44-3SL2D33	UE44-3SL2D330	UE44-3SL3D33	UE44-3SL3D330
Rated impulse withstand voltage U <sub>imp</sub>	4 kV			
Overvoltage category	III			
Contamination rating				
External	3			
Internal	2			
Standard	EN 50178			
Rated insulation voltage U <sub>i</sub>	300 V AC			
Test voltage	2 kV (50 Hz) EN 60439-1			
Enclosure rating				
Clamps	IP 20			
Housing	IP 40			
Interference emission	EN 60947-1 02/99			
Interference resistance	EN 60947-1 02/99			
Ambient operating temperature	-25 °C ... +55 °C			
Storage temperature	-25 °C ... +75 °C			
Connection type	Screw-type terminals		Plug-in terminals	
Conductor cross-section				
Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>			
Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>			
Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>			
Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>			
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm			
Weight	0.2 kg			

## Internal circuitry



### Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts (13 - 14 / 23 - 24) remain open. After completion of the on-delay set on the relay, the delay circuit (37 - 38) closes, and the LED K3/K4 illuminates. If the connected sensor is not activated (i.e., the input circuits are closed), the normally open contacts (13 - 14 / 23 - 24) close immediately during automatic reset, the LED K1/K2 illuminates, and the delay circuit (37 - 38) opens (LED K3/K4 off). In the case of manual reset, this only occurs after pressing and releasing the reset button.

The activation of the sensor (opening of one or both input circuits) affects the opening of both normally open contacts (13 - 14 / 23 - 24), with LEDs K1/K2 being off, and a time delayed

closing of the third circuit (37 - 38), with LED K3/K4 illuminating.

### External device monitoring (EDM)

The unit can take over external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

### Manual reset

For manual resetting, a pushbutton is to be connected between 24 V DC supply and terminal S34. This reset is monitored. For applications with mechanical locking safety switches, only channel 2 must be closed during manual reset.

### Automatic reset

For automatic resetting, S12 - S35 must be linked. For applications with mechanical locking safety switches, only channel 1 must be closed during automatic reset.

### Cross-circuit detection

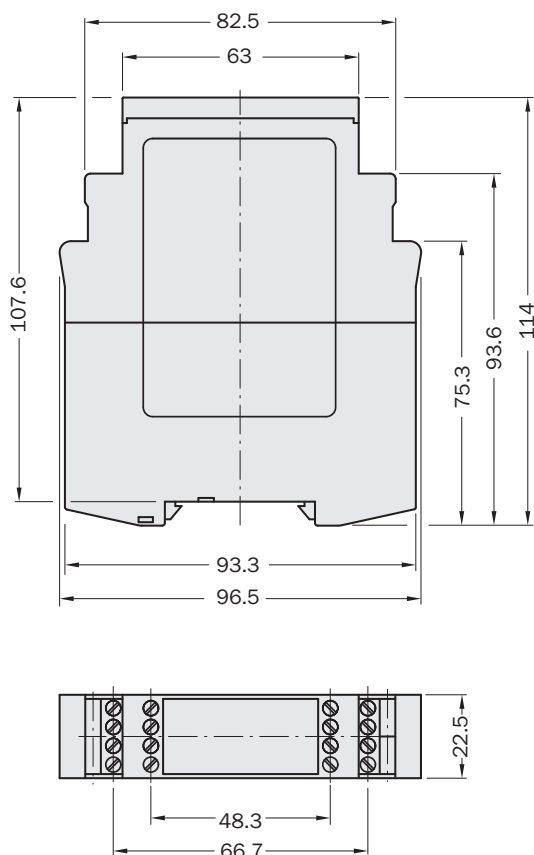
Cross-circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

### Monitoring of synchronization

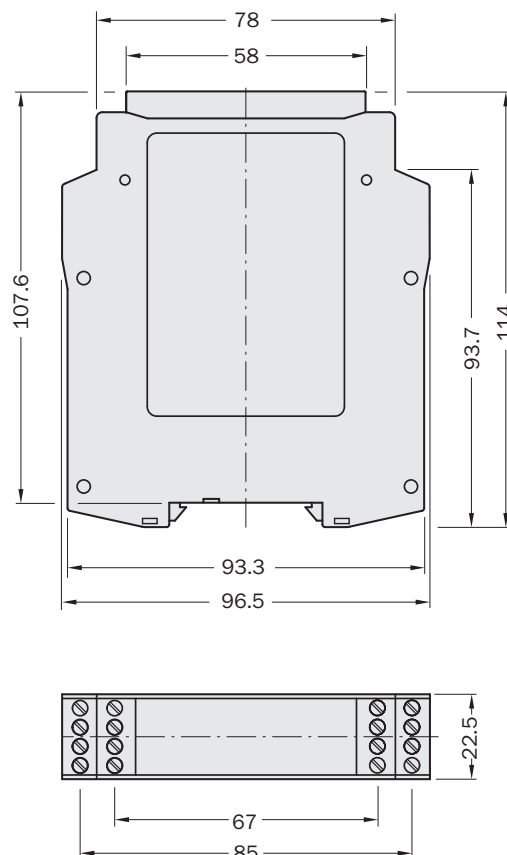
Only if input 2 closes no later than 0.5 sec after input 1, do the output circuits close. If input 2 closes before input 1, the synchronization monitoring will not be affected, and the output circuits will close. This monitoring only takes place in automatic reset.

## Dimensional drawings

### Screw-type terminals



### Plug-in terminals



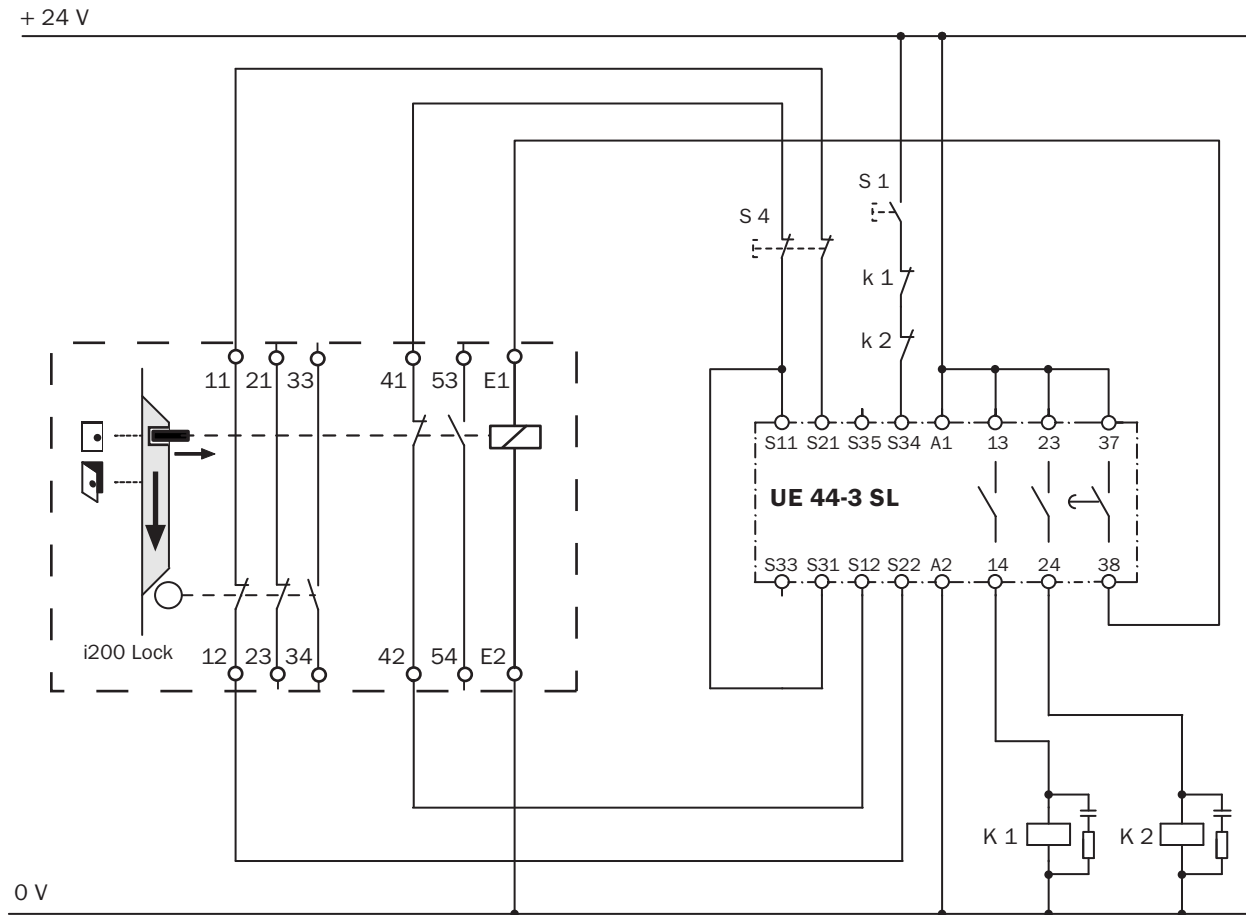
Dimensions in mm

N

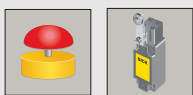
## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

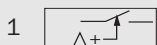
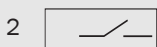
### i200 Lock safety locking device connected to UE44-3SL safety relay



Operating mode: with manual reset and external device monitoring (EDM)



- For emergency stop pushbuttons
- For safety switches



## Technical data overview

Category	Category 4 (EN ISO 13849) <sup>1)</sup> , Category 3 (EN ISO 13849) <sup>2)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup> , PL d (EN ISO 13849) <sup>2)</sup>
Number of enable current contacts	2
Number of signaling current contacts	0
Number of off-delayed contacts	1
Input circuit	Single- or dual-channel
Housing width	22.5 mm

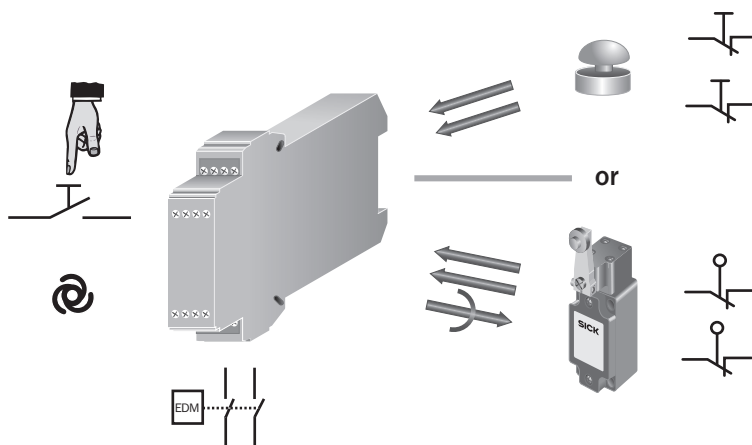
<sup>1)</sup> For contacts 13/14, 23/24

<sup>2)</sup> For time contacts 37/38

## Product description

- Cross-circuit detection on dual-channel wired systems
- Outputs:
  - 2 normally open contacts
  - 1 normally open contact with off-delay, adjustable from 0.15 ... 3 sec or 1.5 ... 30 sec
- 3 LEDs:
  - Supply voltage
  - Relays K1/K2 (without delay) and relays K3/K4 (off-delayed)
- Manual reset
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type terminals or plug-in terminals

## Applications



## Ordering information

Connection type	Off-delay time	Type	Part no.
Screw-type terminals	0.15 s ... 3 s	UE45-3S12D33	6024911
	1.5 s ... 30 s	UE45-3S12D330	6024913
Plug-in terminals	0.15 s ... 3 s	UE45-3S13D33	6024912
	1.5 s ... 30 s	UE45-3S13D330	6024914

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→ Systematic safety	A-0
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N

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE45-3S12D33	UE45-3S12D330	UE45-3S13D33	UE45-3S13D330
<b>Safety related parameters</b>				
<b>Safety integrity level</b>	SILCL3 (IEC 62061) <sup>1)</sup> , SILCL2 (IEC 62061) <sup>2)</sup>			
<b>Category</b>	Category 4 (EN ISO 13849) <sup>1)</sup> , category 3 (EN ISO 13849) <sup>2)</sup>			
<b>Performance level</b>	PL e (EN ISO 13849) <sup>1)</sup> , PL d (EN ISO 13849) <sup>2)</sup>			
<b>B<sub>10d</sub> parameter</b>	4 x 10 <sup>5</sup> switching cycles (with maximum load)			
<b>PFHd (mean probability of a dangerous failure per hour)</b>	3.0 x 10 <sup>-8</sup> (EN ISO 13849) <sup>1)</sup> , 2.0 x 10 <sup>-8</sup> (EN ISO 13849) <sup>2)</sup>			
<b>T<sub>M</sub> (Mission Time)</b>	20 years (EN ISO 13849)			
<b>Stop category</b>	1, 0 (EN 60204)			
<b>Voltage supply</b>	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)			
<b>Supply voltage</b>	A1, A2 24 V DC (20.4 V DC ... 26.4 V DC)			
<b>Power consumption</b>	2.6 W			
<b>Residual ripple</b>	2.4 V <sub>pp</sub> <sup>3)</sup>			

<sup>1)</sup> For contacts 13/14, 23/24

<sup>2)</sup> For time contacts 37/38

<sup>3)</sup> In DC operation, within the limits of V<sub>S</sub>

### Control voltage S11, S21, S33

Type	UE45-3S12D33	UE45-3S12D330	UE45-3S13D33	UE45-3S13D330
<b>Control voltage</b>	24 V DC			
<b>Control current</b>	60 mA			
<b>Short-circuit current</b>	2200 mA, between S11 and A2			
<b>Fuse</b>	PTC resistor			
<b>Reaction time by cross connection</b>	2 s			
<b>Galvanized decoupling</b>	- (between A1, A2 and S11, S21)			

### Input circuits S12, S31, S34, S35

Type	UE45-3S12D33	UE45-3S12D330	UE45-3S13D33	UE45-3S13D330
<b>Input current</b>				
<b>S12, S31</b>	25 mA ... 100 mA			
<b>S34, S35</b>	40 mA ... 50 mA			
<b>Reset time</b>				
<b>Manual</b>	Max. 30 ms (S34)			
<b>Automatic</b>	Max. 600 ms (S35)			
<b>Activation time of reset button</b>	200 ms			
<b>Synchronous time monitoring</b>	500 ms			
<b>Cable resistance</b>	< 85 Ohm			

Electrical output circuits 13 - 14, 23 - 24, 37 - 38

Type	UE45-3S12D33	UE45-3S12D330	UE45-3S13D33	UE45-3S13D330
Response time	25 ms <sup>1)</sup>			
Off-delay time	0.15 s ... 3 s	1.5 s ... 30 s	0.15 s ... 3 s	1.5 s ... 30 s
Number of enable current (N/O) contacts	2, category 4			
Number of off-delayed N/O contacts	1, category 3			
Contact type	Positively driven			
Contact material	Silver alloy, gold flashed			
Switching voltage	10 V AC ... 230 V AC 10 V DC ... 30 V DC			
Switching current	10 mA ... 6 A			
<b>Total current</b>	12 A			
Usage category	AC-15/DC-13			
Rated operating current (voltage)	4 A (230 V AC) 3600 switching cycles/h 5 A (24 V DC) 360 switching cycles/h 3 A (24 V DC) 3600 switching cycles/h			
Maximum switching frequency	3600/h			
Mechanical life (relay contacts)	5 x 10 <sup>6</sup> switching cycles			
Electrical life (relay contacts)	2 x 10 <sup>6</sup> switching cycles			

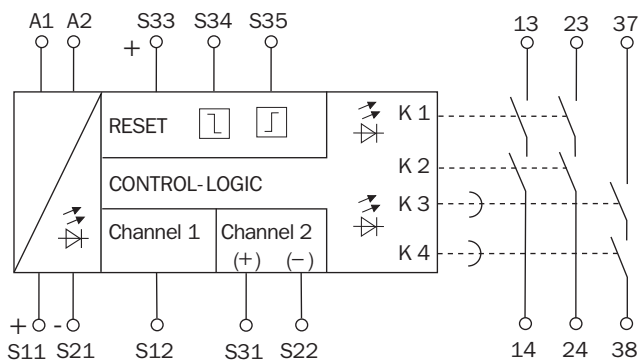
<sup>1)</sup> K1/K2

Operating data

Type	UE45-3S12D33	UE45-3S12D330	UE45-3S13D33	UE45-3S13D330
Rated impulse withstand voltage U <sub>imp</sub>	4 kV			
Overtoltage category	III			
Contamination rating				
<b>External</b>	3			
<b>Internal</b>	2			
<b>Standard</b>	EN 50178			
Rated insulation voltage U <sub>i</sub>	300 V AC			
Test voltage	2 kV (50 Hz) EN 60439-1			
Enclosure rating				
<b>Clamps</b>	IP 20			
<b>Housing</b>	IP 40			
Interference emission	EN 60947-1 02/99			
Interference resistance	EN 60947-1 02/99			
Ambient operating temperature	-25 °C ... +55 °C			
Storage temperature	-25 °C ... +75 °C			
Connection type	Screw-type terminals		Plug-in terminals	
Conductor cross-section				
<b>Single wire (2x, same cross-section)</b>	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>			
<b>Single wire (1x)</b>	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>			
<b>Fine wire with ferrules (2x, same cross-section)</b>	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>			
<b>Fine wire with ferrules (1x)</b>	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>			
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm			
Weight	0.2 kg			

N

## Internal circuitry



### Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain open. If the connected sensor is not activated (i.e., the input circuits are closed), the normally open contacts close immediately during automatic resetting; LED K1/K2 and K3/K4 illuminate. In the case of manual resetting, this only occurs after pressing and releasing the reset button. The activation of the sensor (opening of one or both input circuits) affects the opening of both normally open contacts (13 - 14 / 23 - 24) immediately, and a time delayed opening of the

third circuit (37 - 38), with LED K1/K2 immediately going off and K3/K4 going off later.

### External device monitoring (EDM)

The unit can take over external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

### Manual reset

For manual resetting, a pushbutton must be connected to terminals S33 - S34. This reset is monitored.

### Automatic reset

For automatic resetting, S33 - S35 must be linked.

### Cross-circuit detection

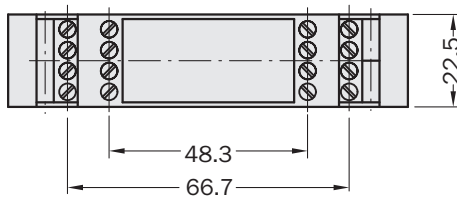
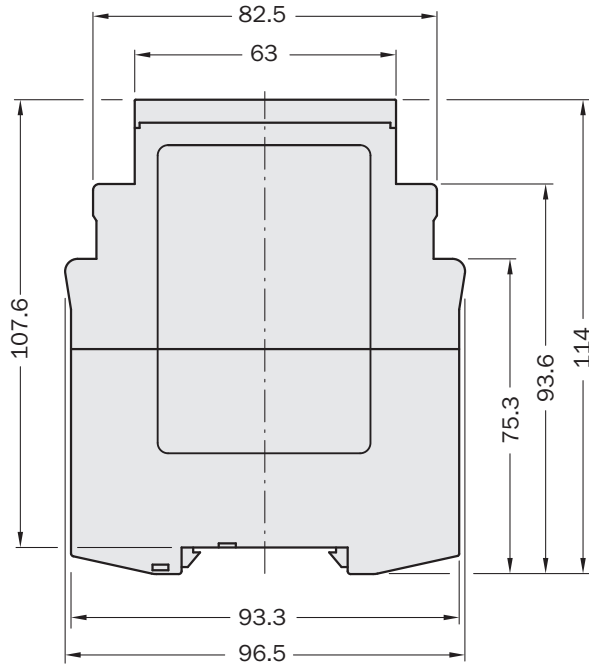
Cross-circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

### Monitoring of synchronization

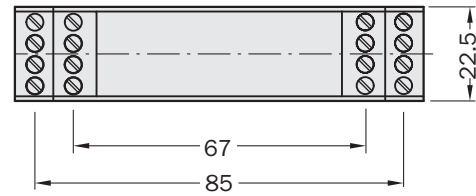
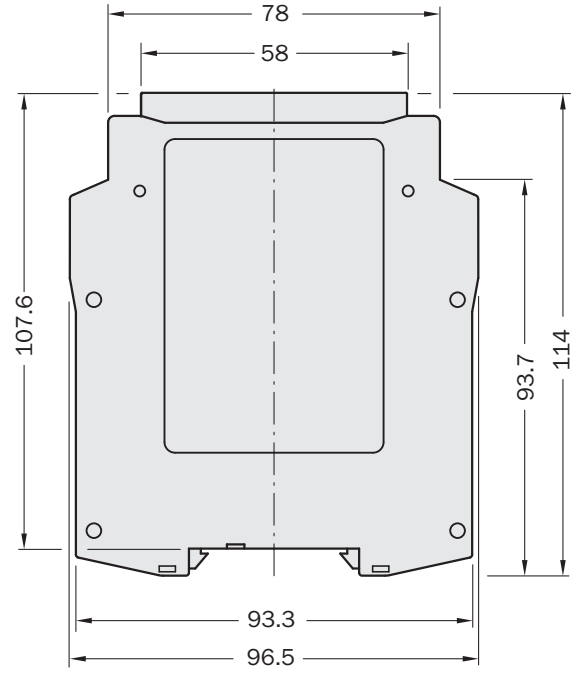
Only if input 2 closes no later than 0.5 sec after input 1, do the output circuits close. If input 2 closes before input 1, the synchronization monitoring will not be affected, and the output circuits will close. This monitoring only takes place in automatic reset.

# Dimensional drawings

## Screw-type terminals



## Plug-in terminals



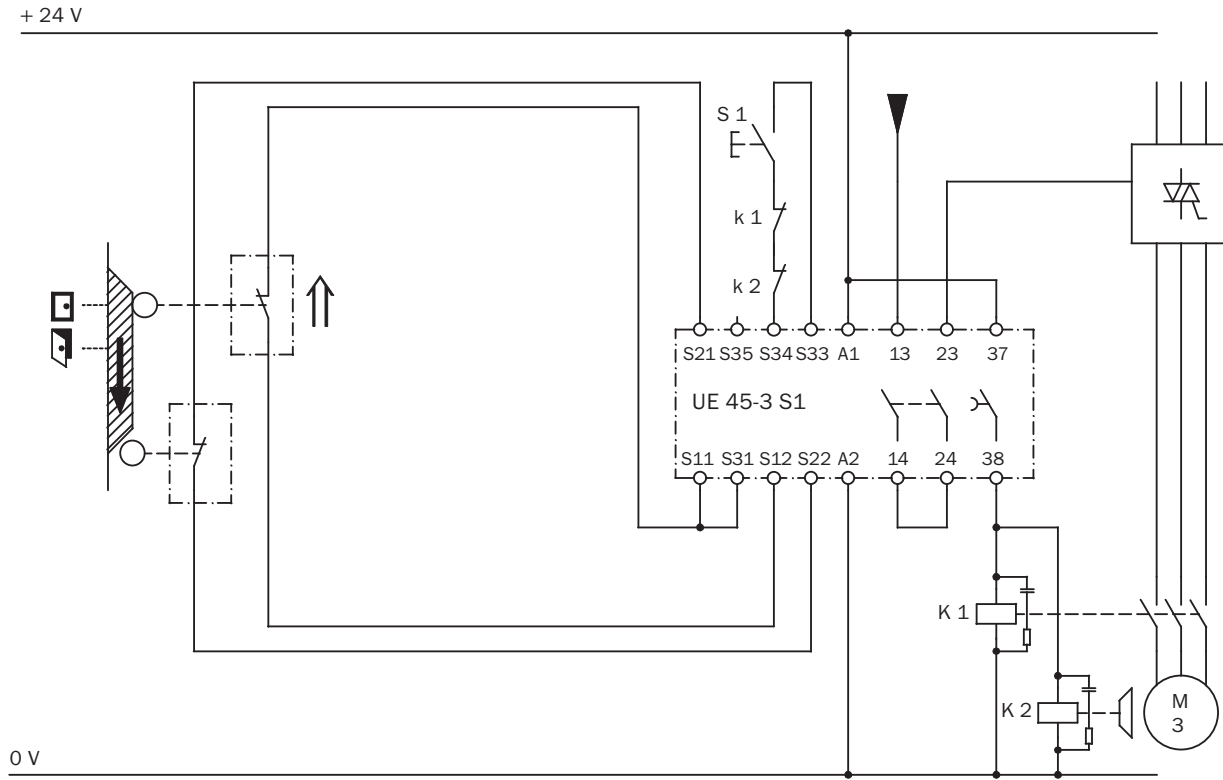
Dimensions in mm



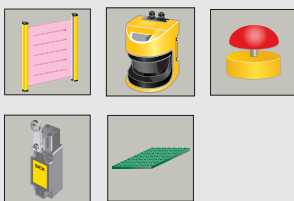
## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

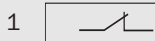
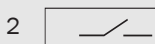
### Two safety switches connected to UE45-3S1 safety relay



Operating mode: with manual reset and external device monitoring (EDM)



- For emergency stop pushbuttons
- For safety switches
- For safety laser scanners
- For safety light curtains
- For non-contact safety switches
- For pressure sensitive mats in accordance with EN 1760 using 4-wire technology



N

Further information	Page
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## Technical data overview

Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of enable current contacts	2
Number of signaling current contacts	1
Input circuit	Single- or dual-channel
Housing width	22.5 mm

## Product description

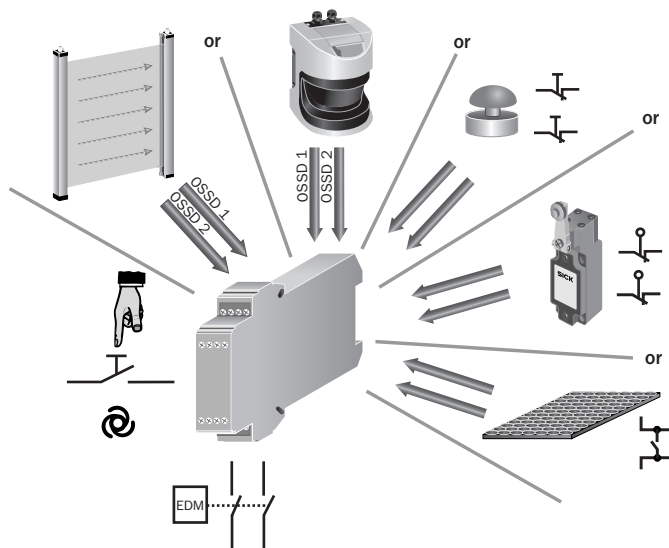
- Cross-circuit detection on dual-channel wired systems
- 3 LEDs:
  - Supply voltage
  - Relays K1 and K2
- Manual reset
- Automatic reset
- Additional outputs with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type terminals or removable terminals

## In-system added value

- Devices employing monitored semiconductor outputs (OSSD), such as:
- C2000
  - M2000
  - C4000
  - S3000
  - M4000
  - T4000 Direct

→ For more combinations, see annex

## Applications



## Ordering information

Connection type	Type	Part no.
Screw-type terminals	UE48-20S2D2	6024915
Plug-in terminals	UE48-20S3D2	6024916

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE48-20S2D2	UE48-20S3D2
<b>Safety related parameters</b>		
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
B <sub>10d</sub> parameter	1.26 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 1.5 A), 5.9 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.75 A), 4.35 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2.5 A), 1 x 10 <sup>7</sup> switching cycles (DC-13, 24 V, I = 0.63 A)	
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Stop category	0 (EN 60204)	
Voltage supply	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)	
Supply voltage	A1, A2 24 V AC (20.4 V AC ... 26.4 V AC) 24 V DC (20.4 V DC ... 26.4 V DC)	
Power consumption	4.6 VA, 2.1 W	
Residual ripple	2.4 V <sub>pp</sub> <sup>1)</sup>	
Nominal frequency	50 Hz ... 60 Hz <sup>2)</sup>	

<sup>1)</sup> In DC operation, within the limits of V<sub>S</sub>

<sup>2)</sup> In AC operation

### Control voltage S11, S21, S33

Type	UE48-20S2D2	UE48-20S3D2
Control voltage	17.4 V DC ... 22 V DC	
Control current	40 mA ... 100 mA	
Short-circuit current	300 mA, between S33 / S11 and S21	
Fuse	Electronic fuse	
Reaction time by cross connection	50 ms	
Reaction time upon detection of cross connection	50 ms	
Galvanized decoupling	- (between A1, A2 and S11, S21, S33)	

Input circuits S12, S22, S31, S34, S35

Type	UE48-20S2D2	UE48-20S3D2
Input voltage	HIGH	17.4 V DC ... 26.4 V DC
	LOW	-3 V DC ... 5 V DC
Input current	S12, S22, S31	40 mA ... 100 mA
	S34, S35	5 mA ... 50 mA
Reset time	Manual	Max. 40 ms (S34)
	Automatic	Max. 80 ms (S12, S35)
Activation time of reset button		50 ms
Switch-off time		Min. 7 ms
Test pulse width		Max. 1000 µs
Test pulse rate		10 Hz
Cable resistance		< 35 Ohm

Electrical output circuits 13 - 14, 23 - 24, 31 - 32, 33 - 34

Type	UE48-20S2D2	UE48-20S3D2
Response time		25 ms <sup>1)</sup>
Opening time		70 ms ... 130 ms
Number of enable current (N/O) contacts		2, relevant for safety
Number of signaling current (N/C) contacts		1, not safety-relevant
Contact type		Positively driven
Contact material		Silver alloy, gold flashed
Switching voltage		10 V AC ... 230 V AC
		10 V DC ... 30 V DC
Switching current		10 mA ... 6 A
	Total current	12 A
Usage category		AC-15/DC-13
Rated operating current (voltage)		4 A (230 V AC) 360 switching cycles/h 3 A (230 V AC) 3600 switching cycles/h 4 A (24 V DC) 360 switching cycles/h 2.5 A (24 V DC) 3600 switching cycles/h
Maximum switching frequency		3600/h
Mechanical life (relay contacts)		1 x 10 <sup>7</sup> switching cycles
Electrical life (relay contacts)		2 x 10 <sup>6</sup> switching cycles

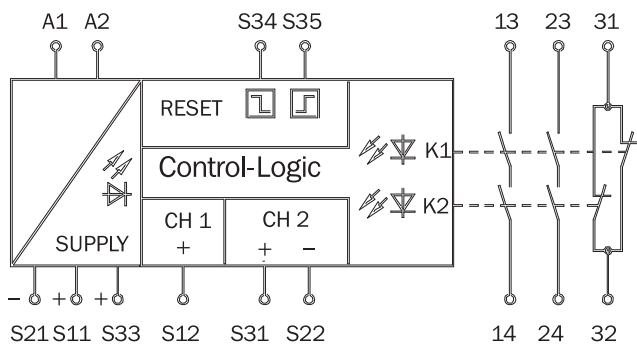
<sup>1)</sup> K1/K2



## Operating data

Type	UE48-20S2D2	UE48-20S3D2
Rated impulse withstand voltage $U_{imp}$	4 kV	
Overvoltage category	III	
Contamination rating		
External	3	
Internal	2	
Standard	EN 50178	
Rated insulation voltage $U_i$	300 V AC	
Test voltage	2 kV (50 Hz) EN 60439-1	
Enclosure rating		
Clamps	IP 20	
Housing	IP 40	
Interference emission	DIN EN 61000-6-4	
Interference resistance	EN 61000-6-2	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +75 °C	
Connection type	Screw-type terminals	Plug-in terminals
Conductor cross-section		
Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>	
Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm	
Weight	0.2 kg	

## Internal circuitry



### Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain open. If the connected sensor is not activated or the protective field of the connected electro-sensitive protective equipment (ESPE) is not broken (i.e., the input circuits are closed), then the normally open contacts close immediately in automatic reset; LEDs K1 and K2 illuminate. In the case of manual resetting, this only occurs after pressing and

releasing the reset button. The activation of the sensor or incursion into the protective field of the non-contact safety device (open state of one of the two input circuits) affects the opening of the normally open contacts (LED K1 and K2 off).

### External device monitoring (EDM)

The unit can take over external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

### Manual reset

For manual resetting, a pushbutton must be connected to terminals S33 - S34. This reset is monitored.

### Automatic reset

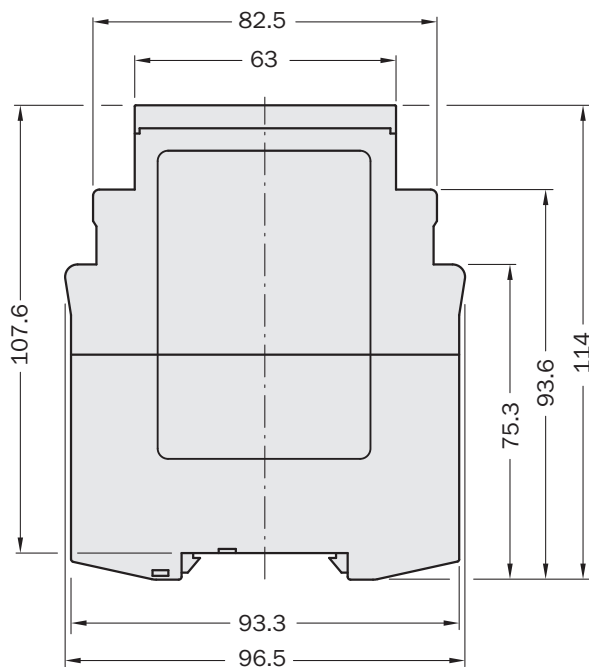
For ESPE's: S33 - S35 must be linked; for applications with potential free contacts on the input circuit, S12 - S35 must be linked.

### Cross-circuit detection

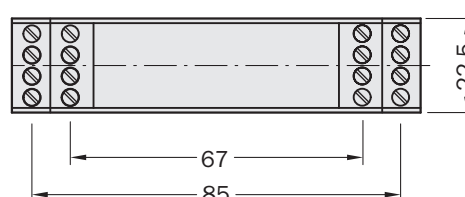
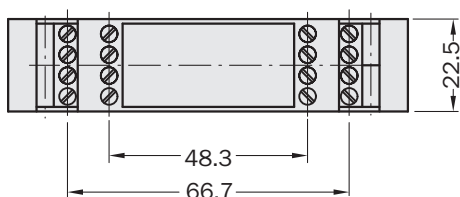
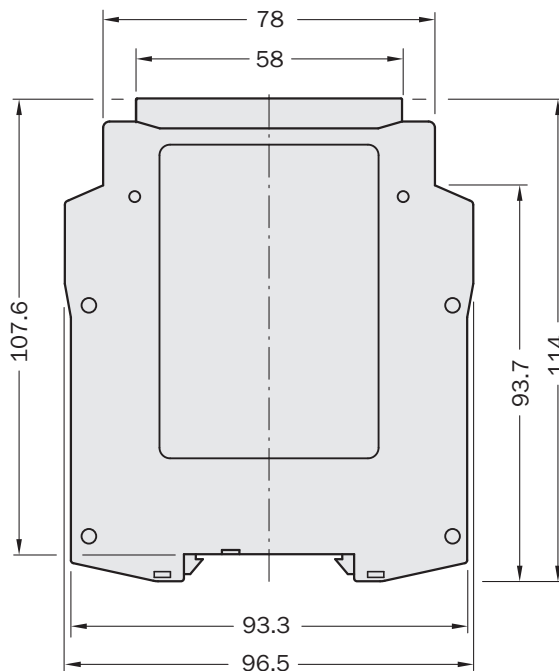
Cross-circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

## Dimensional drawings

### Screw-type terminals



### Plug-in terminals



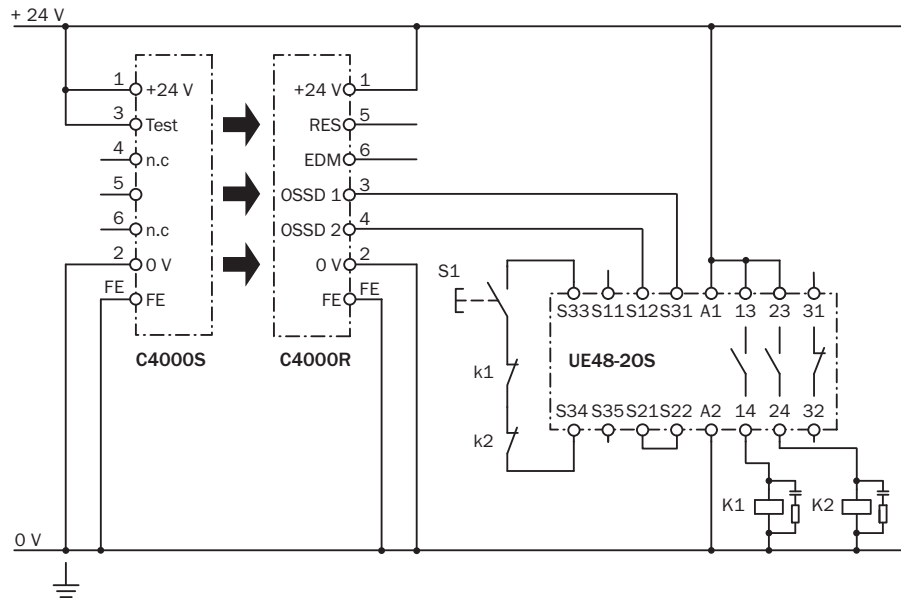
Dimensions in mm

N

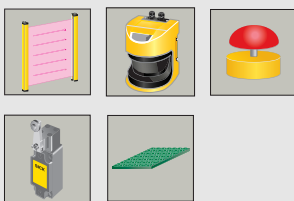
## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

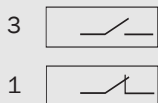
### C4000 Basic safety light curtain connected to UE48-20S safety relay



Operating mode: with manual reset and external device monitoring (EDM)



- For emergency stop pushbuttons
- For safety switches
- For safety laser scanners
- For safety light curtains
- For non-contact safety switches
- For pressure sensitive mats in accordance with EN 1760 using 4-wire technology



Further information	Page
→ Internal circuitry	N-55
→ Dimensional drawings	N-56
→ Systematic safety	A-0
→ Services	B-0

## Technical data overview

Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
Number of enable current contacts	3
Number of signaling current contacts	0
Input circuit	Single- or dual-channel
Housing width	22.5 mm

## Product description

- Cross-circuit detection on dual-channel wired systems
- 3 LEDs:
  - Supply voltage
  - Relays K1 and K2
- Manual reset
- Automatic reset
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- External device monitoring (EDM)
- Screw-type terminals or removable terminals

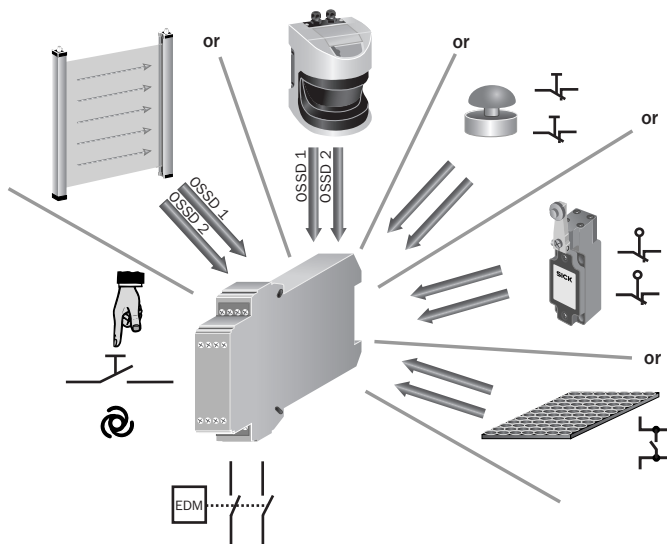
## In-system added value

Devices employing monitored semiconductor outputs (OSSD), such as:

- C2000
- M2000
- C4000
- S3000
- M4000
- T4000 Direct

→ For more combinations, see annex

## Applications



## Ordering information

Connection type	Type	Part no.
Screw-type terminals	UE48-30S2D2	6025089
Plug-in terminals	UE48-30S3D2	6025097



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE48-30S2D2	UE48-30S3D2
<b>Safety related parameters</b>		
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
B <sub>10d</sub> parameter	1.26 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 1.5 A), 5.9 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.75 A), 4.35 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2.5 A), 1 x 10 <sup>7</sup> switching cycles (DC-13, 24 V, I = 0.63 A)	
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Stop category	0 (EN 60204)	
Voltage supply	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)	
Supply voltage	A1, A2 24 V AC (20.4 V AC ... 26.4 V AC) 24 V DC (20.4 V DC ... 26.4 V DC)	
Power consumption	4.6 VA, 2.1 W	
Residual ripple	2.4 V <sub>pp</sub> <sup>1)</sup>	
Nominal frequency	50 Hz ... 60 Hz <sup>2)</sup>	

<sup>1)</sup> In DC operation, within the limits of V<sub>S</sub>

<sup>2)</sup> In AC operation

### Control voltage S11, S21

Type	UE48-30S2D2	UE48-30S3D2
Control voltage	17.4 V DC ... 22 V DC	
Control current	40 mA ... 100 mA	
Short-circuit current	300 mA, between S33 / S11 and S21	
Fuse	Electronic fuse	
Reaction time by cross connection	50 ms	
Reaction time upon detection of cross connection	50 ms	
Galvanized decoupling	- (between A1, A2 and S11, S21, S33)	

Input circuits S12, S22, S31, S34, S35

Type	UE48-30S2D2	UE48-30S3D2
Input voltage	HIGH	17.4 V DC ... 26.4 V DC
	LOW	-3 V DC ... 5 V DC
Input current	S12, S22, S31	40 mA ... 100 mA
	S34, S35	5 mA ... 50 mA
Reset time	Manual	Max. 40 ms (S34)
	Automatic	Max. 80 ms (S12, S35)
Activation time of reset button	50 ms	
Switch-off time	Min. 7 ms	
Test pulse width	Max. 1000 µs	
Test pulse rate	10 Hz	
Cable resistance	35 Ohm	

Electrical output circuits 13 - 14, 23 - 24, 33 - 34

Type	UE48-30S2D2	UE48-30S3D2
Response time	25 ms <sup>1)</sup>	
Opening time	70 ms ... 130 ms	
Number of enable current (N/O) contacts	3, relevant for safety	
Contact type	Positively driven	
Contact material	Silver alloy, gold flashed	
Switching voltage	10 V AC ... 230 V AC	
	10 V DC ... 30 V DC	
Switching current	10 mA ... 6 A	
	Total current	12 A
Usage category	AC-15/DC-13	
Rated operating current (voltage)	4 A (230 V AC) 360 switching cycles/h 3 A (230 V AC) 3600 switching cycles/h 4 A (24 V DC) 360 switching cycles/h 2.5 A (24 V DC) 3600 switching cycles/h	
Maximum switching frequency	3600/h	
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles	
Electrical life (relay contacts)	2 x 10 <sup>6</sup> switching cycles	

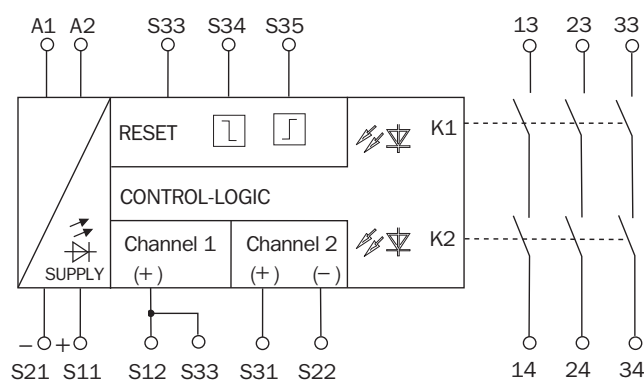
<sup>1)</sup> K1/K2



Operating data

Type	UE48-30S2D2	UE48-30S3D2
Rated impulse withstand voltage $U_{imp}$	4 kV	
Overvoltage category	III	
Contamination rating	External	3
	Internal	2
	Standard	EN 50178
Rated insulation voltage $U_i$	300 V AC	
Test voltage	2 kV (50 Hz) EN 60439-1	
Enclosure rating	Clamps	IP 20
	Housing	IP 40
Interference emission	DIN EN 61000-6-4	
Interference resistance	EN 61000-6-2	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +75 °C	
Connection type	Screw-type terminals	Plug-in terminals
Conductor cross-section	Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>
	Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
	Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>
	Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm	
Weight	0.2 kg	

Internal circuitry



Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain open. If the connected sensor is not activated or the protective field of the connected electro-sensitive protective equipment (ESPE) is not broken (i.e., the input circuits are closed), then the normally open contacts close immediately in automatic reset; LEDs K1 and K2 illuminate. In the case of manual resetting, this only occurs after pressing and

releasing the reset button. The activation of the sensor or incursion into the protective field of the non-contact safety device (open state of one of the two input circuits) affects the opening of the normally open contacts (LED K1 and K2 off).

External device monitoring (EDM)

The unit can take over external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

Manual reset

For manual resetting, a pushbutton must be connected to terminals S33 - S34. This reset is monitored.

Automatic reset

For ESPE's: S33 - S35 must be linked; for applications with potential free contacts on the input circuit, S12 - S35 must be linked.

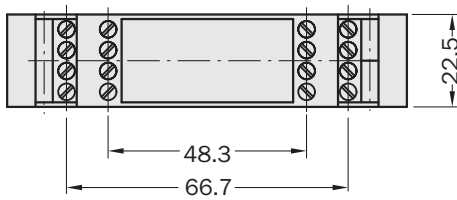
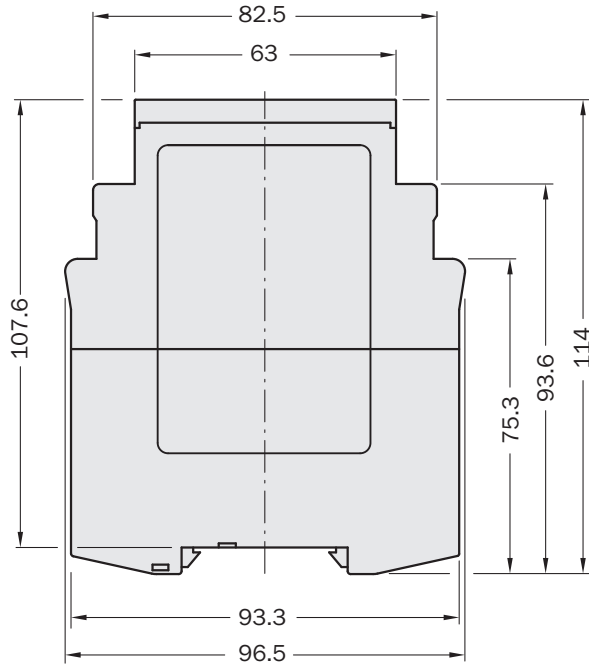
Cross-circuit detection

Cross-circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

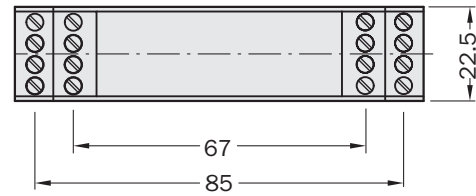
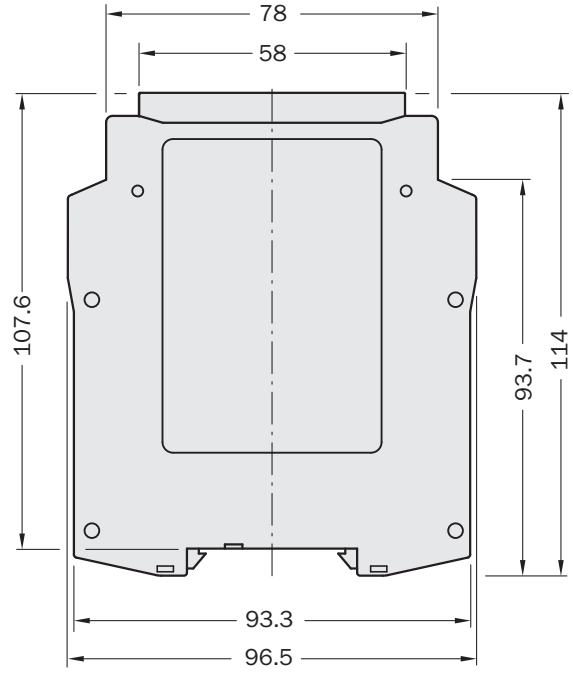


# Dimensional drawings

## Screw-type terminals



## Plug-in terminals



Dimensions in mm

## Technical data overview

Category	Category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup>
Number of enable current contacts	2
Number of signaling current contacts	0
Input circuit	Single- or dual-channel
Housing width	17.8 mm

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

## Product description

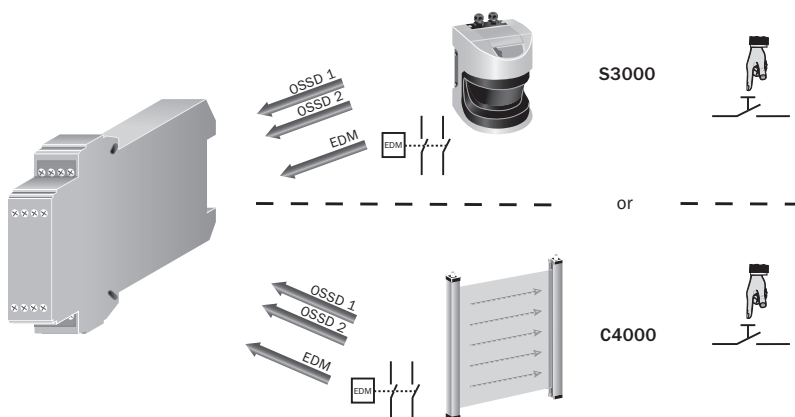
- NC contact for external device monitoring (EDM)
- 2 LEDs:
  - Relay K1
  - Relay K2
- Additional outputs available with the supplied cascading jumper (UE12-2FG only)
- Available with screw-type or plug-in terminals

## In-system added value

- Contact expansion module for electro-sensitive protective equipment (ESPE) with monitored semiconductor outputs, integral external device monitoring (EDM) and restart interlock, such as:
  - C4000
  - C/M2000
  - M4000
  - S3000
- Contact expansion module for safety systems with monitored semiconductor outputs, integral external device monitoring and restart interlock, such as:
  - Flexi Classic
  - Flexi Soft

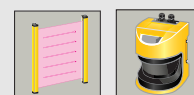
→ For more combinations, see annex

## Applications

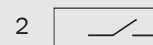


## Ordering information

Connection type	Type	Part no.
Screw-type terminals	UE10-2FG2D0	1043915
Plug-in terminals	UE10-2FG3D0	1043916
Screw-type terminals	UE12-2FG2D0	1043917
Plug-in terminals	UE12-2FG3D0	1043918



- For safety laser scanners
- For safety light curtains



Further information	Page
→ Technical specifications	N-58
→ Internal circuitry	N-59
→ Dimensional drawings	N-60
→ Connection diagrams	N-60
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE10-2FG2D0	UE10-2FG3D0	UE12-2FG2D0	UE12-2FG3D0
<b>Safety related parameters</b>				
Safety integrity level	SIL3 (IEC 61508) <sup>1)</sup> , SILCL3 (IEC 62061) <sup>1)</sup>			
Category	Category 4 (EN ISO 13849) <sup>1)</sup>			
Performance level	PL e (EN ISO 13849) <sup>1)</sup>			
B <sub>10d</sub> parameter	1 x 10 <sup>5</sup> switching cycles (AC-15, 230 V, I = 2 A), 2.5 x 10 <sup>5</sup> switching cycles (AC-15, 230 V, I = 1 A), 5.4 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 0.5 A), 1 x 10 <sup>7</sup> switching cycles (DC-13, 24 V, I ≤ 2 A)			
PFHd (mean probability of a dangerous failure per hour)	1.05 x 10 <sup>-9</sup> (EN ISO 13849)		1.58 x 10 <sup>-9</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)			
<b>Voltage supply</b>				
B1/A2, B2/A2				
PELV (Output circuit > 25 V AC / 60 V DC)				
PELV or SELV (Output circuit < 25 V AC / 60 V DC)				
<b>Residual ripple</b>				
2.4 V <sub>pp</sub> <sup>2)</sup>				

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

<sup>2)</sup> In DC operation, within the limits of V<sub>S</sub>

### Input circuits B1, B2

Type	UE10-2FG2D0	UE10-2FG3D0	UE12-2FG2D0	UE12-2FG3D0
Switch-on time	30 ms			
Input voltage	24 V DC (16.8 V DC ... 27.6 V DC)			
Input current	500 mA			
Reset time	Max. 30 ms			
Switch-on time	Min. 30 ms			
Switch-off time	Min. 10 ms			
Test pulse width	Max. 1 ms			

### Electrical output circuits 13 - 14, 23 - 24, Y1 - Y2

Type	UE10-2FG2D0	UE10-2FG3D0	UE12-2FG2D0	UE12-2FG3D0
Response time	Max. 10 ms			
Number of enable current (N/O) contacts	2, relevant for safety			
Number of contactor monitoring (N/C) contacts	1, external device monitoring			
Contact type	Positively driven			
Contact material	Silver alloy, gold flashed			
<b>Switching voltage</b>				
Enable current contact	10 V AC ... 250 V AC			
Contact monitoring contact	0.1 V AC/DC ... 60 V AC/DC			
<b>Switching current</b>				
Enable current contact	10 mA ... 6 A			
Contact monitoring contact	1 mA ... 300 mA			
Switching power	1500 VA, 200 W			
Usage category	AC-15/DC-13			
Rated operating current (voltage)	3 A (230 V AC) 4 A (24 V DC)			
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles			
Electrical life (relay contacts)	1 x 10 <sup>5</sup> switching cycles			

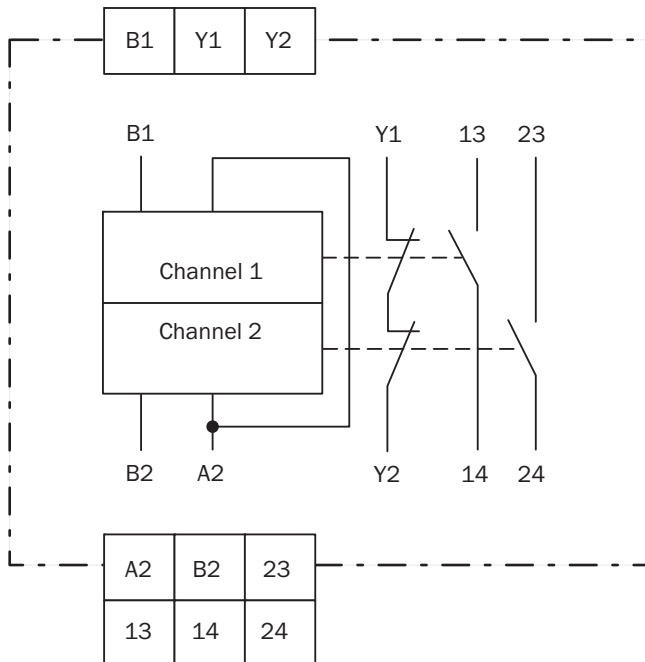


Operating data

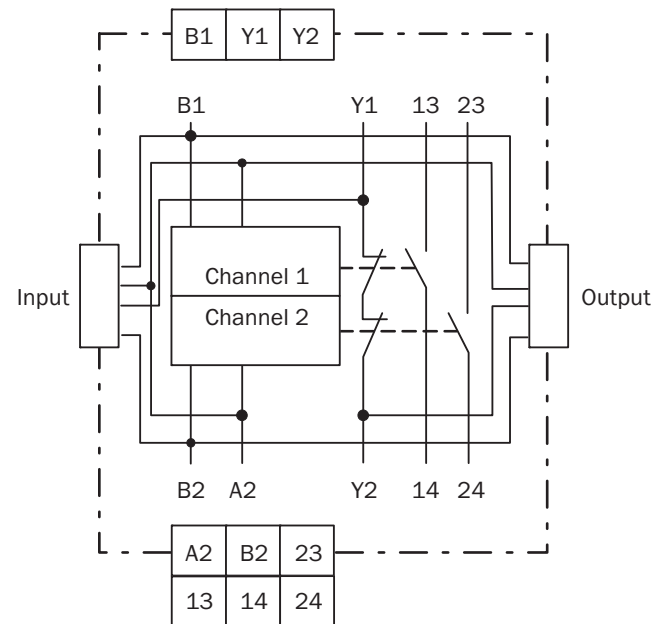
Type	UE10-2FG2D0	UE10-2FG3D0	UE12-2FG2D0	UE12-2FG3D0
Rated impulse withstand voltage $U_{imp}$	4 kV			
Overvoltage category	II			
Rated insulation voltage $U_i$	300 V AC			
Test voltage	1.2 kV			
Enclosure rating	<b>Clamps</b>		IP 20	
	<b>Housing</b>		IP 40	
Ambient operating temperature	0 °C ... +55 °C			
Storage temperature	-25 °C ... +75 °C			
Connection type	Screw-type terminals	Plug-in terminals	Screw-type terminals	Plug-in terminals
Conductor cross-section	0.2 mm <sup>2</sup> ... 1 mm <sup>2</sup>			
	Single wire (2x, same cross-section)			
	Single wire (1x)			
	Fine wire with ferrules (2x, same cross-section)			
Fine wire with ferrules (1x)				
Dimensions (W x H x D)	17.8 mm	17.8 mm	17.8 mm	17.8 mm
	x	x	x	x
	89.8 mm	105.5 mm	89.8 mm	105.5 mm
	x	x	x	x
Weight	70.8 mm	70.8 mm	70.8 mm	70.8 mm
	91 g			

Internal circuitry

UE10-2FG



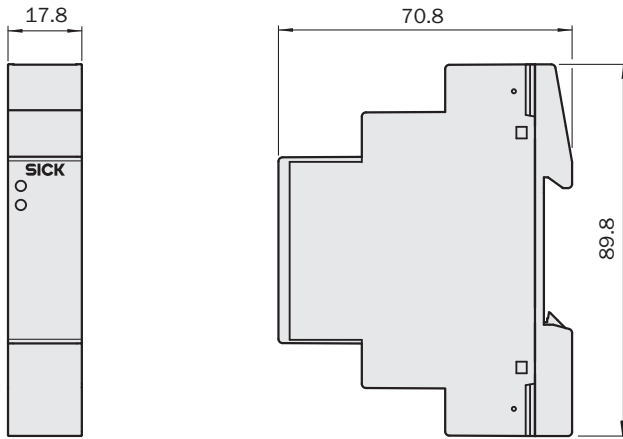
UE12-2FG



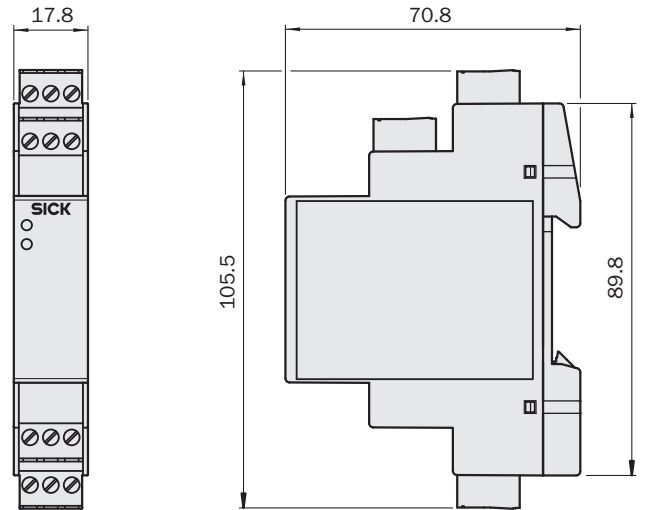
N

## Dimensional drawings

### Screw-type terminals



### Plug-in terminals

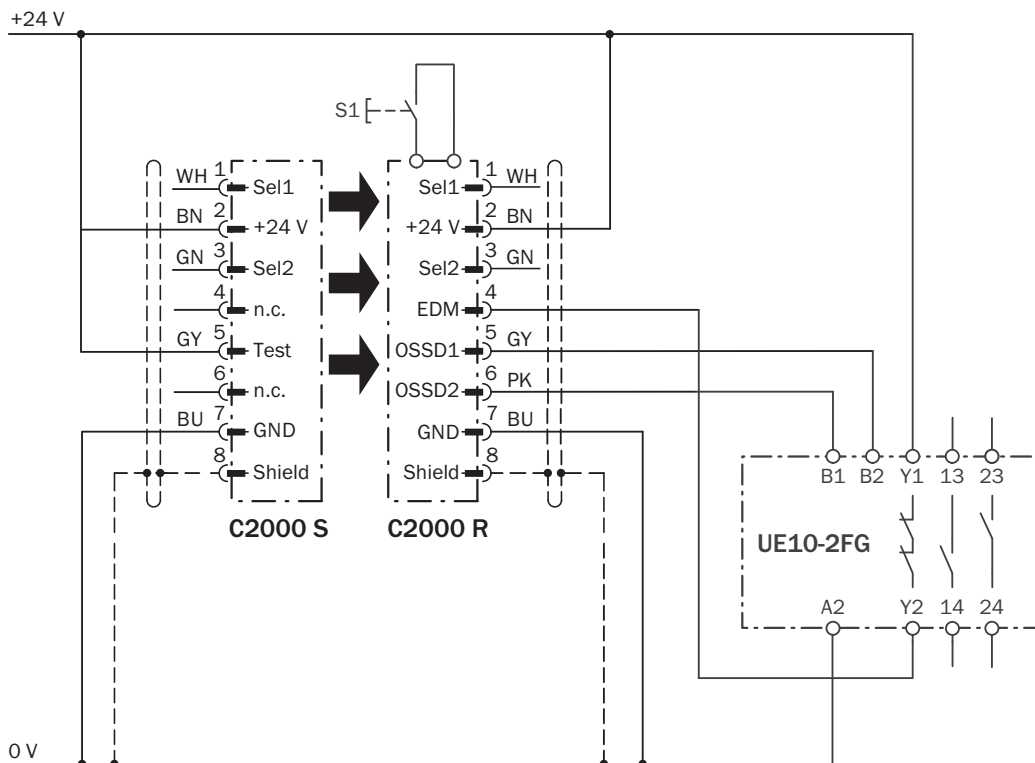


Dimensions in mm

## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### C2000 RES/EDM safety light curtain connected to UE10-2FG safety relay

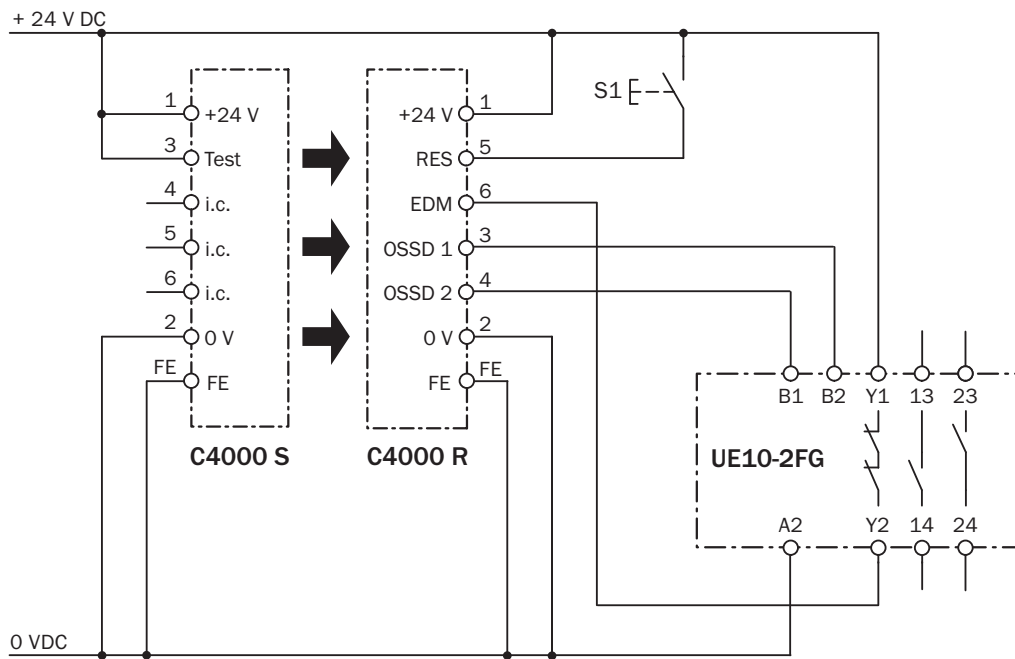


Operating mode: with manual reset and external device monitoring

N

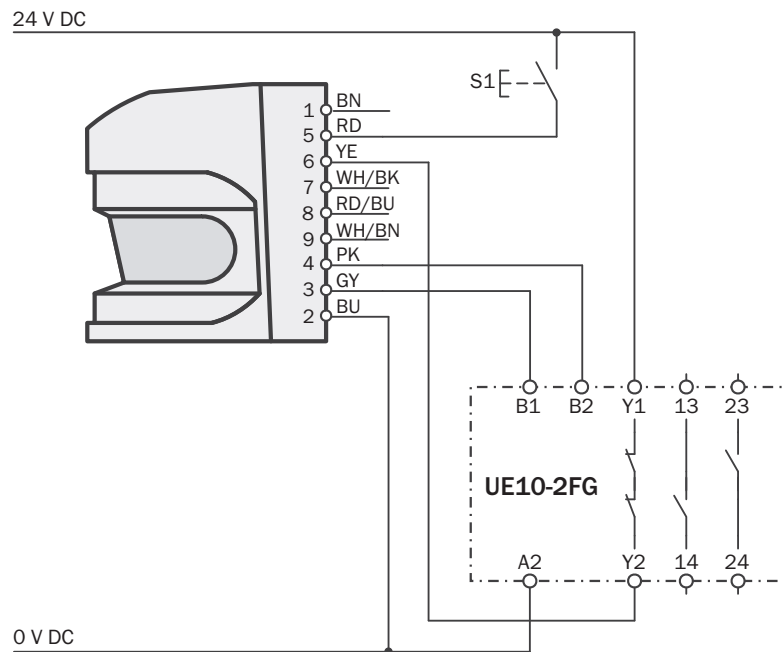


C4000 Standard/Advanced safety light curtain connected to UE10-2FG safety relay



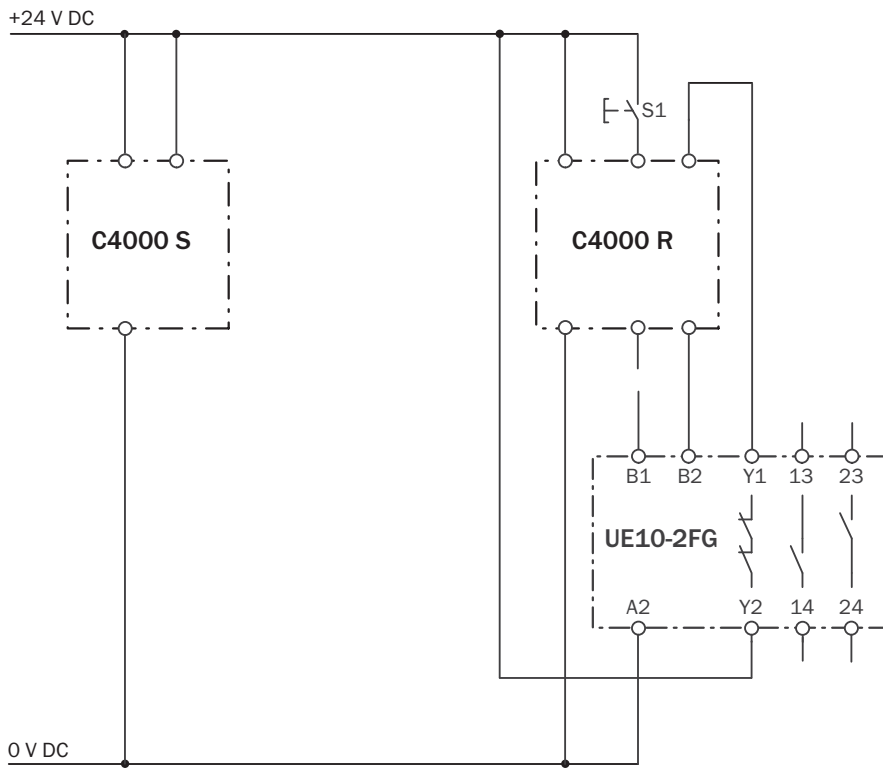
Operating mode: with manual reset and external device monitoring

S3000 Standard safety laser scanner connected to UE10-2FG safety relay



Operating mode: with manual reset and external device monitoring

C4000 Micro safety light curtain connected to UE10-2FG safety relay



Operating mode: with manual reset and external device monitoring

N

## Technical data overview

Category	Category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	PL e (EN ISO 13849) <sup>1)</sup>
Number of enable current contacts	3
Number of signaling current contacts	1
Input circuit	Single- or dual-channel
Housing width	22.5 mm

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

## Product description

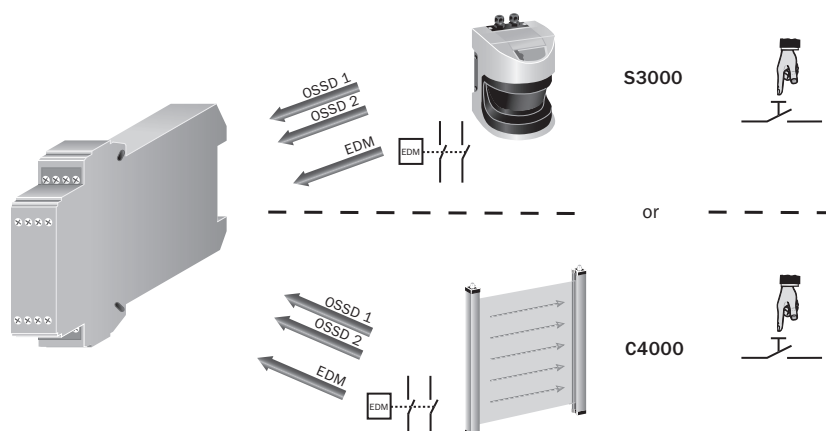
- NC contact for external device monitoring (EDM)
- 2 LEDs:
  - Relay K1
  - Relay K2
- Additional outputs available with the contact expansion modules
  - UE10-4XT
  - UE11-4DX
- Available with screw-type or plug-in terminals

## In-system added value

- Contact expansion module for electro-sensitive protective equipment (ESPE) with monitored semiconductor outputs, integral external device monitoring (EDM) and restart interlock, such as:
  - C2000, C4000
  - M2000, M4000
  - S3000
- Contact expansion module for safety systems with monitored semiconductor outputs, integral external device monitoring and restart interlock, such as:
  - Flexi Classic
  - Flexi Soft

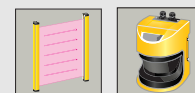
→ For more combinations, see annex

## Applications

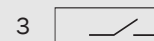


## Ordering information

Connection type	Type	Part no.
Screw-type terminals	UE10-30S2D0	6024917
Plug-in terminals	UE10-30S3D0	6024918



- For safety laser scanners
- For safety light curtains



Further information	Page
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→ Systematic safety	A-0
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# Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## General system data

Type	UE10-30S2DO	UE10-30S3DO
<b>Safety related parameters</b>		
Safety integrity level	SIL3 (IEC 61508) <sup>1)</sup> , SILCL3 (IEC 62061) <sup>1)</sup>	
Category	Category 4 (EN ISO 13849) <sup>1)</sup>	
Performance level	PL e (EN ISO 13849) <sup>1)</sup>	
B <sub>10d</sub> parameter	1.26 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 1.5 A), 5.9 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.75 A), 4.35 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2.5 A), 1 x 10 <sup>7</sup> switching cycles (DC-13, 24 V, I = 0.63 A)	
PFHd (mean probability of a dangerous failure per hour)	3.0 x 10 <sup>-8</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
<b>Voltage supply</b>	B1 - B4 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)	

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

## Input circuits B1 - B4

Type	UE10-30S2DO	UE10-30S3DO
Switch-on time	Max. 40 ms	
Input voltage	24 V DC (15 V DC ... 30 V DC)	
Input current	500 mA	

## Electrical output circuits 13 - 14, 23 - 24, 33 - 34, 41 - 42, Y1 - Y2

Type	UE10-30S2DO	UE10-30S3DO
Response time	20 ms <sup>1)</sup>	
Number of enable current (N/O) contacts	3, relevant for safety	
Number of signaling current (N/C) contacts	1, not safety-relevant	
Number of contactor monitoring (N/C) contacts	1, external device monitoring	
Contact type	Positively driven	
Contact material	Silver alloy, gold flashed	
Switching voltage		
Enable current contact	10 V AC ... 230 V AC	
Signaling current contact	10 V DC ... 30 V DC	
Contactor monitoring contact	10 V DC ... 24 V DC	
Switching current		
Enable current contact	10 mA ... 6 A	
Signaling current contact	10 mA ... 2 A	
Contactor monitoring contact	10 mA ... 0.1 A	
Total current	12 A	
Usage category	AC-15/DC-13	
Rated operating current (voltage)	4 A (230 V AC) 360 switching cycles/h 3 A (230 V AC) 3600 switching cycles/h 4 A (24 V DC) 360 switching cycles/h 2.5 A (24 V DC) 3600 switching cycles/h	
Maximum switching frequency	3600/h	
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles	
Electrical life (relay contacts)	2 x 10 <sup>6</sup> switching cycles	

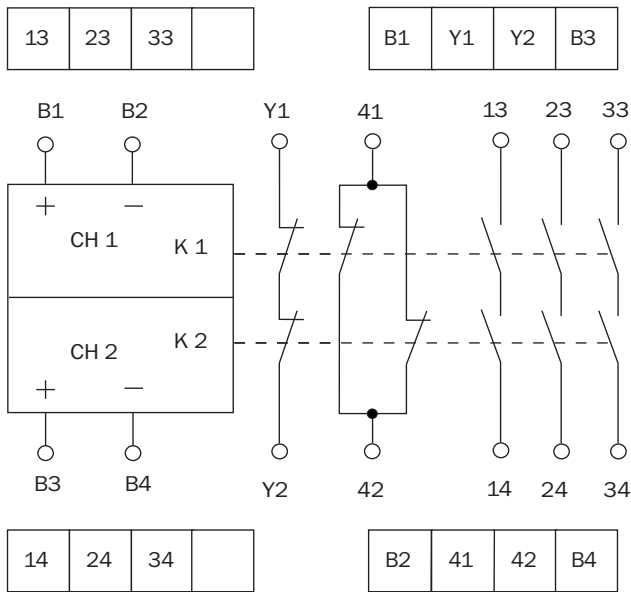
<sup>1)</sup> K1/K2



## Operating data

Type	UE10-30S2DO	UE10-30S3DO
Rated impulse withstand voltage $U_{imp}$	4 kV	
Overvoltage category	III	
Contamination rating		
External	3	
Internal	2	
Standard	EN 50178	
Rated insulation voltage $U_i$	300 V AC	
Test voltage	2 kV (50 Hz) EN 60439-1	
Enclosure rating		
Clamps	IP 20	
Housing	IP 40	
Interference emission	DIN EN 61000-6-4	
Interference resistance	EN 61000-6-2	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +75 °C	
Connection type	Screw-type terminals	Plug-in terminals
Conductor cross-section		
Single wire (2x, same cross-section)	0.15 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>	
Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm	
Weight	0.2 kg	

### Internal circuitry



**Function**

If the semiconductor outputs of the installed safety device (e.g., C4000, S3000) are energized, then the safety output contacts will close.

When at least one of the semiconductor outputs of the safety device becomes de-energized, then the output contacts revert back to open circuit status.

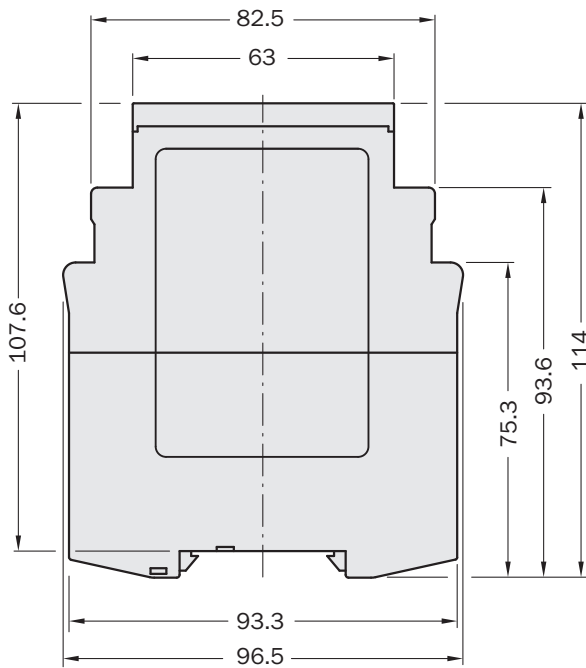
If restart interlock is needed, then this is achieved in the safety device, for example with a C4000 or S3000.

**External device monitoring (EDM)**

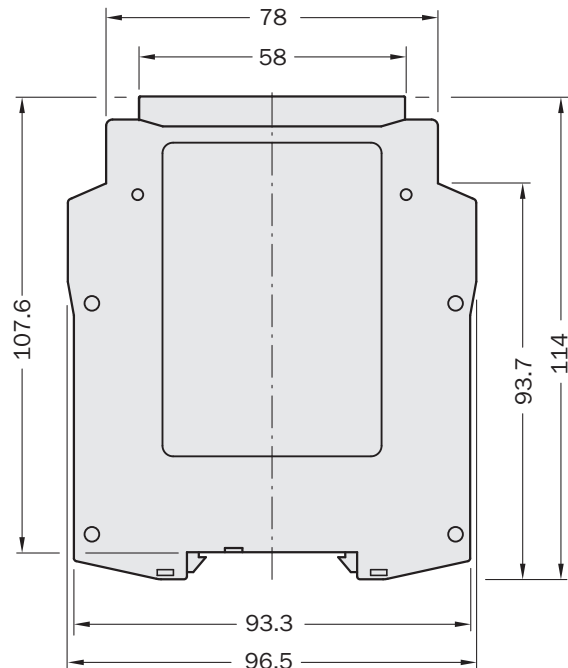
Category 3 or 4, which determines the performance level according to EN ISO 13849, requires monitoring of contactors for the detection of failures. This is provided in the connected protective device, for example in the C4000 or S3000. The normally closed contact (Y1 -Y2) in the UE10-30S unit is a part of this contactor monitoring system.

### Dimensional drawings

**Screw-type terminals**



**Plug-in terminals**



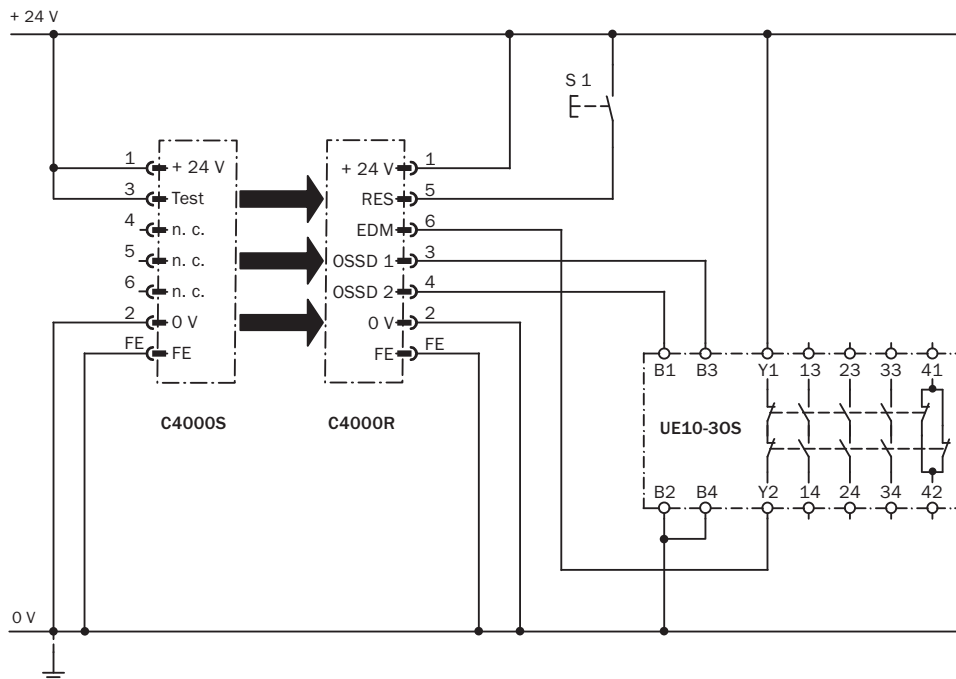
Dimensions in mm

N

## Connection diagrams

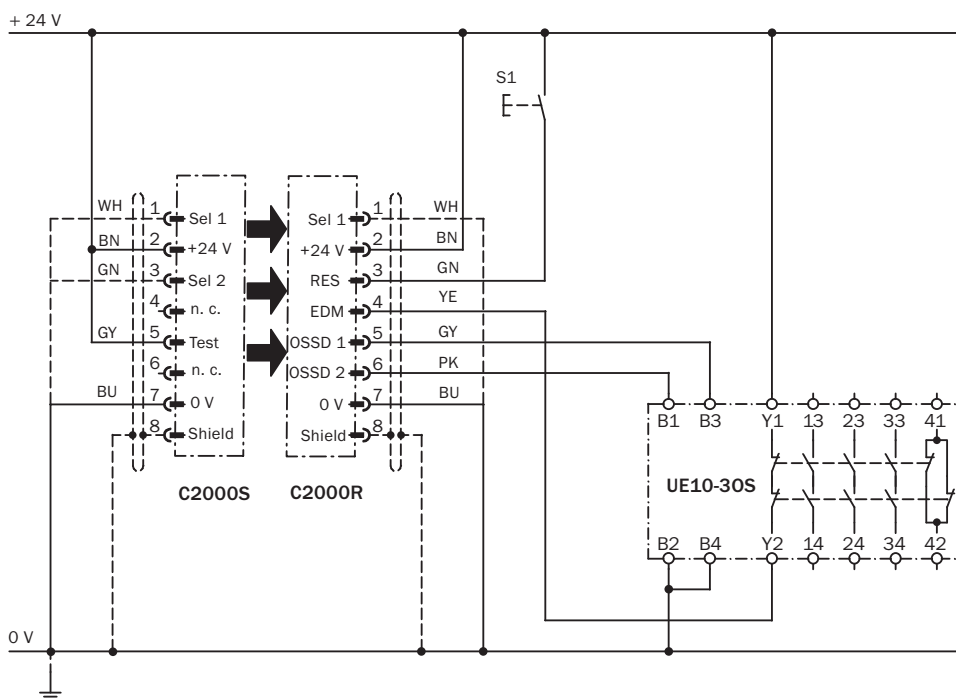
→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### C4000 Standard/Advanced safety light curtain connected to UE10-30S safety relay



Operating mode: with manual reset and external device monitoring

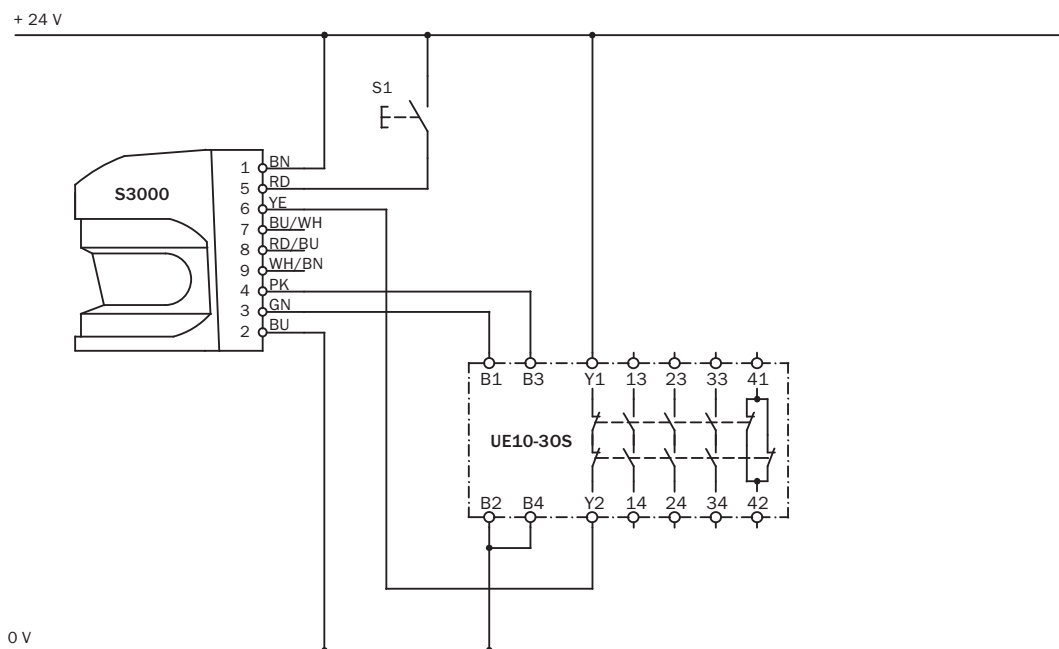
### C2000 RES/EDM safety light curtain connected to UE10-30S safety relay



Operating mode: with manual reset and external device monitoring

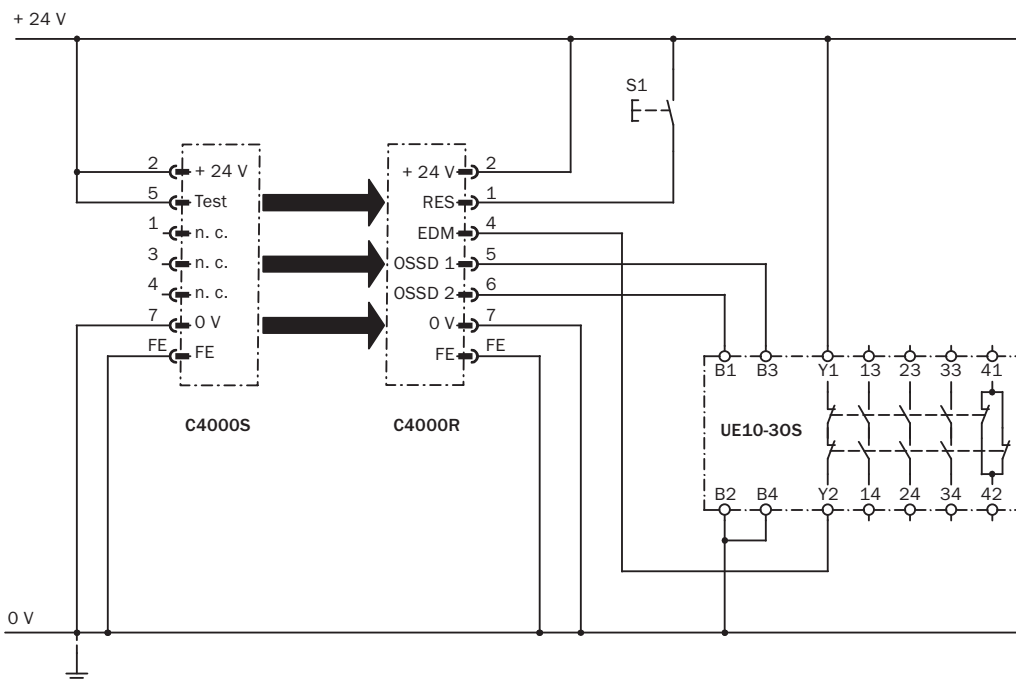
N

S3000 Standard safety laser scanner connected to UE10-30S safety relay



Operating mode: with manual reset and external device monitoring

C4000 Micro safety light curtain connected to UE10-30S safety relay



Operating mode: with manual reset and external device monitoring

N



## Technical data overview

Category	Category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	PL d (EN ISO 13849) <sup>1)</sup>
Number of enable current contacts	4
Number of signaling current contacts	2
Housing width	22.5 mm

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

## Product description

- The UE10-4XT contact expansion module provides:
  - Additional output contacts in a main unit
  - NC contact for external device monitoring (EDM)
- 2 LEDs for relays K1 and K2
- Screw-type or plug-in terminals

## In-system added value

Applicable with UE10 - UE48 main units

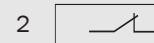
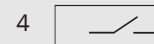
→ For more combinations, see annex

## Ordering information

Connection type	Type	Part no.
Screw-type terminals	UE10-4XT2D2	6024919
Plug-in terminals	UE10-4XT3D2	6024920



- Contact expansion module
- External device monitoring (EDM) within the main unit



Further information	Page
→ Technical specifications	N-70
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→ Dimensional drawings	N-73
→ Systematic safety	A-0
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# Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

## General system data

Type	UE10-4XT2D2	UE10-4XT3D2
<b>Safety related parameters</b>		
<b>Safety integrity level</b>	SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup>	
<b>Category</b>	Category 4 (EN ISO 13849) <sup>1)</sup>	
<b>Performance level</b>	PL d (EN ISO 13849) <sup>1)</sup>	
<b>B<sub>10d</sub> parameter</b>	1 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.5 A), 3.5 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2 A), 1.2 x 10 <sup>6</sup> switching cycles (DC-13, 24 V, I = 0.5 A)	
<b>PFHd (mean probability of a dangerous failure per hour)</b>	2.0 x 10 <sup>-7</sup> (EN ISO 13849)	
<b>T<sub>M</sub> (Mission Time)</b>	4 years (EN ISO 13849)	
<b>Voltage supply</b>	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)	
<b>Supply voltage</b>	A1, A2 24 V DC (20.4 V DC ... 26.4 V DC)	
<b>Power consumption</b>	2.7 VA, 1.5 W	
<b>Residual ripple</b>	2.4 V <sub>pp</sub> <sup>2)</sup>	
<b>Nominal frequency</b>	50 Hz ... 60 Hz <sup>3)</sup>	

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

<sup>2)</sup> In DC operation, within the limits of V<sub>S</sub>

<sup>3)</sup> In AC operation



## Electrical output circuits 13 - 14, 23 - 24, 33 - 34, 43 - 44, 51 - 52, 61 - 62, Y1 - Y2

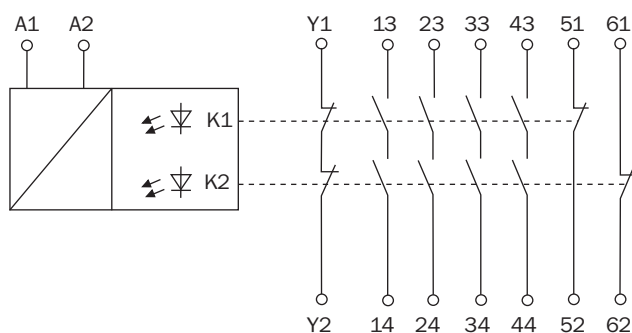
Type	UE10-4XT2D2	UE10-4XT3D2
Response time	40 ms <sup>1)</sup>	
Number of enable current (N/O) contacts	4, relevant for safety	
Number of signaling current (N/C) contacts	2, not safety-relevant	
Number of contactor monitoring (N/C) contacts	1, external device monitoring	
Contact type	Positively driven	
Contact material	Silver alloy, gold flashed	
Switching voltage		
Enable current contact	10 V AC ... 230 V AC 10 V DC ... 30 V DC	
Contactor monitoring contact	10 V DC ... 24 V DC	
Switching current		
Enable current contact	10 mA ... 6 A	
Signaling current contact	10 mA ... 2 A	
Contactor monitoring contact	10 mA ... 0.1 A	
Total current	12 A	
Usage category	AC-15/DC-13	
Rated operating current (voltage)	6 A (230 V AC) 360 switching cycles/h 6 A (24 V DC) 360 switching cycles/h 3 A (24 V DC) 3600 switching cycles/h	
Maximum switching frequency	3600/h	
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles	
Electrical life (relay contacts)	2 x 10 <sup>6</sup> switching cycles	

<sup>1)</sup> K1/K2

Operating data

Type		UE10-4XT2D2	UE10-4XT3D2
Rated impulse withstand voltage $U_{imp}$		4 kV	
Overvoltage category		III	
Contamination rating	External	3	
	Internal	2	
	Standard	EN 50178	
Rated insulation voltage $U_i$		300 V AC	
Test voltage		2 kV (50 Hz) EN 60439-1	
Enclosure rating	Clamps	IP 20	
	Housing	IP 40	
Interference emission		EN 60947-1 02/99	
Interference resistance		EN 60947-1 02/99	
Ambient operating temperature		-25 °C ... +55 °C	
Storage temperature		-25 °C ... +75 °C	
Connection type		Screw-type terminals	Plug-in terminals
Conductor cross-section	Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>	
	Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
	Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
	Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>	
Dimensions (W x H x D)		22.5 mm x 114 mm x 96.5 mm	
Weight		0.2 kg	

Internal circuitry



Function

The supply voltage of the contact expansion module is linked to the main unit's output contact.

Upon applying the supply voltage to terminals A1 and A2, relays K1 and K2 are energized (the LEDs for both relays illuminate): The 4 output contacts close and the two normally closed contacts and the EDM (feedback) circuit switch to open circuit status.

When the output contacts of the standard unit open (e.g., by activation of the emergency stop), the relays K1 and K2 de-energize: The normally open contacts open and the two normally closed contacts close.

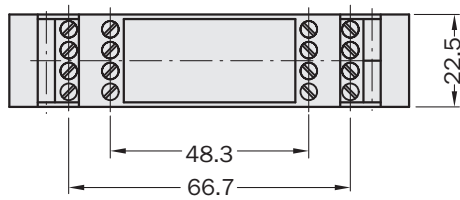
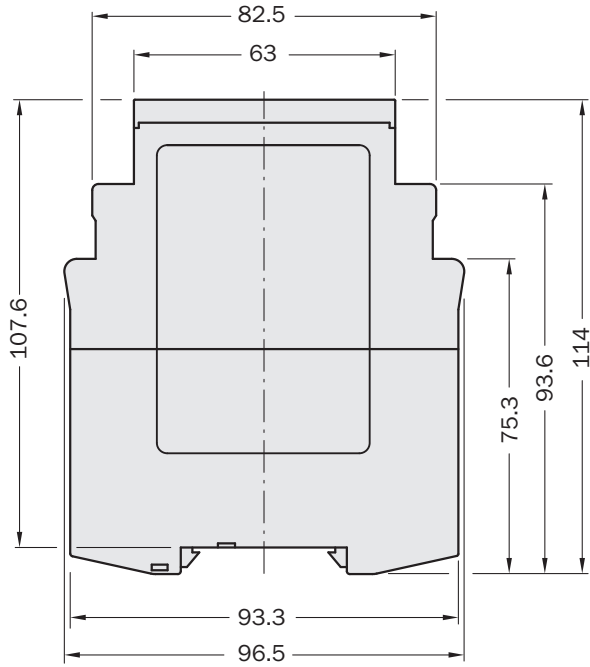
External device monitoring (EDM)

If external device monitoring is implemented in the connected main unit, then the normally closed contacts (Y1 - Y2) prevent the main unit from resetting when K1 and/or K2 do not de-energize.

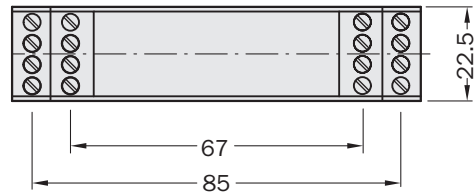
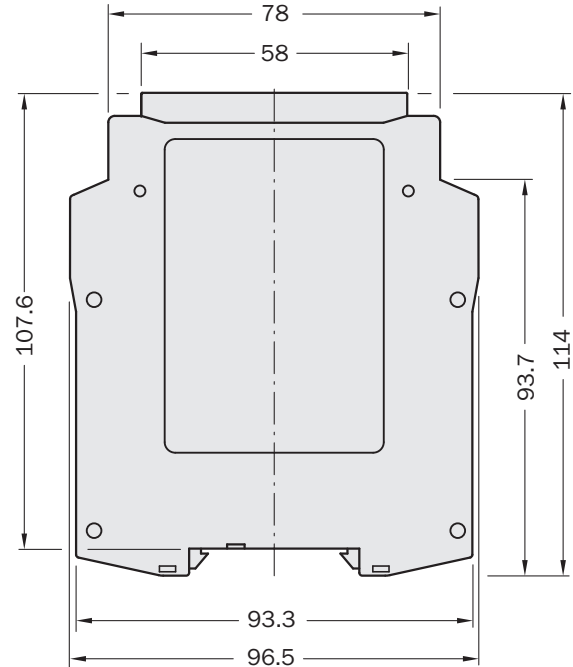


## Dimensional drawings

### Screw-type terminals



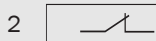
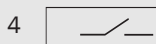
### Plug-in terminals



Dimensions in mm



- Contact expansion module
- External device monitoring (EDM) within the main unit



## Technical data overview

Category	Category 4 (EN ISO 13849) <sup>1)</sup>
Performance level	PL d (EN ISO 13849) <sup>1)</sup>
Number of enable current contacts	4
Number of delayed deactivation signaling current contacts	2
Housing width	22.5 mm

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

## Product description

- The UE11-4DX contact expansion module provides:
  - Additional output contacts in a main unit
  - Off-delayed outputs (0.5, 1, 2, 3 s, depending on model)
  - NC contact for external device monitoring (EDM)
- 2 LEDs for relays K1 and K2
- Screw-type or plug-in terminals

## In-system added value

- Applicable with UE10 - UE48 main units

→ For more combinations, see annex

## Ordering information

Connection type	Off-delay time	Type	Part no.
Screw-type terminals	0.5 s	UE11-4DX2D30.5	6024921
	1 s	UE11-4DX2D31	6024922
	2 s	UE11-4DX2D32	6024923
	3 s	UE11-4DX2D33	6024924
Plug-in terminals	0.5 s	UE11-4DX3D30.5	6024925
	1 s	UE11-4DX3D31	6024926
	2 s	UE11-4DX3D32	6024927
	3 s	UE11-4DX3D33	6024928

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→ Dimensional drawings	N-79
→ Systematic safety	A-0
→ Services	B-0

N

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE11-4DX2D30.5	UE11-4DX2D31	UE11-4DX2D32	UE11-4DX2D33	UE11-4DX3D30.5	UE11-4DX3D31	UE11-4DX3D32	UE11-4DX3D33
<b>Safety related parameters</b>								
<b>Safety integrity level</b>	SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup>							
<b>Category</b>	Category 4 (EN ISO 13849) <sup>1)</sup>							
<b>Performance level</b>	PL d (EN ISO 13849) <sup>1)</sup>							
<b>B<sub>10d</sub> parameter</b>	1 x 10 <sup>6</sup> switching cycles (AC-15, 230 V, I = 0.5 A), 3 x 10 <sup>5</sup> switching cycles (DC-13, 24 V, I = 2 A), 1.2 x 10 <sup>6</sup> switching cycles (DC-13, 24 V, I = 0.5 A)							
<b>PFHd (mean probability of a dangerous failure per hour)</b>	2.0 x 10 <sup>-7</sup> (EN ISO 13849)							
<b>T<sub>M</sub> (Mission Time)</b>	4 years (EN ISO 13849)							
<b>Voltage supply</b>	A1, A2 PELV (Output circuit > 25 V AC / 60 V DC) PELV or SELV (Output circuit < 25 V AC / 60 V DC)							
<b>Supply voltage</b>	A1, A2 24 V DC (20.4 V ... 26.4 V)							
<b>Power consumption</b>	2 W							
<b>Residual ripple</b>	2.4 V <sub>pp</sub> <sup>2)</sup>							
<b>Switch-on time</b>	75 ms							

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored using an appropriate main unit

<sup>2)</sup> In DC operation, within the limits of V<sub>S</sub>

Electrical output circuits 17 - 18, 27 - 28, 37 - 38, 47 - 48, 55 - 56, 65 - 66, Y1 - Y2

Type	UE11-4DX2D30.5	UE11-4DX2D31	UE11-4DX2D32	UE11-4DX2D33	UE11-4DX3D30.5	UE11-4DX3D31	UE11-4DX3D32	UE11-4DX3D33
Off-delay time	0.5 s	1 s	2 s	3 s	0.5 s	1 s	2 s	3 s
Number of enable current (N/O) contacts	4, relevant for safety							
Number of signaling current (N/C) contacts	2, not safety-relevant							
Number of contactor monitoring (N/C) contacts	1, external device monitoring							
Contact type	Positively driven							
Contact material	Silver alloy, gold flashed							
Switching voltage								
Enable current contact	10 V AC ... 230 V AC							
Contactor monitoring contact	10 V DC ... 30 V DC							
Switching current								
Enable current contact	10 mA ... 6 A							
Signaling current contact	10 mA ... 2 A							
Contactor monitoring contact	10 mA ... 0.1 A							
Total current	12 A							
Usage category	AC-15/DC-13							
Rated operating current (voltage)	6 A (230 V AC) 3600 switching cycles/h 6 A (24 V DC) 360 switching cycles/h 3 A (24 V DC) 3600 switching cycles/h							
Maximum switching frequency	3600/h							
Mechanical life (relay contacts)	1 x 10 <sup>7</sup> switching cycles							
Electrical life (relay contacts)	2 x 10 <sup>6</sup> switching cycles							

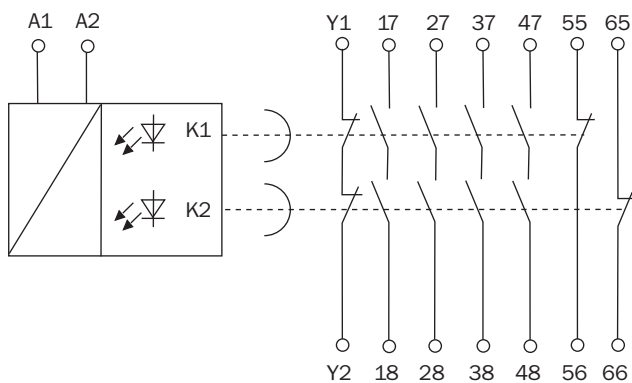




## Operating data

Type	UE11-4DX2D30.5	UE11-4DX2D31	UE11-4DX2D32	UE11-4DX2D33	UE11-4DX3D30.5	UE11-4DX3D31	UE11-4DX3D32	UE11-4DX3D33
Rated impulse withstand voltage $U_{imp}$	4 kV							
Overvoltage category	III							
Contamination rating								
External	3							
Internal	2							
Standard	EN 50178							
Rated insulation voltage $U_i$	300 V AC							
Test voltage	2 kV (50 Hz) EN 60439-1							
Enclosure rating								
Clamps	IP 20							
Housing	IP 40							
Interference emission	EN 60947-1 02/99							
Interference resistance	EN 60947-1 02/99							
Ambient operating temperature	-25 °C ... +55 °C							
Storage temperature	-25 °C ... +75 °C							
Connection type	Screw-type terminals				Plug-in terminals			
Conductor cross-section								
Single wire (2x, same cross-section)	0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>							
Single wire (1x)	0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>							
Fine wire with ferrules (2x, same cross-section)	0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>							
Fine wire with ferrules (1x)	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>							
Dimensions (W x H x D)	22.5 mm x 114 mm x 96.5 mm							
Weight	0.2 kg							

## Internal circuitry



### Function

The supply voltage of the contact expansion module is triggered by the standard unit's output contact.

Upon applying the supply voltage to terminals A1 and A2, relays K1 and K2 are energized (the LEDs for both relays illuminate):

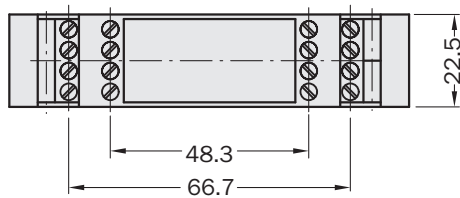
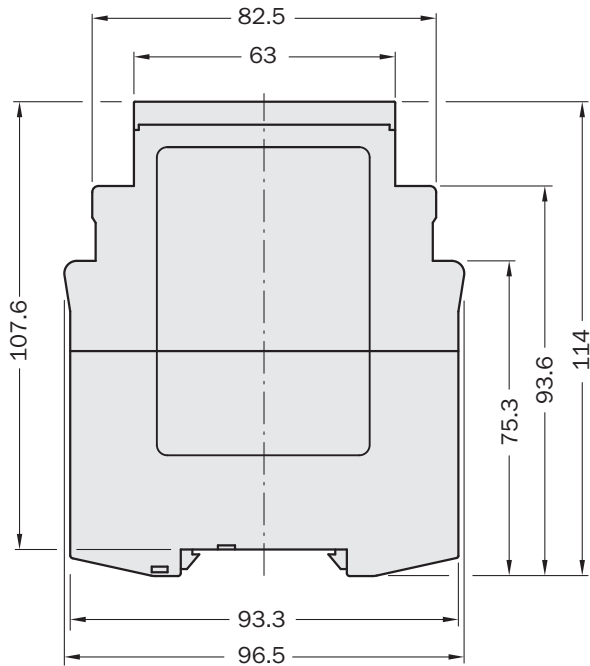
The 4 output contacts close and the two normally closed contacts and the EDM (feedback) circuit switch to open circuit status. When the output contacts of the standard unit open (e.g., by activation of the emergency stop switch), the relays K1 and K2 de-energize after a unit specific delay. These fixed switch-off delay times of 0.5 s, 1 s, 2 s and 3 s are according to the type. This is achieved by means of capacitors to ensure that the off-delay runs its full duration, even during power supply failures. Only after the delay period has expired do the relays K1 and K2 return to their neutral rest position. With the combination of UE11-4DX (with off-delayed) and a standard unit, stop category 1 (EN 418) can be realized.

### External device monitoring (EDM)

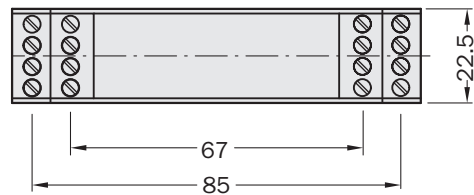
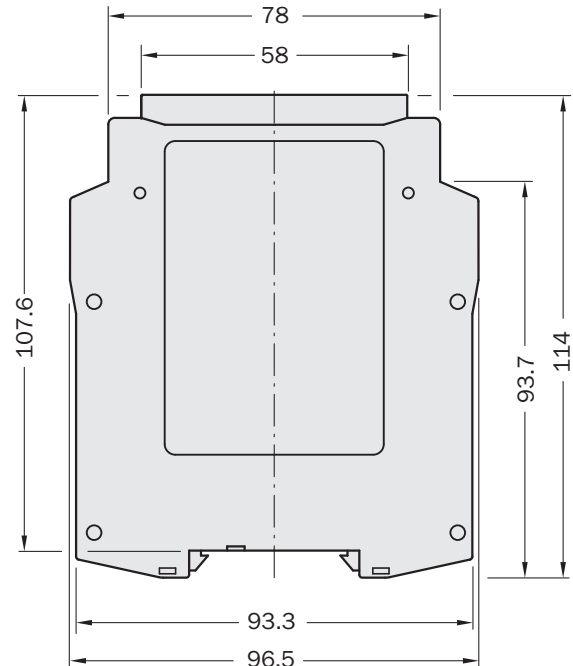
If external device monitoring is implemented in the upstream installed standard unit, then the normally closed contacts (Y1 - Y2) prevent the standard unit from resetting, when K1 and/or K2 do not de-energize.

# Dimensional drawings

## Screw-type terminals



## Plug-in terminals



Dimensions in mm

# Safety controllers

## Technical overview and applications

Flexi Classic and Flexi Soft safety controllers are both modular and expandable units, which prevents unnecessary inputs and outputs. Using SICK's configuration tools, the planning engineer has the ability to quickly select sensors and actuators by dragging and dropping specific symbols into our easy-to-use software. This results in a complete connection diagram with

trouble-free electrical installation. Both the Flexi Classic and Flexi Soft can be optimally integrated with all safety sensors. Gateways for all leading networks (e.g., PROFINET IO, PROFIBUS-DP, CANopen®, Modbus TCP, Ethernet (TCP/IP)) are available. This helps minimize downtimes significantly.

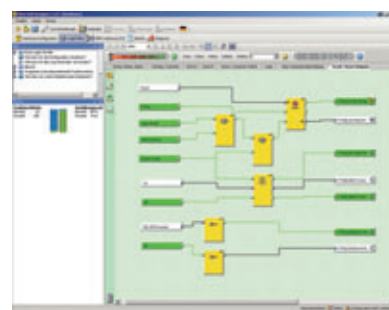


### Impressively easy: Flexi Classic

- Function setting via rotary switch
- Easy configuration through certified programs (4 function blocks)
- Significant advantages over relays:
  - Less space required
  - Reduced wiring effort
  - Shorter response times
- Complete diagnostics through LED indicators on the modules results in less downtime

### Intuitive software, modular hardware: Flexi Soft

- Intuitive configuration software with 38 certified function blocks
- Safe networking of up to 4 Flexi Soft stations without additional hardware (Flexi Link technology)
- Immediate verification of the safety function using the simulation mode
- Quick commissioning through configuration memory in the system plug



### Flexi Classic Configurator: Just a few clicks to reach your goal

The Flexi Classic configurator is an immense help in preparing a Flexi system. You can place modules side by side; adding sensors and actuators using the drag and drop feature. Plus, the view of the internal logic makes design quick and easy. The programs produced can be set on the device using a screwdriver.





### Flexi Soft Designer: Powerful logic to quickly create a project

From the easy-to-place modules and elements, to the logic simulation and the wiring, the Flexi Soft Designer is an intuitive tool throughout the configuration process. With 38 available logic blocks and the option to export/import application parts, it is easy to control safety-related functions.

→ Project Flexi Classic system: [www.sens-control.com](http://www.sens-control.com)

→ Project Flexi Soft system: [www.sens-control.com](http://www.sens-control.com)



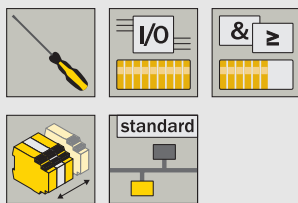
Application	Description	Number of inputs	Number of outputs	Minimum system width	Number of selectable function blocks	Functions				Product	Page
						Configuration via screwdriver	Software-based	Safe device communication via EFI <sup>2)</sup>	Linking of up to 4 stations		
	 <b>Modular safety controller</b>	4 ... 100 <sup>1)</sup>	4 ... 52 <sup>1)</sup>	1 module (22.5 mm)	4 <sup>3)</sup>	✓	-	-	-	Flexi Classic	0-2
	 <b>Modular safety controller</b>	4 ... 96 <sup>1)</sup>	4 ... 48 <sup>1)</sup>	2 modules (45 mm)	38 <sup>4)</sup>	-	✓	✓	✓	Flexi Soft	0-25

<sup>1)</sup> Depending on module combination

<sup>2)</sup> Enhanced Function Interface (EFI), communication interface to SICK safety sensors; further information → page A-8

<sup>3)</sup> AND/OR/Bypass/Muting

<sup>4)</sup> Consisting of the following groups: Standard Boolean, start/edge, delays, counter and fast shut-off, EDM/output modules, muting/presses



- Optimal integration of SICK safety devices
- Significant reduction in the control cabinet width
- Easy program selection using rotary switches (no software required)
- Significant reduction in the wiring effort
- Relay module
- PROFIBUS-DP, DeviceNet, CANopen, Modbus TCP, Ethernet (TCP/IP), EtherNet/IP and PROFINET IO integration



Further information	Page
→ Technical specifications	0-5
→ Internal circuitry	0-18
→ Dimensional drawings	0-20
→ Connection diagrams	0-21
→ Accessories	0-24
→ Systematic safety	A-0
→ Services	B-0

## Technical data overview

Number of inputs	4 ... 100, depending on module combination
Number of outputs	4 ... 52, depending on module combination
Fieldbus (depending on type)	CANopen®, DeviceNet, Ethernet (TCP/IP), EtherNet/IP, Modbus TCP, PROFIBUS-DP, PROFINET IO
Program selection	Adjustable by means of rotary switch
Logical functions (depending on type)	Muting, Override / OR, AND, BYPASS
Number of muting sensors (depending on type)	2 ... 4

## Product description

The Flexi Classic series uses a safety control concept that enables different units and modules to be connected together based on the application requirements.

The plug-in style units enable communication between the individual units over an internal bus.

The connected sensors and the function are defined using rotary switches on the related units; except for the relay modules and the fieldbus modules, which are used for integration in a higher level controller without a safety function. These modules are output units and have no effect on the logic set or the function of the upstream units.

The Flexi Classic series comprises the following units:

- UE410-MU (main unit)
- UE410-XU (extension unit)
- UE410-8DI (input expansion unit)
- UE410-MM (muting main unit)
- UE410-XM (muting extension unit)
- UE410-MDI (muting expansion unit)
- UE410-2RO/-4RO (relay module)
- UE410-PRO/UE410-DEV/UE410-CAN/UE410-EN (gateway PROFIBUS-DP, DeviceNet, CANopen, Modbus TCP, Ethernet (TCP/IP), EtherNet/IP and PROFINET IO)

## In-system added value

A Flexi Classic system always comprises a main unit (UE410-MU) or muting main unit (UE410-MM) and, as required, additional

extension units and an appropriate gateway.

Module	Number of inputs	Number of outputs	Delay time (adjustable at outputs Q3/Q4)	Functions	Fieldbus	Number of application diagnostic outputs
Main unit	4	4	0 ... 300 s (depending on type)	AND, OR, BYPASS	-	-
Extension unit	4	4			-	-
Input expansion unit	4 dual-channel	-			-	-
Muting main unit	6	4	-	Muting	-	-
Muting extension unit	6	4	-		-	
Muting input expansion unit	3	-	-	Muting, Belt stop, Override	-	-
Relay module <sup>1)</sup>	-	2/4 relay outputs	-	-	-	1/2
Gateway	-	-	-	Diagnostics <sup>2)</sup>	✓ <sup>3)</sup>	-

<sup>1)</sup> UE10-2FG/UE12-2FG safety relays may be used as an alternative (cf. N-57).

<sup>2)</sup> Via standard network

<sup>3)</sup> PROFIBUS-DP, DeviceNet, CANopen®, Modbus TCP, Ethernet (TCP/IP), EtherNet/IP, PROFINET IO

→ Configuring Flexi Classic modules: [www.sens-control.com](http://www.sens-control.com)

## Ordering information

### Main unit

- Number of inputs: 2 dual-channel or 4 single-channel
- Number of outputs: 2 dual-channel or 4 single-channel

Delay time (outputs Q3/Q4)	Connection type	Type	Part no.
-	Plug-in terminals	UE410-MU3T0	6035242
	Dual-level spring clamp terminals	UE410-MU4T0	6035243
0 s ... 5 s	Plug-in terminals	UE410-MU3T5	6026136
	Dual-level spring clamp terminals	UE410-MU4T5	6032669
0 s ... 50 s	Plug-in terminals	UE410-MU3T50	6026137
	Dual-level spring clamp terminals	UE410-MU4T50	6032670
0 s ... 300 s	Plug-in terminals	UE410-MU3T300	6026138
	Dual-level spring clamp terminals	UE410-MU4T300	6032671

### Extension unit

- Number of inputs: 2 dual-channel or 4 single-channel
- Number of outputs: 2 dual-channel or 4 single-channel

Delay time (outputs Q3/Q4)	Connection type	Type	Part no.
-	Plug-in terminals	UE410-XU3T0	6035244
	Dual-level spring clamp terminals	UE410-XU4T0	6035245
0 s ... 5 s	Plug-in terminals	UE410-XU3T5	6032470
	Dual-level spring clamp terminals	UE410-XU4T5	6032672
0 s ... 50 s	Plug-in terminals	UE410-XU3T50	6032471
	Dual-level spring clamp terminals	UE410-XU4T50	6032673
0 s ... 300 s	Plug-in terminals	UE410-XU3T300	6032472
	Dual-level spring clamp terminals	UE410-XU4T300	6032674

### Input expansion unit

- Number of inputs: 4 dual-channel or 8 single-channel

Connection type	Type	Part no.
Plug-in terminals	UE410-8DI3	6026139
Dual-level spring clamp terminals	UE410-8DI4	6032675

### Muting main unit

- Number of inputs: 1 dual-channel and 4 single-channel
- Number of outputs: 1 dual-channel and 2 single-channel
- Muting: ✓
- Number of muting sensors: 2 ... 4

Connection type	Type	Part no.
Plug-in terminals	UE410-MM3	6034482
Dual-level spring clamp terminals	UE410-MM4	6034645

## Muting extension unit

- Number of inputs: 1 dual-channel and 4 single-channel
- Number of outputs: 1 dual-channel and 2 single-channel
- Muting: ✓
- Number of muting sensors: 2 ... 4

Connection type	Type	Part no.
Plug-in terminals	UE410-XM3	6034483
Dual-level spring clamp terminals	UE410-XM4	6034646

## Muting input expansion unit

- Number of inputs: 3 single-channel
- Muting: ✓

Connection type	Type	Part no.
Plug-in terminals	UE410-MDI3	6034484
Dual-level spring clamp terminals	UE410-MDI4	6034647

## Relay module

Number of N/O contacts	Number of application diagnostic outputs	Connection type	Type	Part no.
2	1	Plug-in terminals	UE410-2R03 <sup>1)</sup>	6026144
		Dual-level spring clamp terminals	UE410-2R04 <sup>1)</sup>	6032677
4	2	Plug-in terminals	UE410-4R03 <sup>1)</sup>	6026143
		Dual-level spring clamp terminals	UE410-4R04 <sup>1)</sup>	6032676

<sup>1)</sup> Alternatively UE10-2FG/UE12-2FG safety relays may be used (cf. (N-57)).

## Gateway

Connection type	Fieldbus	Type	Part no.
Plug-in terminals	PROFIBUS-DP	UE410-PRO3	6028407
Dual-level spring clamp terminals		UE410-PRO4	6032678
Plug-in terminals	DeviceNet	UE410-DEV3	6032469
Dual-level spring clamp terminals		UE410-DEV4	6032679
Plug-in terminals	CANopen®	UE410-CAN3	6033111
Dual-level spring clamp terminals		UE410-CAN4	6033112
Screw-terminal connector	Ethernet (TCP/IP), EtherNet/IP	UE410-EN1	1042964
	Ethernet (TCP/IP), Modbus TCP	UE410-EN3	1042193
	PROFINET IO	UE410-EN4	1044078



## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### Main unit

#### General data

Type	UE410- MU3T0	UE410- MU4T0	UE410- MU3T5	UE410- MU4T5	UE410- MU3T50	UE410- MU4T50	UE410- MU3T300	UE410- MU4T300
<b>Safety related parameters</b>								
Safety integrity level	SIL3 (IEC 61508)							
Category	Category 4 (EN ISO 13849)							
Performance level	PL e (EN ISO 13849)							
PFHd (mean probability of a dangerous failure per hour)	$2.5 \times 10^{-9}$ <sup>1)</sup> , $6.0 \times 10^{-9}$ <sup>2)</sup> (EN ISO 13849)							
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)							
Ambient operating temperature	-25 °C ... +55 °C							
Storage temperature	-25 °C ... +70 °C							
Air humidity from ... to	15 % ... 95 %, non-condensing							
Climate conditions according to	EN 61131-2							
Vibration resistance	5 Hz ... 500 Hz							
Vibration resistance (checked to)	EN 60068-2-6, EN 61131-2							
Enclosure rating	EN/IEC 60529							
Clamps	IP 40							
Housing	IP 20							
Electromagnetic compatibility (EMC)	Class A (EN 61000, EN 55011)							
Protection class	III							
System connection	Cable gland							
Connection type	Plug-in terminals	Dual-level spring clamp terminals	Plug-in terminals	Dual-level spring clamp terminals	Plug-in terminals	Dual-level spring clamp terminals	Plug-in terminals	Dual-level spring clamp terminals
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>							
Dimensions (W x H x D)	29 mm x 96.5 mm x 120.8 mm							
Weight	180 g							

<sup>1)</sup> Dual-channel outputs

<sup>2)</sup> Single-channel outputs

Electrical data

Type	UE410- MU3T0	UE410- MU4T0	UE410- MU3T5	UE410- MU4T5	UE410- MU3T50	UE410- MU4T50	UE410- MU3T300	UE410- MU4T300
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)							
Type of supply voltage	PELV (electrical output circuit on UE410-4RO/UE410-2RO > 25 V AC/60 V DC) PELV or SELV (electrical output circuit on UE410-4RO/UE410-2RO < 25 V AC/60 V DC)							
Power consumption	3 W							
Switch-on time	Max. 60 s							
Short-circuit protection	4 A gG (with tripping characteristics B or C)							
Input circuit (I1 - I4, EN, S1 - S3)	<p>Number of inputs 2 dual-channel or 4 single-channel</p> <p>Input voltage HIGH 13 V DC ... 30 V DC</p> <p>Input voltage LOW -5 V DC ... 5 V DC</p> <p>Input current HIGH 2.4 mA ... 3.8 mA</p> <p>Input current LOW -2.5 mA ... 2.1 mA</p> <p>Switch-on time Min. 70 ms</p> <p>Synchronous time monitoring 1500 ms (at program 2) 500 ms (at program 4 and 5)</p> <p>Number of muting sensors 0, 2</p> <p>Muting time to operate Max. 61 ms, at program 3 <sup>1)</sup></p> <p>Tolerated muting sensor signal interrupt Max. 100 ms, at program 3 <sup>2)</sup></p> <p>Switch-on time ENTER button 3 s <sup>3)</sup></p>							
Control outputs (X1, X2)	<p>Number of outputs 2</p> <p>Type of output PNP semiconductors, short-circuit protected, cross-circuit monitored</p> <p>Output voltage 16 V DC ... 30 V DC</p> <p>Output current Max. 120 mA</p> <p>Test pulse width 40 ms (at program 1, 2, 4, 5, 6 and 9 on X1 and X2, at program 3.2 on X1) 52 ms (at program 3.2 on X2)</p> <p>Test pulse rate 5 Hz</p> <p>Load capacity (test pulse width) 1000 nF (40 ms)</p>							
Safety outputs (Q1, Q2, Q3, Q4)	<p>Number of outputs 4</p> <p>Type of output PNP semiconductors, short-circuit protected, cross-circuit monitored</p> <p>Output voltage 18 V DC ... 30 V DC</p> <p>Output current Max. 2 A</p> <p>Test pulse width 700 µs</p> <p>Test pulse rate 12.5 Hz ... 32 Hz</p> <p>Load capacity 1000 nF</p> <p>Cable length 100 m (1.5 mm<sup>2</sup>)</p> <p>Response time 13 ms ... 79 ms <sup>4)</sup></p> <p>Delay time (outputs Q3/Q4) - 0 s ... 5 s, adjustable 0 s ... 50 s, adjustable 0 s ... 300 s, adjustable</p>							

- <sup>1)</sup> Time between valid muting condition and active muting
- <sup>2)</sup> One muting input may be LOW for this time
- <sup>3)</sup> Upon applying the supply voltage
- <sup>4)</sup> Depending on the selected program and the connected sensors



## Functional data

Type	UE410-MU3T0	UE410-MU4T0	UE410-MU3T5	UE410-MU4T5	UE410-MU3T50	UE410-MU4T50	UE410-MU3T300	UE410-MU4T300
Reset/restart	Manual, automatic/configurable							
External device monitoring	✓							
Emergency stop switch	✓							
Logical functions	OR, AND, BYPASS, Muting							
Muting	✓							

## Extension unit

## General data

Type	UE410-XU3T0	UE410-XU4T0	UE410-XU3T5	UE410-XU4T5	UE410-XU3T50	UE410-XU4T50	UE410-XU3T300	UE410-XU4T300
Safety related parameters								
Safety integrity level	SIL3 (IEC 61508)							
Category	Category 4 (EN ISO 13849)							
Performance level	PL e (EN ISO 13849)							
PFHd (mean probability of a dangerous failure per hour)	$2.5 \times 10^{-9} 1)$ , $6.0 \times 10^{-9} 2)$ (EN ISO 13849)							
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)							
Ambient operating temperature	-25 °C ... +55 °C							
Storage temperature	-25 °C ... +70 °C							
Air humidity from ... to	15 % ... 95 %, non-condensing							
Climate conditions according to	EN 61131-2							
Vibration resistance	5 Hz ... 500 Hz							
Vibration resistance (checked to)	EN 60068-2-6, EN 61131-2							
Enclosure rating	EN/IEC 60529							
Clamps	IP 40							
Housing	IP 20							
Electromagnetic compatibility (EMC)	Class A (EN 61000, EN 55011)							
Protection class	III							
System connection	Cable gland							
Connection type	Plug-in terminals	Dual-level spring clamp terminals	Plug-in terminals	Dual-level spring clamp terminals	Plug-in terminals	Dual-level spring clamp terminals	Plug-in terminals	Dual-level spring clamp terminals
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>							
Dimensions (W x H x D)	22.5 mm x 96.5 mm x 120.8 mm							
Weight	180 g							

<sup>1)</sup> Dual-channel outputs

<sup>2)</sup> Single-channel outputs

Electrical data

Type	UE410- XU3T0	UE410- XU4T0	UE410- XU3T5	UE410- XU4T5	UE410- XU3T50	UE410- XU4T50	UE410- XU3T300	UE410- XU4T300
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)							
Type of supply voltage	PELV (electrical output circuit on UE410-4RO/UE410-2RO > 25 V AC/60 V DC) PELV or SELV (electrical output circuit on UE410-4RO/UE410-2RO < 25 V AC/60 V DC)							
Power consumption	3 W							
Switch-on time	Max. 60 s							
Short-circuit protection	4 A gG (with tripping characteristics B or C)							
Input circuit (I1 - I4, EN, S1 - S3)								
Number of inputs	2 dual-channel or 4 single-channel							
Input voltage HIGH	13 V DC ... 30 V DC							
Input voltage LOW	-5 V DC ... 5 V DC							
Input current HIGH	2.4 mA ... 3.8 mA							
Input current LOW	-2.5 mA ... 2.1 mA							
Switch-on time	Min. 70 ms							
Synchronous time monitoring	1500 ms (at program 2) 500 ms (at program 4 and 5)							
Number of muting sensors	0, 2							
Muting time to operate	Max. 61 ms, at program 3 <sup>1)</sup>							
Tolerated muting sensor signal interrupt	Max. 100 ms, at program 3 <sup>2)</sup>							
Control outputs (X1, X2)								
Number of outputs	2							
Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored							
Output voltage	16 V DC ... 30 V DC							
Output current	Max. 120 mA							
Test pulse width	40 ms (at program 1, 2, 4, 5, 6 and 9 on X1 and X2, at program 3.2 on X1) 52 ms (at program 3.2 on X2)							
Test pulse rate	5 Hz							
Load capacity (test pulse width)	1000 nF (40 ms)							
Safety outputs (Q1, Q2, Q3, Q4)								
Number of outputs	4							
Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored							
Output voltage	18 V DC ... 30 V DC							
Output current	Max. 2 A							
Test pulse width	700 µs							
Test pulse rate	12.5 Hz ... 32 Hz							
Load capacity	1000 nF							
Cable length	100 m (1.5 mm <sup>2</sup> )							
Response time	13 ms ... 79 ms <sup>3)</sup>							
Delay time (outputs Q3/Q4)	-	0 s ... 5 s, adjustable			0 s ... 50 s, adjustable		0 s ... 300 s, adjustable	

<sup>1)</sup> Time between valid muting condition and active muting

<sup>2)</sup> One muting input may be LOW for this time

<sup>3)</sup> Depending on the selected program and the connected sensors



## Functional data

Type	UE410- XU3T0	UE410- XU4T0	UE410- XU3T5	UE410- XU4T5	UE410- XU3T50	UE410- XU4T50	UE410- XU3T300	UE410- XU4T300
Reset/restart	Manual, automatic/configurable							
External device monitoring	✓							
Emergency stop switch	✓							
Logical functions	OR, AND, BYPASS, Muting							
Muting	✓							

## Input expansion unit

## General data

Type	UE410-8DI3	UE410-8DI4
Safety related parameters		
Safety integrity level	SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$3.8 \times 10^{-9}$ <sup>1)</sup> , $7.3 \times 10^{-9}$ <sup>2)</sup> (EN ISO 13849)	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Climate conditions according to	EN 61131-2	
Vibration resistance	5 Hz ... 500 Hz	
Vibration resistance (checked to)	EN 60068-2-6, EN 61131-2	
Enclosure rating	EN/IEC 60529	
Clamps	IP 40	
Housing	IP 20	
Electromagnetic compatibility (EMC)	Class A (EN 61000, EN 55011)	
Protection class	III	
System connection	Cable gland	
Connection type	Plug-in terminals	Dual-level spring clamp terminals
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 96.5 mm x 120.8 mm	
Weight	150 g	

<sup>1)</sup> Dual-channel outputs

<sup>2)</sup> Single-channel outputs

### Electrical data

Type	UE410-8DI3	UE410-8DI4
Power consumption	3 W	
Input circuit (I1 - I8)		
Number of inputs	4 dual-channel or 8 single-channel	
Input voltage HIGH	13 V DC ... 30 V DC	
Input voltage LOW	-5 V ... 5 V DC	
Input current HIGH	2.4 mA ... 3.8 mA	
Input current LOW	-2.5 mA ... 2.1 mA	
Switch-on time	Min. 70 ms	
Synchronous time monitoring	1500 ms (at program 3 and 5)	

### Muting main unit

### General data

Type	UE410-MM3	UE410-MM4
Safety related parameters		
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	$7.9 \times 10^{-9}$ (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Climate conditions according to	EN 61131-2	
Vibration resistance	5 Hz ... 500 Hz	
Vibration resistance (checked to)	EN 60068-2-6, EN 61131-2	
Enclosure rating	EN/IEC 60529	
Clamps	IP 40	
Housing	IP 20	
Electromagnetic compatibility (EMC)	Class A (EN 61000, EN 55011)	
Protection class	III	
System connection	Cable gland	
Connection type	Plug-in terminals	Dual-level spring clamp terminals
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Dimensions (W x H x D)	29 mm x 96.5 mm x 120.8 mm	
Weight	180 g	



## Electrical data

Type	UE410-MM3	UE410-MM4
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)	
Type of supply voltage	PELV (electrical output circuit on UE410-4RO/UE410-2RO > 25 V AC/60 V DC) PELV or SELV (electrical output circuit on UE410-4RO/UE410-2RO < 25 V AC/60 V DC)	
Power consumption	3 W	
Switch-on time	Max. 10 s	
Short-circuit protection	4 A gG (with tripping characteristics B or C)	
Input circuit (I1, I2, EN, S1)		
Number of inputs	1 dual-channel and 4 single-channel	
Input voltage HIGH	15 V DC ... 30 V DC	
Input voltage LOW	-5 V DC ... 5 V DC	
Input current HIGH	3 mA (2.3 mA ... 3.6 mA)	
Input current LOW	-2.5 mA ... 0.15 mA	
Switch-on time	Min. 70 ms	
Number of muting sensors	2, 4	
Muting time to operate	Max. 70 ms	
Tolerated muting sensor signal interrupt	Max. 200 ms <sup>1)</sup>	
Total muting monitoring time	Activation and time adjustable 0.33 min ... 60 min	
Switch-on time ENTER button	3 s <sup>2)</sup>	
Control outputs (X1)		
Number of outputs	1	
Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored	
Output voltage	18 V DC ... 30 V DC	
Output current	Max. 120 mA	
Load capacity	Max. 1000 nF	
Safety outputs (Q1, Q2)		
Number of outputs	2	
Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored	
Output voltage	18 V DC ... 30 V DC	
Output current	Max. 2 A	
Response time	< 13 ms	
Test pulse width	300 µs	
Test pulse rate	5 Hz	
Load capacity	500 nF	
Cable length	100 m (1.5 mm <sup>2</sup> )	
Response time	< 13 ms	

<sup>1)</sup> One muting input may be LOW for this time

<sup>2)</sup> Upon applying the supply voltage

### Functional data

Type	UE410-MM3	UE410-MM4
Reset/restart	Manual, automatic/configurable	
External device monitoring	✓	
Logical functions	Muting, override	
Muting	✓	
Override	✓	
Concurrence monitoring	✓	
Monitoring total muting time	✓	
Sensor gap monitoring	✓	
End of muting by ESPE	✓	

### Muting extension unit

#### General data

Type	UE410-XM3	UE410-XM4
<b>Safety related parameters</b>		
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	7.9 x 10 <sup>-9</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Climate conditions according to	EN 61131-2	
Vibration resistance	5 Hz ... 500 Hz	
Vibration resistance (checked to)	EN 60068-2-6, EN 61131-2	
Enclosure rating	EN/IEC 60529	
Clamps	IP 40	
Housing	IP 20	
Electromagnetic compatibility (EMC)	Class A (EN 61000, EN 55011)	
Protection class	III	
System connection	Cable gland	
Connection type	Plug-in terminals	Dual-level spring clamp terminals
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 96.5 mm x 120.8 mm	
Weight	180 g	





## Electrical data

Type	UE410-XM3	UE410-XM4
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)	
Type of supply voltage	PELV (electrical output circuit on UE410-4RO/UE410-2RO > 25 V AC/60 V DC) PELV or SELV (electrical output circuit on UE410-4RO/UE410-2RO < 25 V AC/60 V DC)	
Power consumption	3 W	
Switch-on time	Max. 10 s	
Short-circuit protection	4 A gG (with tripping characteristics B or C)	
Input circuit (I1, I2, EN, S1)		
Number of inputs	1 dual-channel and 4 single-channel	
Input voltage HIGH	15 V DC ... 30 V DC	
Input voltage LOW	-5 V DC ... 5 V DC	
Input current HIGH	3 mA (2.3 mA ... 3.6 mA)	
Input current LOW	-2.5 mA ... 0.15 mA	
Switch-on time	Min. 70 ms	
Number of muting sensors	2, 4	
Muting time to operate	Max. 70 ms	
Tolerated muting sensor signal interrupt	Max. 200 ms <sup>1)</sup>	
Total muting monitoring time	Activation and time adjustable 0.33 min ... 60 min	
Control outputs (X1)		
Number of outputs	1	
Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored	
Output voltage	18 V DC ... 30 V DC	
Output current	Max. 120 mA	
Load capacity	Max. 1000 nF	
Safety outputs (Q1, Q2)		
Number of outputs	2	
Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored	
Output voltage	18 V DC ... 30 V DC	
Output current	Max. 2 A	
Response time	< 13 ms	
Test pulse width	300 µs	
Test pulse rate	5 Hz	
Load capacity	500 nF	
Cable length	100 m (1.5 mm <sup>2</sup> )	
Response time	< 13 ms	

<sup>1)</sup> One muting input may be LOW for this time

## Functional data

Type	UE410-XM3	UE410-XM4
Reset/restart	Manual, automatic/configurable	
External device monitoring	✓	
Logical functions	Muting, override	
Muting	✓	
Override	✓	
Concurrence monitoring	✓	
Monitoring total muting time	✓	
Sensor gap monitoring	✓	
End of muting by ESPE	✓	

## Muting input expansion unit

### General data

Type	UE410-MDI3	UE410-MDI4
<b>Safety related parameters</b>		
Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
Category	Category 4 (EN ISO 13849)	
Performance level	PL e (EN ISO 13849)	
PFHd (mean probability of a dangerous failure per hour)	6.1 x 10 <sup>-9</sup> (EN ISO 13849)	
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)	
Ambient operating temperature	-25 °C ... +55 °C	
Storage temperature	-25 °C ... +70 °C	
Air humidity from ... to	15 % ... 95 %, non-condensing	
Climate conditions according to	EN 61131-2	
Vibration resistance	5 Hz ... 500 Hz	
Vibration resistance (checked to)	EN 60068-2-6, EN 61131-2	
Enclosure rating	EN/IEC 60529	
Clamps	IP 40	
Housing	IP 20	
Electromagnetic compatibility (EMC)	Class A (EN 61000, EN 55011)	
Protection class	III	
System connection	Cable gland	
Connection type	Plug-in terminals	Dual-level spring clamp terminals
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
Dimensions (W x H x D)	22.5 mm x 96.5 mm x 128.8 mm	
Weight	150 g	

### Electrical data

Type	UE410-MDI3	UE410-MDI4
Power consumption	1.8 W	
<b>Input circuit (C1, CS, OVR)</b>		
Number of inputs	3 single-channel	
Input voltage HIGH	15 V DC ... 30 V DC	
Input voltage LOW	-5 V DC ... 5 V DC	
Input current HIGH	2.3 mA ... 3.6 mA	
Input current LOW	-2.5 mA ... 0.15 mA	
Switch-on time	Min. 50 ms	



## Relay module

## General data

Type	UE410-2R03	UE410-2R04	UE410-4R03	UE410-4R04
<b>Safety related parameters</b>				
<b>Safety integrity level</b>	SIL3 (IEC 61508) <sup>1)</sup> SILCL3 (IEC 62061) <sup>1)</sup>			
<b>Category</b>	Category 4 (EN ISO 13849) <sup>1)</sup>			
<b>Performance level</b>	PL e (EN ISO 13849) <sup>1)</sup>			
<b>PFHd (mean probability of a dangerous failure per hour)</b>	1.2 x 10 <sup>-9</sup> (EN ISO 13849) <sup>2)</sup>			
<b>T<sub>M</sub> (Mission Time)</b>	Depending on load condition and number of switching cycles			
<b>Galvanized decoupling</b>	✓ (supply circuit - output circuit and input circuit - output circuit) - (supply circuit - input circuit)			
<b>Ambient operating temperature</b>	-25 °C ... +55 °C			
<b>Storage temperature</b>	-25 °C ... +70 °C			
<b>Air humidity from ... to</b>	15 % ... 95 %, non-condensing			
<b>Climate conditions according to</b>	EN 61131-2			
<b>Vibration resistance</b>	5 Hz ... 500 Hz			
<b>Vibration resistance (checked to)</b>	EN 60068-2-6, EN 61131-2			
<b>Enclosure rating</b>	EN/IEC 60529			
<b>Clamps</b>	IP 40			
<b>Housing</b>	IP 20			
<b>Electromagnetic compatibility (EMC)</b>	Class A (EN 61131-2, EN 61000-6-2, EN 55011)			
<b>Protection class</b>	III			
<b>System connection</b>	Cable gland			
<b>Connection type</b>	Plug-in terminals	Dual-level spring clamp terminals	Plug-in terminals	Dual-level spring clamp terminals
<b>Connection conductor cross-section</b>	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>			
<b>Dimensions (W x H x D)</b>	22 mm x 96.5 mm x 120.8 mm			
<b>Weight</b>	160 g		190 g	

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored by the Flexi system

<sup>2)</sup> At 4 x 0.75 A (AC 15); for other conditions, see operating instructions

### Electrical data

Type	UE410-2R03	UE410-2R04	UE410-4R03	UE410-4R04
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)			
Type of supply voltage	PELV (electrical output circuit on UE410-4R0/UE410-2R0 > 25 V AC/60 V DC) PELV or SELV (electrical output circuit on UE410-4R0/UE410-2R0 < 25 V AC/60 V DC)			
Power consumption	1.6 W		3.2 W	
Short-circuit protection	6 A gG (per circuit)			
Safety contacts switch-off circuits K1/K2 (13/14 and 23/24)				
Number of N/O contacts	2		4	
Number of application diagnostic outputs	1		2	
Type of output	Potential free, positively guided			
Switching voltage	230 V DC (5 V DC ... 275 V DC) 250 V AC (5 V AC ... 275 V AC)			
Output current	Max. 6 A			
Total current	8 A			
Contact material	AgSnO2			
Surface treatment	Au (1µm)			
Usage category	AC-15/DC-13			
Rated operating current (voltage)	3 A (250 V AC), 3 A (24 V DC)			
Response time	< 30 ms			

### Gateway

#### General data

Type	UE410-PRO3	UE410-PRO4	UE410-DEV3	UE410-DEV4	UE410-CAN3	UE410-CAN4	UE410-EN1	UE410-EN3	UE410-EN4
Ambient operating temperature	-25 °C ... +55 °C								
Storage temperature	-25 °C ... +70 °C								
Air humidity from ... to	15 % ... 95 %, non-condensing								
Climate conditions according to	EN 61131-2								
Vibration resistance	5 Hz ... 500 Hz								
Vibration resistance (checked to)	EN 60068-2-6, EN 61131-2								
Enclosure rating	EN/IEC 60529								
Clamps	IP 40								
Housing	IP 20								
Electromagnetic compatibility (EMC)	Class A (EN 61000, EN 55011)								
Protection class	III								
System connection	Cable gland								
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>								
Dimensions (W x H x D)	22.5 mm x 96.5 mm x 120.8 mm						22.5 mm x 96.5 mm x 114.4 mm	22.5 mm x 96.5 mm x 120.8 mm	
Weight	160 g						140 g	160 g	

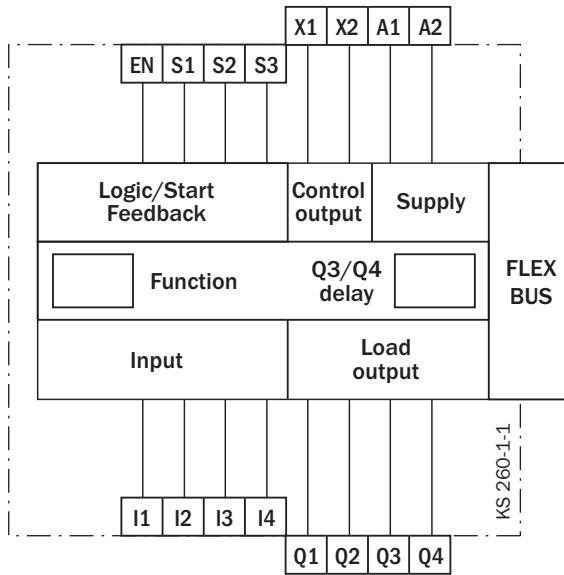


## Electrical data

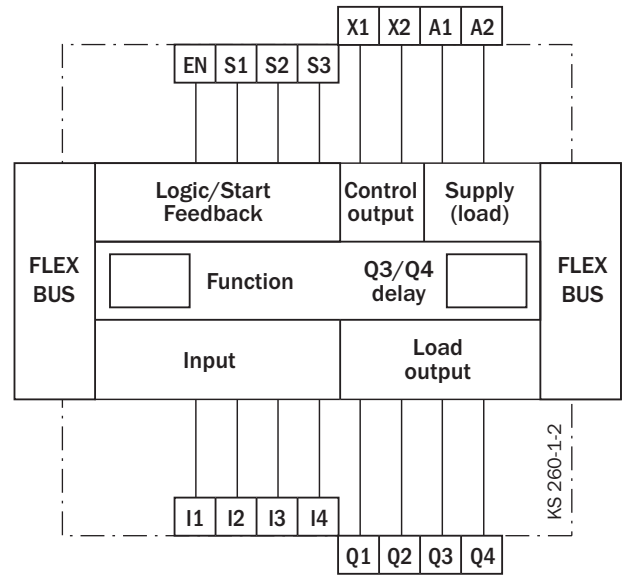
Type	UE410-PRO3	UE410-PRO4	UE410-DEV3	UE410-DEV4	UE410-CAN3	UE410-CAN4	UE410-EN1	UE410-EN3	UE410-EN4
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)								
Power consumption	2.4 W								
Control outputs (X1 - X4)									
Number of outputs	4								
Type of output	PNP semiconductors, short-circuit protected								
Output voltage	18 V DC ... 30 V DC								
Output current	Max. 100 mA								
Load capacity	Max. 100 nF								
Configuration interface	RS-485	ISO-DIS 11898				RJ45			
Fieldbus	PROFIBUS-DP	DeviceNet	CANopen®		Ethernet (TCP/IP), Ether-Net/IP	Ethernet (TCP/IP), Modbus TCP	PROFI-NET IO		
Communication behavior	V0	Group 2 Only Server		-					
Connection type	SUB-D 9-pole, female	Plug-in terminal 5-pole				Socket			
Slave address	0 ... 99	0 ... 63	0 ... 99, adjustable by means of rotary switch		-				
Transmission rate	12 MBaud	125 kbit/s, 250 kbit/s, 500 kbit/s, automatic setting	125 kbit/s, 250 kbit/s, 500 kbit/s, adjustable by means of a DIP switch		-				
Cable length (transmission rate)	1200 m (9.6 kbit/s, 19.2 kbit/s, 93.75 kbit/s), 1000 m (187.5 kbit/s), 400 m (500 kbit/s), 200 m (1500 kbit/s), 100 m (12000 kbit/s)	-		Maximum 100 m per segment					
Delivery status	-				Subnet mask: 255.255.0.0, Default Gateway: 0.0.0.0, IP: 192.168.250.250				

## Internal circuitry

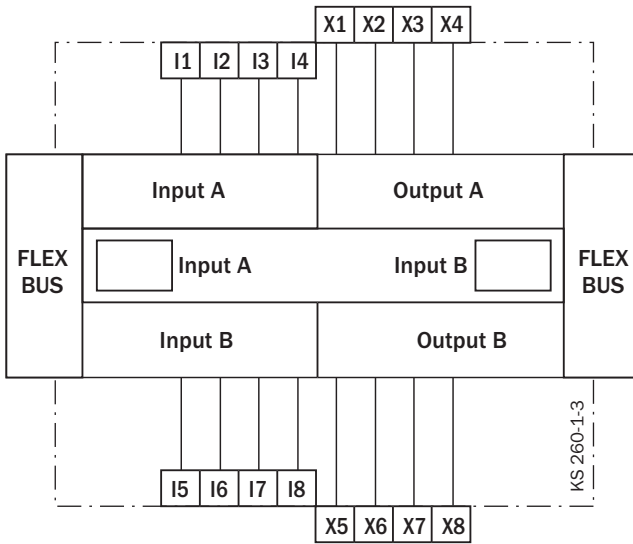
Main unit



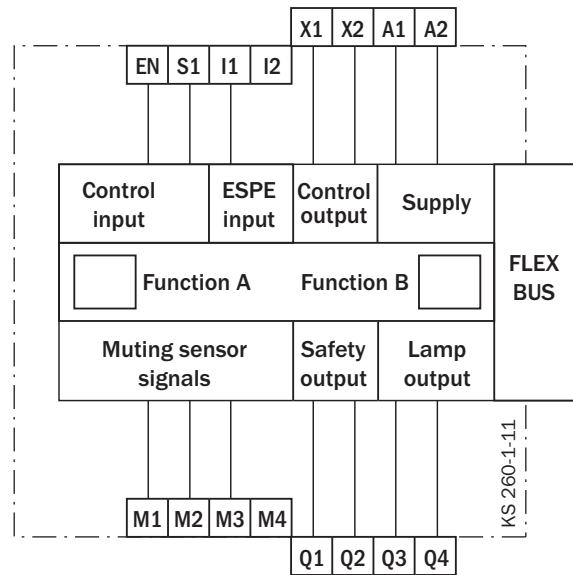
Extension unit



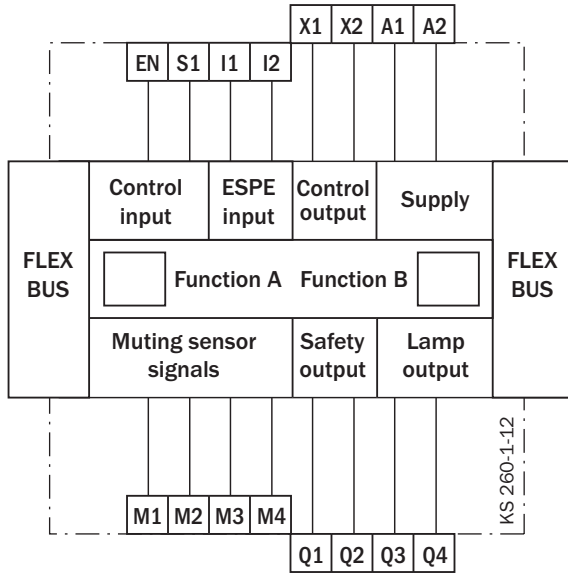
Input expansion unit



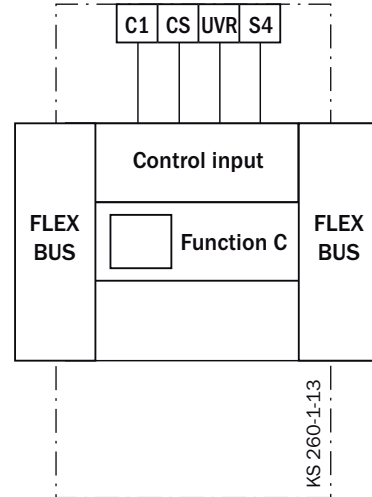
Muting main unit



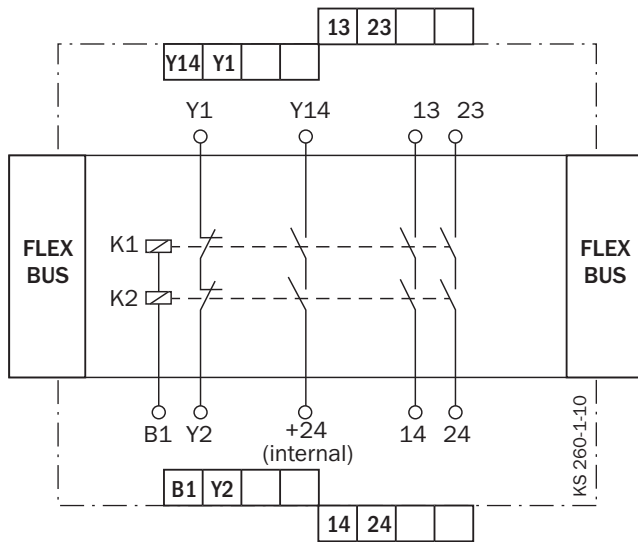
Muting extension unit



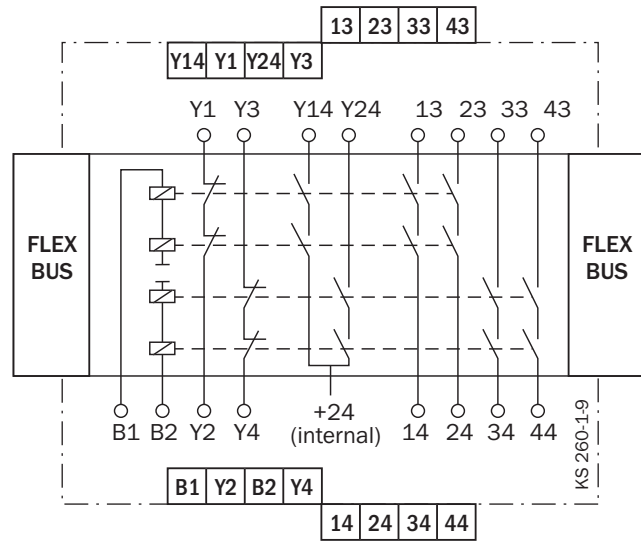
Muting input expansion unit



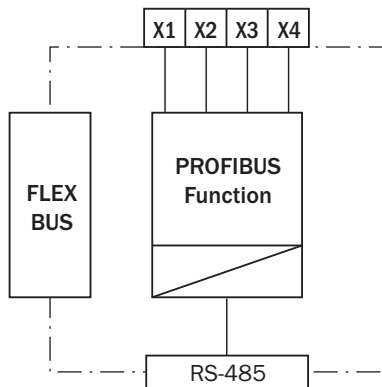
Relay module UE410-2R03, UE410-2R04



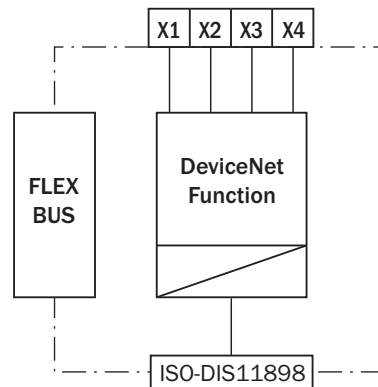
Relay module UE410-4R03, UE410-4R04



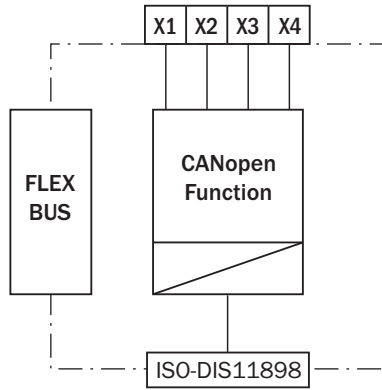
Gateway PROFIBUS-DP



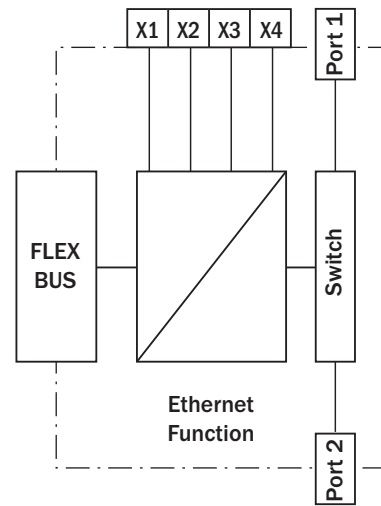
Gateway DeviceNet



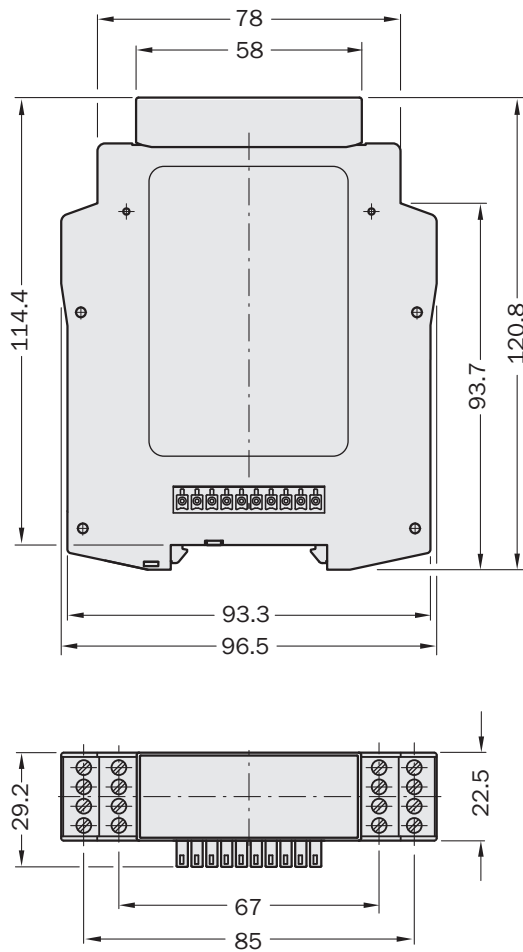
Gateway CANopen®



Gateway Ethernet (TCP/IP), EtherNet/IP, Modbus TCP, PROFINET IO



## Dimensional drawings



Dimensions in mm

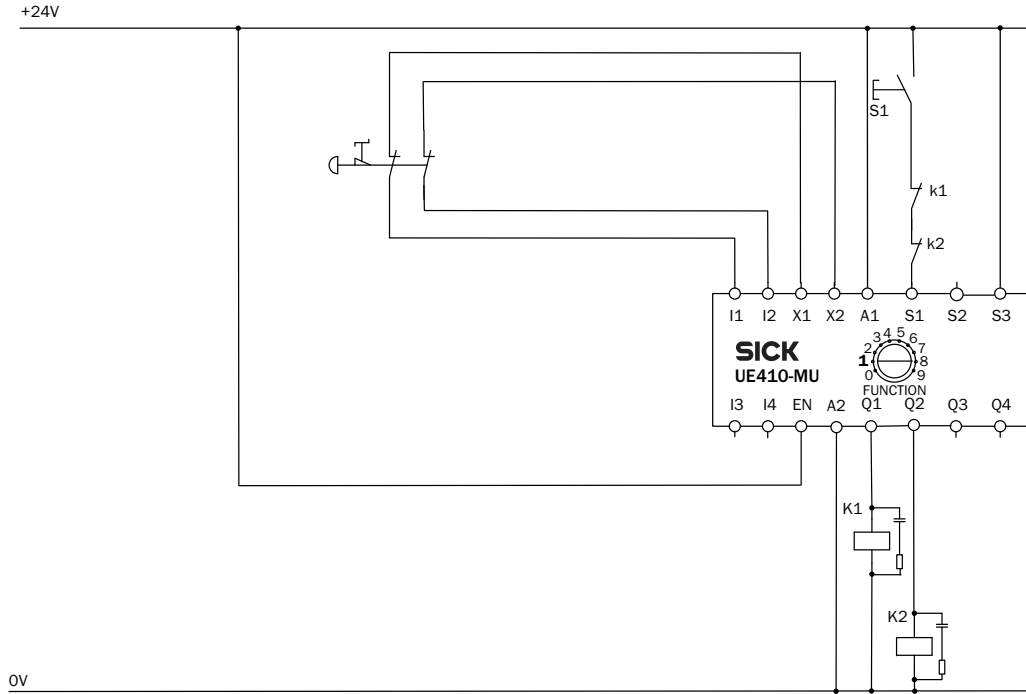




## Connection diagrams

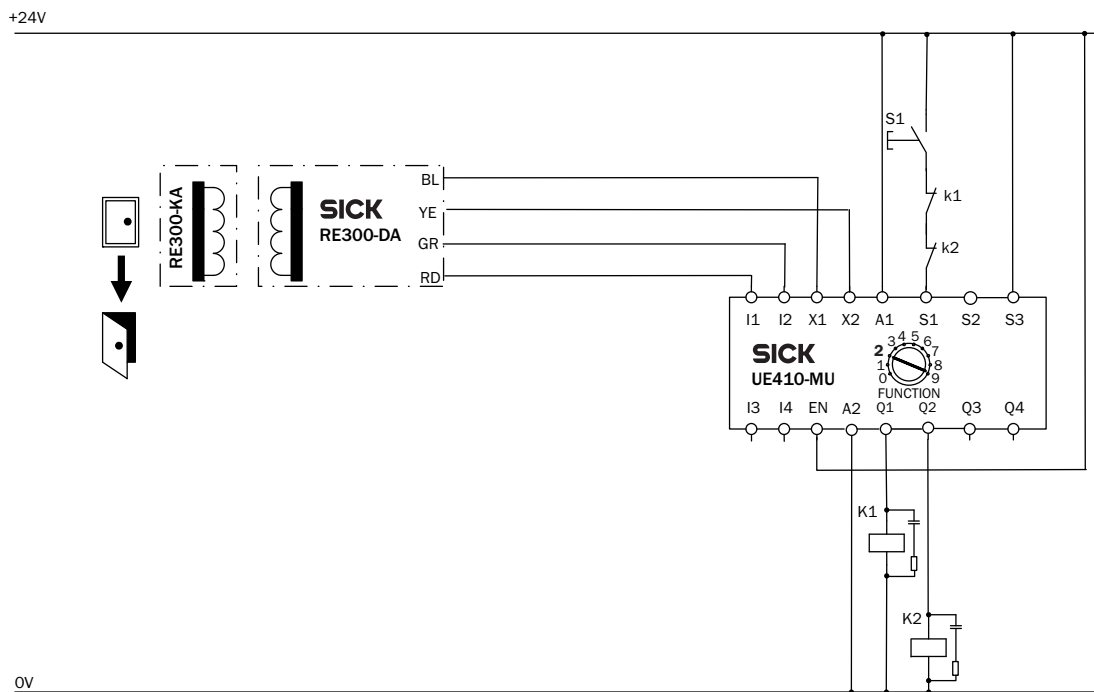
→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Emergency stop on Flexi Classic main module



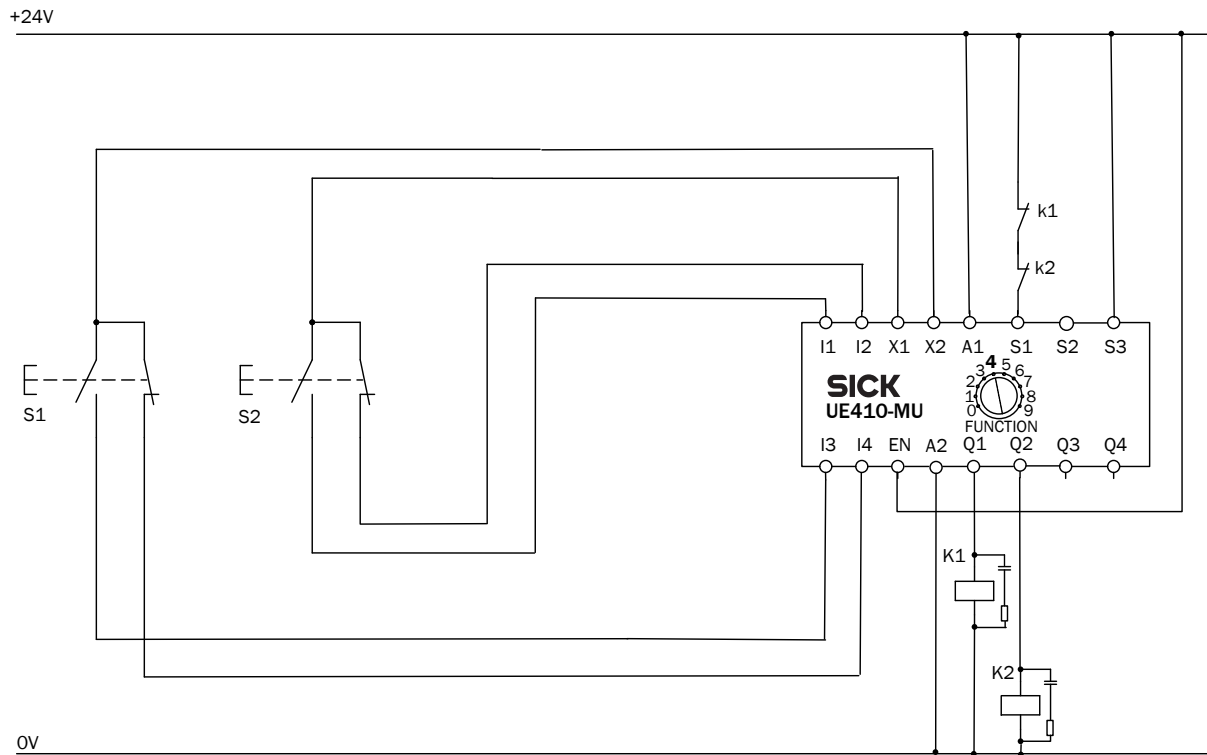
Program 1 with restart interlock and external device monitoring (EDM)

### Non-contact safety switch RE300 on Flexi Classic main module



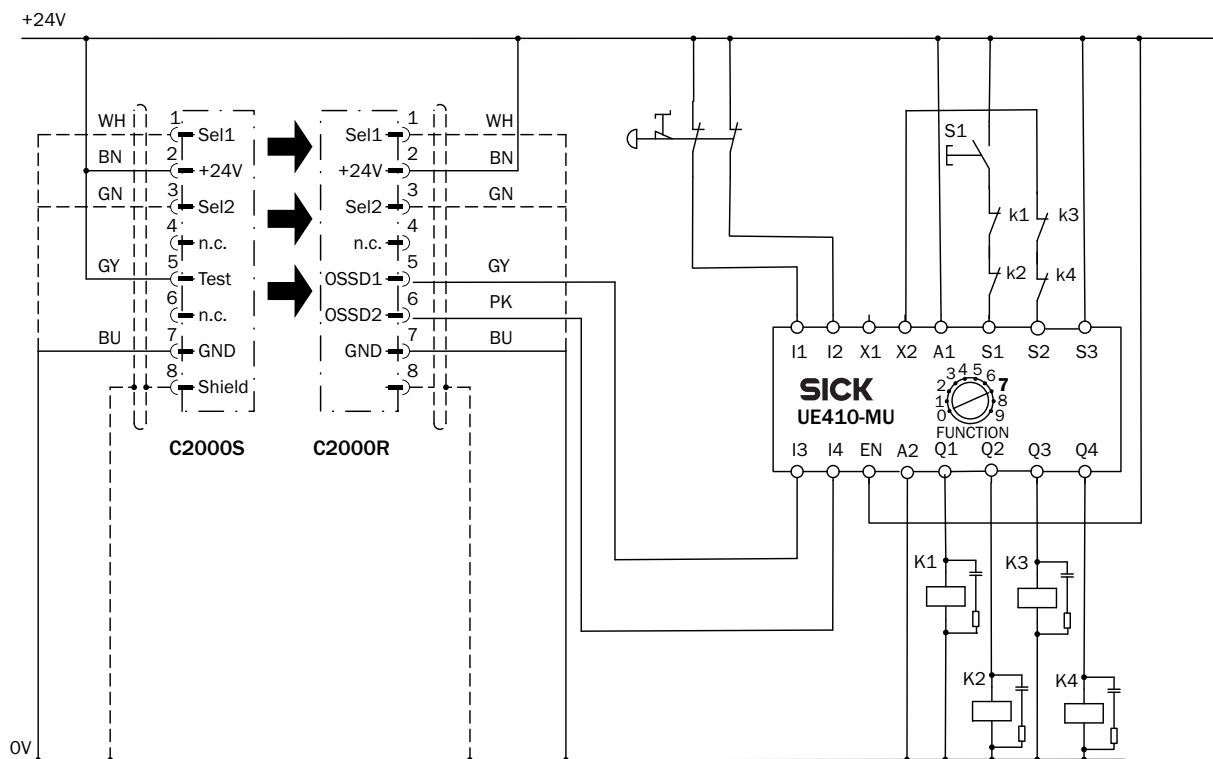
Program 2 with restart interlock and external device monitoring (EDM)

Two-hand control type III C on Flexi Classic main module



Program 4 without restart interlock and with external device monitoring (EDM)

C2000 safety light curtain and emergency stop on Flexi Classic main module




Program 7 with restart interlock and external device monitoring (EDM)

0




## Accessories


### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790

### Muting indicator lamp

Figure	Type of muting indicator	Description	Cable length	Part no.
	LED lamp	Incl. mounting kit, and connection cable	2 m	2019909
			10 m	2019910
	Indicator lamp (bulb)	Incl. mounting kit, connection cable not included	-	2020743

### Master simulator

Figure	Connection type	Fieldbus	Communication behavior	Transmission rate	Type	Part no.
	Terminals, PROFIBUS, SUB-D	PROFIBUS	V0	19.2 kBaud	PR-MSV0	6022458
					PR-MSV1	6022459

## Technical data overview

Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061)
Performance level	PL e (EN ISO 13849)
Number of inputs	0 ... 96, depending on module combination
Number of EFI interfaces	2
Configuration interface	RS-232
Number of outputs	0 ... 48, depending on module combination
Fieldbus (depending on type)	EtherNet/IP, Modbus TCP, PROFIBUS-DP, PROFINET IO
Logical functions	AND, OR, NOT, XNOR, XOR
Safety functions	Emergency stop function, machine control (e.g., PSDI), differentiation between man and material (muting), control functions and operating mode selection

## Product description

Flexi Soft is a programmable and modularly expandable safety controller capable of being integrated into various networks. The main module, FX3-CPU, is the CPU of the entire system. All input signals are monitored and processed via the safety logic stored in the memory plug. These signals are then used to switch system outputs through the FLEX BUS+ interface, which connects all units to one another. Additionally, the FX3-CPU1 main unit has an RS-232 interface that enables the Flexi Soft Designer to upload and change system settings.

The RS-232 port can also be used for permanent diagnosis (i.e., PLC or HMI). Additionally, the FX3-CPU1 main module has 2 EFI connections on it. The FX3-XTIO input/output extension module has 8 safety inputs and 4 safety outputs. The FX3-XTDI input expansion module has 8 safety inputs. Through integrated Flexi Link technology, up to 4 Flexi Soft stations can be linked to one another without any gateways or additional wiring.

## In-system added value

### Usage of enhanced sensor functions through the Enhanced Function Interface (EFI)

EFI is a two-wire communication between safety sensor and controller.

- All EFI sensors connected to the Flexi Soft can be accessed and programmed via the Flexi Soft's RS-232 connection.
- High-quality diagnostics provide fast and accurate results when availability is a priority.

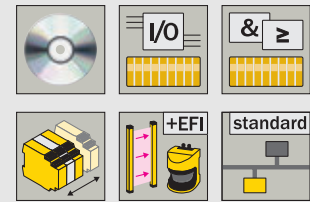
The following enhanced functions are available in combination with the EFI sensor. These functions are dependant on the type of sensor.

- Simultaneous field evaluation
- Field switching
- Decentral diagnostic information via Ethernet, as if one was directly connected to the sensor.
- Evaluation from signals on Flexi Soft or attached network, and safety data forwarding.

Module	Number of inputs	Number of outputs	Number of function blocks	EFI interface	Fieldbus
Main unit	4 EFI inputs (FX3-CPU1)	-	255	2 (FX3-CPU1)	-
Extension unit	8	4	-	-	-
Input expansion unit	8	-	-	-	-
Relay module <sup>1)</sup>	-	2 (UE410-2RO) 4 (UE410-4RO)	-	-	-
Gateway	-	-	-	-	✓ <sup>2)</sup>

<sup>1)</sup> UE10-2FG/UE12-2FG safety relays may be used as an alternative (cf. N-57).

<sup>2)</sup> PROFIBUS-DP, Modbus TCP, EtherNet/IP, PROFINET IO



System plug not included

- System save-in-memory plug for a fast installation
- Modularly expandable (12 to 144 in/outputs)
- Intuitive software: Flexi Soft Designer
- Usage of the enhanced sensor function via EFI interface
- Safe linking of up to 4 Flexi Soft safety controllers



Further information	Page
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→ Internal circuitry	0-33
→ Dimensional drawings	0-35
→ Accessories	0-37
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

### Main unit

Number of EFI interfaces	Type	Part no.
-	FX3-CPU000000 <sup>1)</sup>	1043783
2	FX3-CPU130002 <sup>1)</sup>	1043784

<sup>1)</sup> The system plug has to be ordered separately! (cf. O-37)

### Extension unit

Number of inputs	Number of outputs	Connection type	Type	Part no.
8 single-channel	4 single-channel	Dual-level spring clamp terminals	FX3-XTI084002	1044125

### Input expansion unit

Number of inputs	Connection type	Type	Part no.
8 single-channel	Dual-level spring clamp terminals	FX3-XTDI80002	1044124

### Relay module

Number of N/O contacts	Number of application diagnostic outputs	Connection type	Type	Part no.
2	1	Plug-in terminals	UE410-2R03 <sup>1)</sup>	6026144
		Dual-level spring clamp terminals	UE410-2R04 <sup>1)</sup>	6032677
4	2	Plug-in terminals	UE410-4R03 <sup>1)</sup>	6026143
		Dual-level spring clamp terminals	UE410-4R04 <sup>1)</sup>	6032676

<sup>1)</sup> UE10-2FG/UE12-2FG safety relays may be used as an alternative (cf. (N-57)).

### Gateway

Connection type	Fieldbus	Type	Part no.
Dual-level spring clamp terminals	PROFIBUS-DP	FX0-GPRO00000	1044075
	Modbus TCP	FX0-GMOD00000	1044073
	EtherNet/IP	FX0-GENT00000	1044072
	PROFINET IO	FX0-GPNT00000	1044074

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### Main unit

#### General data

Type	FX3-CPU000000	FX3-CPU130002
<b>Safety related parameters</b>		
<b>Safety integrity level</b>	SIL3 (IEC 61508) SILCL3 (IEC 62061)	
<b>Category</b>	Category 4 (EN ISO 13849)	
<b>Performance level</b>	PL e (EN ISO 13849)	
<b>PFHd (mean probability of a dangerous failure per hour)</b>	1.07 x 10 <sup>-9</sup> (EN ISO 13849)	1.69 x 10 <sup>-9</sup> (EN ISO 13849)
<b>T<sub>M</sub> (Mission Time)</b>	20 years (EN ISO 13849)	
<b>Ambient operating temperature</b>	-25 °C ... +55 °C	
<b>Storage temperature</b>	-25 °C ... +70 °C	
<b>Air humidity from ... to</b>	10 % ... 95 %, non-condensing	
<b>Climate conditions according to</b>	EN 61131-2 (55 °C operating temperature, 95 % rel. humidity)	
<b>Vibration resistance</b>	5 Hz ... 500 Hz	
<b>Vibration resistance (checked to)</b>	EN 61131-2	
<b>Enclosure rating</b>	EN/IEC 60529	
<b>Clamps</b>	IP 40	
<b>Housing</b>	IP 20	
<b>Electromagnetic compatibility (EMC)</b>	Class A (EN 61000-6-2, EN 55011, EN 61131-2 (zone B))	
<b>Protection class</b>	III	
<b>System connection</b>	Plug	
<b>Connection type EFI connection</b>	-	Cable gland, dual-level spring clamp terminals
<b>Connection conductor cross-section</b>	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>	
<b>Dimensions (W x H x D)</b>	22.5 mm x 96.5 mm x 120.8 mm	
<b>Weight</b>	111 g	119 g

#### Electrical data

Type	FX3-CPU000000	FX3-CPU130002
<b>Supply voltage</b>	24 V DC (16.8 V DC ... 30 V DC)	
<b>Type of supply voltage</b>	PELV or SELV (the current of the power supply that powers the main module must be limited to a maximum of 4 A, either through the power supply itself or a fuse.)	
<b>Power consumption</b>	2.5 W	
<b>Short-circuit protection</b>	4 A gG (with tripping characteristics B or C)	
<b>Switch-on time</b>	Min. 18 s	
<b>Number of EFI interfaces</b>	-	2
<b>Configuration interface</b>	RS-232 Internal bus (FLEX BUS+)	

### Functional data

Type	FX3-CPU000000	FX3-CPU130002
Operating mode selector switch		✓
Reset/restart	Manual, automatic/configurable	
External device monitoring		✓
Emergency stop switch		✓
Number of function blocks	255	
Logical functions	AND, OR, NOT, XNOR, XOR	
Safety functions	Emergency stop function, machine control (e.g., PSDI), differentiation between man and material (muting), control functions and operating mode selection	
Application-specific logical functions	Emergency stop, two-hand control, muting, presses, operating mode switch	
Safe device communication via EFI/SDL	-	✓
Safe networking	-	✓
Muting		✓

### Extension unit

#### General data

Safety related parameters		
	Safety integrity level	SIL3 (IEC 61508) SILCL3 (IEC 62061)
	Category	Category 4 (EN ISO 13849)
	Performance level	PL e (EN ISO 13849)
	PFHd (mean probability of a dangerous failure per hour)	$9.0 \times 10^{-10} 1)$ , $4.8 \times 10^{-9} 2)$ (EN ISO 13849)
	T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Ambient operating temperature		-25 °C ... +55 °C
Storage temperature		-25 °C ... +70 °C
Air humidity from ... to		10 % ... 95 %, non-condensing
Climate conditions according to		EN 61131-2 (55 °C operating temperature, 95 % rel. humidity)
Vibration resistance		5 Hz ... 500 Hz
Vibration resistance (checked to)		EN 61131-2
Enclosure rating		EN/IEC 60529
	Clamps	IP 40
	Housing	IP 20
Electromagnetic compatibility (EMC)		Class A (EN 61000-6-2, EN 55011, EN 61131-2 (zone B))
Protection class		III
System connection		Cable gland
Connection type		Dual-level spring clamp terminals
Connection conductor cross-section		Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>
Dimensions (W x H x D)		22.5 mm x 96.5 mm x 120.8 mm
Weight		164 g

<sup>1)</sup> Dual-channel outputs

<sup>2)</sup> Single-channel outputs





## Electrical data

Supply voltage	24 V DC (16.8 V DC ... 30 V DC)																				
Type of supply voltage	PELV or SELV (the current of the power supply that powers the main unit must be limited to a maximum of 4 A, either through the power supply itself or a fuse.)																				
Power consumption	3 W <sup>1)</sup>																				
Short-circuit protection	4 A gG (with tripping characteristics B or C)																				
Input circuit (I1 - I8)	<table border="0"> <tr> <td>Number of inputs</td> <td>8 single-channel</td> </tr> <tr> <td>Input voltage HIGH</td> <td>13 V DC ... 30 V DC</td> </tr> <tr> <td>Input voltage LOW</td> <td>-5 V DC ... 5 V DC</td> </tr> <tr> <td>Input current HIGH</td> <td>3 mA (2.4 mA ... 3.8 mA)</td> </tr> <tr> <td>Input current LOW</td> <td>-2.5 mA ... 2.1 mA</td> </tr> <tr> <td>Switch-on time</td> <td>Min. 18 s</td> </tr> </table>	Number of inputs	8 single-channel	Input voltage HIGH	13 V DC ... 30 V DC	Input voltage LOW	-5 V DC ... 5 V DC	Input current HIGH	3 mA (2.4 mA ... 3.8 mA)	Input current LOW	-2.5 mA ... 2.1 mA	Switch-on time	Min. 18 s								
Number of inputs	8 single-channel																				
Input voltage HIGH	13 V DC ... 30 V DC																				
Input voltage LOW	-5 V DC ... 5 V DC																				
Input current HIGH	3 mA (2.4 mA ... 3.8 mA)																				
Input current LOW	-2.5 mA ... 2.1 mA																				
Switch-on time	Min. 18 s																				
Control outputs (X1, X2)	<table border="0"> <tr> <td>Number of outputs</td> <td>2</td> </tr> <tr> <td>Type of output</td> <td>PNP semiconductors, short-circuit protected, cross-circuit monitored</td> </tr> <tr> <td>Output voltage</td> <td>16 V DC ... 30 V DC</td> </tr> <tr> <td>Output current</td> <td>Max. 120 mA <sup>2)</sup></td> </tr> <tr> <td>Test pulse width</td> <td>1 ms ... 100 ms, configurable</td> </tr> <tr> <td>Test pulse rate</td> <td>1 Hz ... 25 Hz, configurable</td> </tr> <tr> <td>Load capacity (test pulse width)</td> <td>1 µF (4 ms) 0.5 µF (1 ms)</td> </tr> <tr> <td>Cable resistance</td> <td>Max. 100 Ohm</td> </tr> </table>	Number of outputs	2	Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored	Output voltage	16 V DC ... 30 V DC	Output current	Max. 120 mA <sup>2)</sup>	Test pulse width	1 ms ... 100 ms, configurable	Test pulse rate	1 Hz ... 25 Hz, configurable	Load capacity (test pulse width)	1 µF (4 ms) 0.5 µF (1 ms)	Cable resistance	Max. 100 Ohm				
Number of outputs	2																				
Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored																				
Output voltage	16 V DC ... 30 V DC																				
Output current	Max. 120 mA <sup>2)</sup>																				
Test pulse width	1 ms ... 100 ms, configurable																				
Test pulse rate	1 Hz ... 25 Hz, configurable																				
Load capacity (test pulse width)	1 µF (4 ms) 0.5 µF (1 ms)																				
Cable resistance	Max. 100 Ohm																				
Safety outputs (Q1, Q2, Q3, Q4)	<table border="0"> <tr> <td>Number of outputs</td> <td>4</td> </tr> <tr> <td>Type of output</td> <td>PNP semiconductors, short-circuit protected, cross-circuit monitored</td> </tr> <tr> <td>Output voltage</td> <td>16 V DC ... 30 V DC</td> </tr> <tr> <td>Output current</td> <td>Max. 2 A</td> </tr> <tr> <td>Maximum total current</td> <td>3.2 A (55 °C) 4 A (45 °C)</td> </tr> <tr> <td>Test pulse width</td> <td>Max. 650 µs</td> </tr> <tr> <td>Test pulse rate</td> <td>0.8 Hz</td> </tr> <tr> <td>Load capacity</td> <td>0.5 µF</td> </tr> <tr> <td>Cable length</td> <td>100 m (1.5 mm<sup>2</sup>)</td> </tr> <tr> <td>Fast shut-off time</td> <td>8 ms</td> </tr> </table>	Number of outputs	4	Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored	Output voltage	16 V DC ... 30 V DC	Output current	Max. 2 A	Maximum total current	3.2 A (55 °C) 4 A (45 °C)	Test pulse width	Max. 650 µs	Test pulse rate	0.8 Hz	Load capacity	0.5 µF	Cable length	100 m (1.5 mm <sup>2</sup> )	Fast shut-off time	8 ms
Number of outputs	4																				
Type of output	PNP semiconductors, short-circuit protected, cross-circuit monitored																				
Output voltage	16 V DC ... 30 V DC																				
Output current	Max. 2 A																				
Maximum total current	3.2 A (55 °C) 4 A (45 °C)																				
Test pulse width	Max. 650 µs																				
Test pulse rate	0.8 Hz																				
Load capacity	0.5 µF																				
Cable length	100 m (1.5 mm <sup>2</sup> )																				
Fast shut-off time	8 ms																				
Configuration interface	Internal bus (FLEX BUS+)																				

<sup>1)</sup> Via FLEX BUS+ without current on X1 ... X8

<sup>2)</sup> On each test pulse output (X1 or X2). A maximum of 8 testable sensor cascades per module (with max. 30 mA each) are possible. The total current of the Flexi Soft system is limited to a maximum of 1.28 A. This means that, for example, the test pulse outputs are able to supply 32 sensors with 30 mA inputs each and an additional 64 inputs on FX3-XTIO or FX3-XTDI modules.

## Functional data

Operating mode selector switch	✓
Emergency stop switch	✓
Safety functions	Emergency stop function, machine control (e.g., PSDI), differentiation between man and material (muting), control functions and operating mode selection
Fast shut-off	✓



## Input expansion unit

### General data

<b>Safety related parameters</b>		
<b>Safety integrity level</b>		SIL3 (IEC 61508) SILCL3 (IEC 62061)
<b>Category</b>		Category 4 (EN ISO 13849)
<b>Performance level</b>		PL e (EN ISO 13849)
<b>PFHd (mean probability of a dangerous failure per hour)</b>		$4.0 \times 10^{-10}$ (EN ISO 13849)
<b>T<sub>M</sub> (Mission Time)</b>		20 years (EN ISO 13849)
<b>Ambient operating temperature</b>		-25 °C ... +55 °C
<b>Storage temperature</b>		-25 °C ... +70 °C
<b>Air humidity from ... to</b>		10 % ... 95 %, non-condensing
<b>Climate conditions according to</b>		EN 61131-2 (55 °C operating temperature, 95 % rel. humidity)
<b>Vibration resistance</b>		5 Hz ... 500 Hz
<b>Vibration resistance (checked to)</b>		EN 61131-2
<b>Enclosure rating</b>		EN/IEC 60529
	<b>Clamps</b>	IP 40
	<b>Housing</b>	IP 20
<b>Electromagnetic compatibility (EMC)</b>		Class A (EN 61000-6-2, EN 55011, EN 61131-2 (zone B))
<b>Protection class</b>		III
<b>System connection</b>		Cable gland
<b>Connection type</b>		Dual-level spring clamp terminals
<b>Connection conductor cross-section</b>		Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>
<b>Dimensions (W x H x D)</b>		22.5 mm x 96.5 mm x 120.8 mm
<b>Weight</b>		139 g

### Electrical data

<b>Power consumption</b>		5 W
<b>Input circuit (I1 - I8)</b>		
	<b>Number of inputs</b>	8 single-channel
	<b>Input voltage HIGH</b>	13 V DC ... 30 V DC
	<b>Input voltage LOW</b>	-5 V DC ... 5 V DC
	<b>Input current HIGH</b>	3 mA (2.4 mA ... 3.8 mA)
	<b>Input current LOW</b>	-2.5 mA ... 2.1 mA
<b>Control outputs (X1 - X8)</b>		
	<b>Number of outputs</b>	8 <sup>1)</sup>
	<b>Type of output</b>	PNP semiconductors, short-circuit protected, cross-circuit monitored
	<b>Output voltage</b>	16 V DC ... 30 V DC
	<b>Output current</b>	Max. 120 mA <sup>2)</sup>
	<b>Cable resistance</b>	Max. 100 Ohm
<b>Configuration interface</b>		Internal bus (FLEX BUS+)

<sup>1)</sup> With 2 test pulse generators

<sup>2)</sup> On each of two test pulse generators (X1/X3/X5/X7 or X2/X4/X6/X8). A maximum of 8 testable sensor cascades per module (with max. 30 mA each) are possible. The total current of the Flexi Soft system is limited to a maximum of 1.28 A. This means that, for example, the test pulse outputs are able to supply 32 sensors with 30 mA inputs each and an additional 64 inputs on FX3-XTIO or FX3-XTDI modules.

## Functional data

Operating mode selector switch	✓
Emergency stop switch	✓
Safety functions	Emergency stop function, machine control (e.g., PSDI), differentiation between man and material (muting), control functions and operating mode selection

## Relay module

## General data

Type	UE410-2R03	UE410-2R04	UE410-4R03	UE410-4R04
Safety related parameters				
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) <sup>1)</sup>			
Category	Category 4 (EN ISO 13849) <sup>1)</sup>			
Performance level	PL e (EN ISO 13849) <sup>1)</sup>			
PFHd (mean probability of a dangerous failure per hour)	$1.2 \times 10^{-9}$ <sup>2)</sup> (EN ISO 13849)			
T <sub>M</sub> (Mission Time)	Depending on load condition and number of switching cycles			
Galvanized decoupling	✓ (supply circuit - output circuit and input circuit - output circuit) – (supply circuit - input circuit)			
Ambient operating temperature	–25 °C ... +55 °C			
Storage temperature	–25 °C ... +70 °C			
Air humidity from ... to	15 % ... 95 %, non-condensing			
Climate conditions according to	EN 61131-2			
Vibration resistance	5 Hz ... 500 Hz			
Vibration resistance (checked to)	EN 60068-2-6, EN 61131-2			
Enclosure rating	EN/IEC 60529			
Clamps	IP 40			
Housing	IP 20			
Electromagnetic compatibility (EMC)	Class A (EN 61131-2, EN 61000-6-2, EN 55011)			
Protection class	III			
System connection	Cable gland			
Connection type	Plug-in terminals	Dual-level spring clamp terminals	Plug-in terminals	Dual-level spring clamp terminals
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>			
Dimensions (W x H x D)	22 mm x 96.5 mm x 120.8 mm			
Weight	160 g		190 g	

<sup>1)</sup> If the feedback current path Y1 - Y2 (external device monitoring) is monitored by the Flexi system

<sup>2)</sup> At 4 x 0.75 A (AC 15); for other conditions, see operating instructions

### Electrical data

Type	UE410-2R03	UE410-2R04	UE410-4R03	UE410-4R04
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)			
Type of supply voltage	PELV (electrical output circuit on UE410-4R0/UE410-2R0 > 25 V AC/60 V DC) PELV or SELV (electrical output circuit on UE410-4R0/UE410-2R0 < 25 V AC/60 V DC)			
Power consumption	1.6 W		3.2 W	
Short-circuit protection	6 A gG (per circuit)			
Safety contacts switch-off circuits K1/K2 (13/14 and 23/24)				
Number of N/O contacts	2		4	
Number of application diagnostic outputs	1		2	
Type of output	Potential free, positively guided			
Switching voltage	230 V DC (5 V DC ... 275 V DC) 250 V AC (5 V AC ... 275 V AC)			
Output current	Max. 6 A			
Total current	8 A			
Contact material	AgSnO2			
Surface treatment	Au (1µm)			
Usage category	AC-15/DC-13			
Rated operating current (voltage)	3 A (250 V AC), 3 A (24 V DC)			
Response time	< 30 ms			

### Gateway

#### General data

Type	FX0-GPRO00000	FX0-GMOD00000	FX0-GENT00000	FX0-GPNT00000
Ambient operating temperature	-25 °C ... +55 °C			
Storage temperature	-25 °C ... +70 °C			
Air humidity from ... to	10 % ... 95 %, non-condensing			
Climate conditions according to	EN 61131-2 (55 °C operating temperature, 95 % rel. humidity)			
Vibration resistance	5 Hz ... 150 Hz			
Vibration resistance (checked to)	EN 61131-2			
Enclosure rating	EN/IEC 60529			
Clamps	IP 40			
Housing	IP 20			
Electromagnetic compatibility (EMC)	Class A (EN 61000-6-2, EN 55011, EN 61131-2 (zone B))			
Protection class	III			
System connection	Cable gland			
Connection type	Dual-level spring clamp terminals	-		
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.14 mm <sup>2</sup> ... 0.75 mm <sup>2</sup> / fine-wire with terminal crimp according to EN 46288: 1 x 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> or 2 x 0.25 mm <sup>2</sup> ... 0.5 mm <sup>2</sup>			
Dimensions (W x H x D)	22.5 mm x 96.5 mm x 126.5 mm	22.5 mm x 96.5 mm x 120.8 mm		
Weight	186 g			

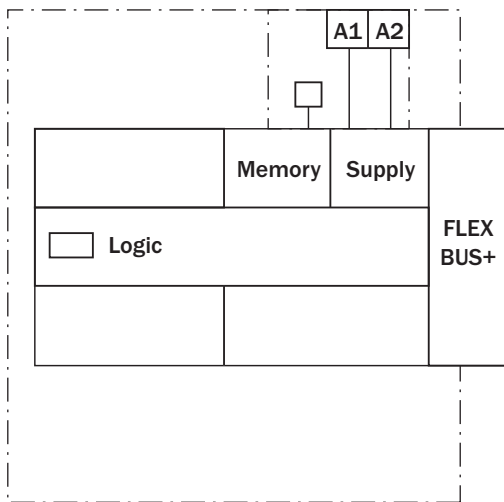


Electrical data

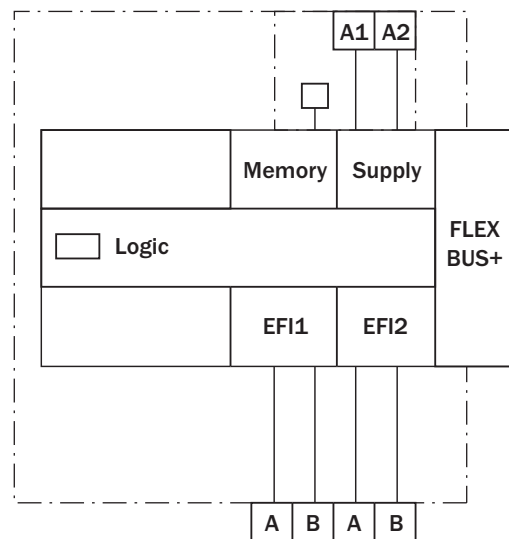
Type	FX0-GPRO00000	FX0-GMOD00000	FX0-GENT00000	FX0-GPNT00000
Supply voltage	24 V DC (19.2 V DC ... 30 V DC)			
Power consumption	2.4 W			
Configuration interface	Internal bus (FLEX BUS+)			
Fieldbus	PROFIBUS-DP	Modbus TCP	EtherNet/IP	PROFINET IO
Communication behavior	Slave	Master/slave operation	Target, Explicit Messaging Only	IO Device, Conformance Class A
Connection type	SUB-D 9-pole, female	RJ45		
Slave address	1 ... 99	-		0 ... 126
Transmission rate	12 MBaud	-		
Delivery status	-	Subnet mask: 255.255.0.0, Default Gateway: 0.0.0.0, IP: 192.168.250.250		

Internal circuitry

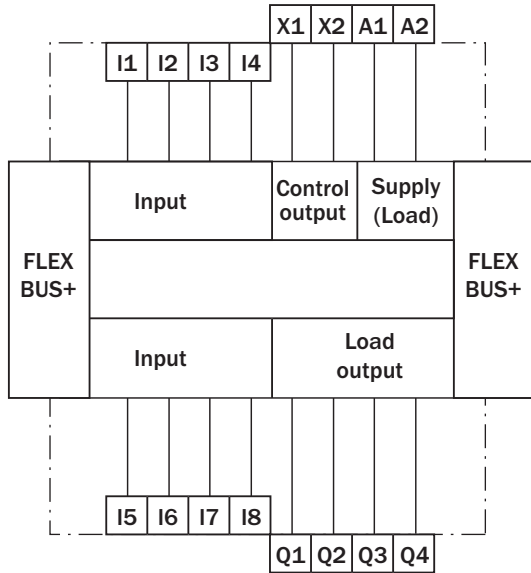
Main unit FX3-CPU000000



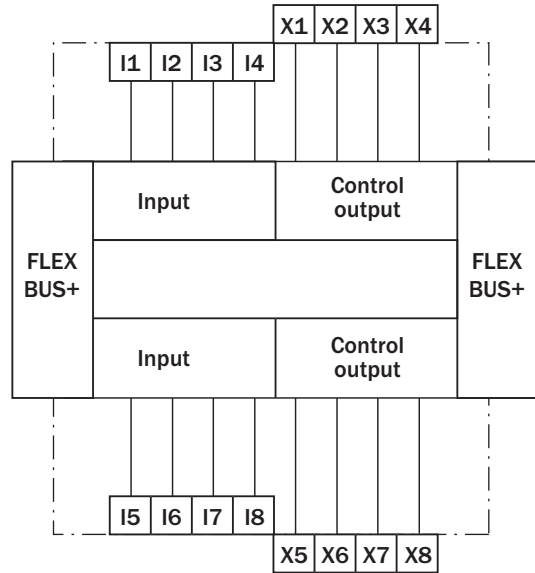
Main unit FX3-CPU130002



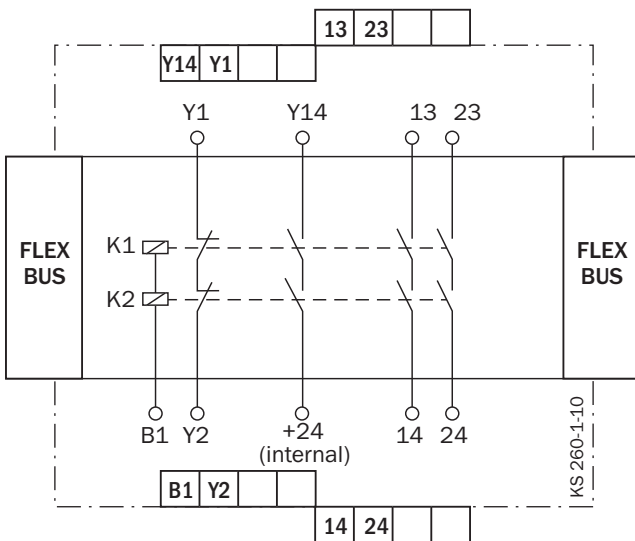
Extension unit FX3-XTI084002



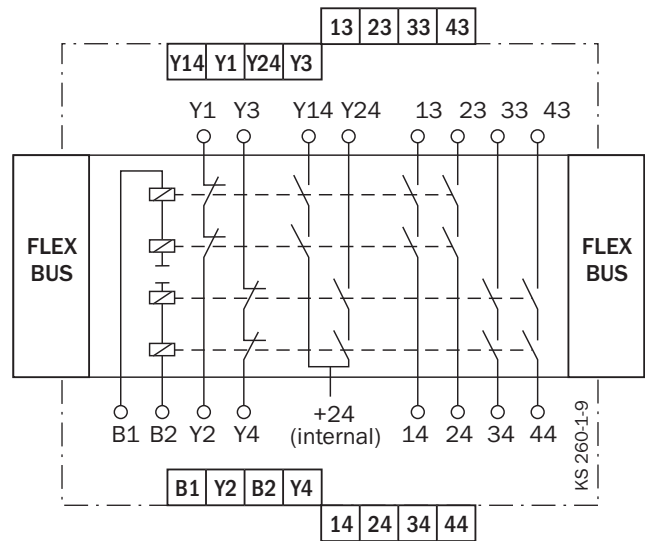
Input expansion unit FX3-XTDI80002



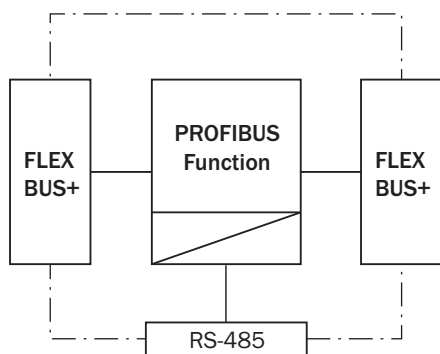
Relay module UE410-2R03, UE410-2R04



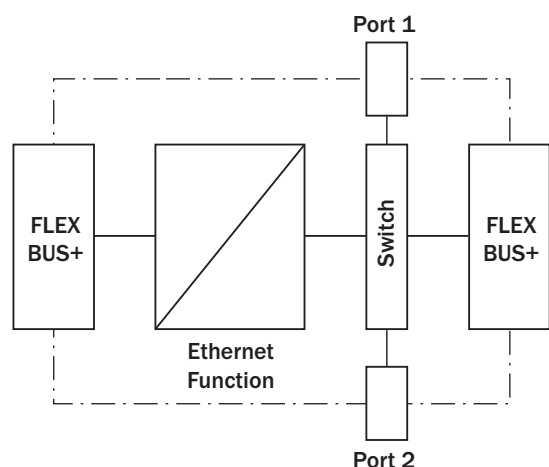
Relay module UE410-4R03, UE410-4R04



Gateway PROFIBUS-DP



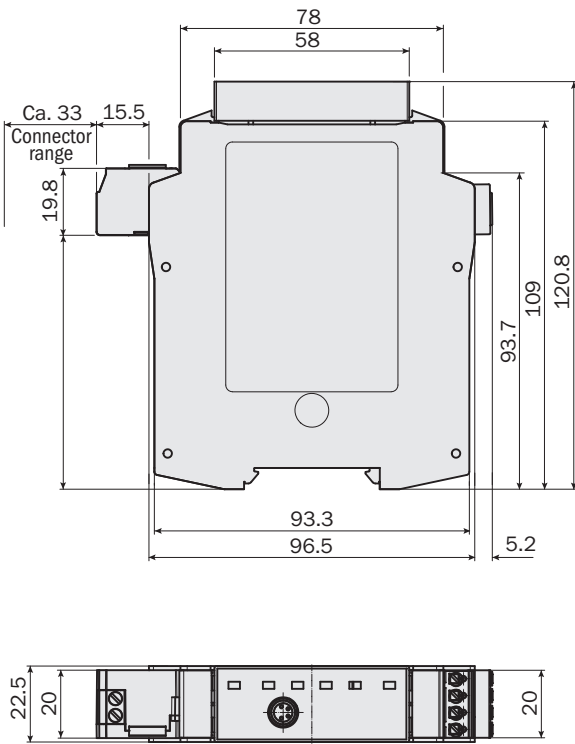
Gateway Modbus TCP, EtherNet/IP, PROFINET IO



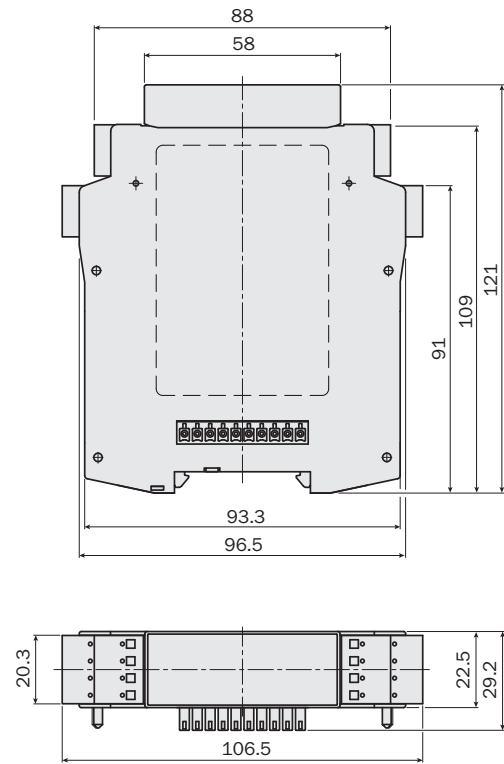
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## Dimensional drawings

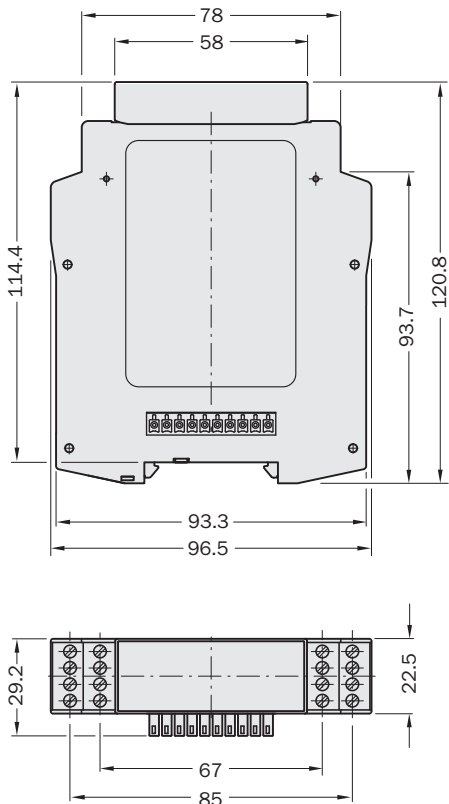
**Main unit FX3-CPU000000, FX3-CPU130002**



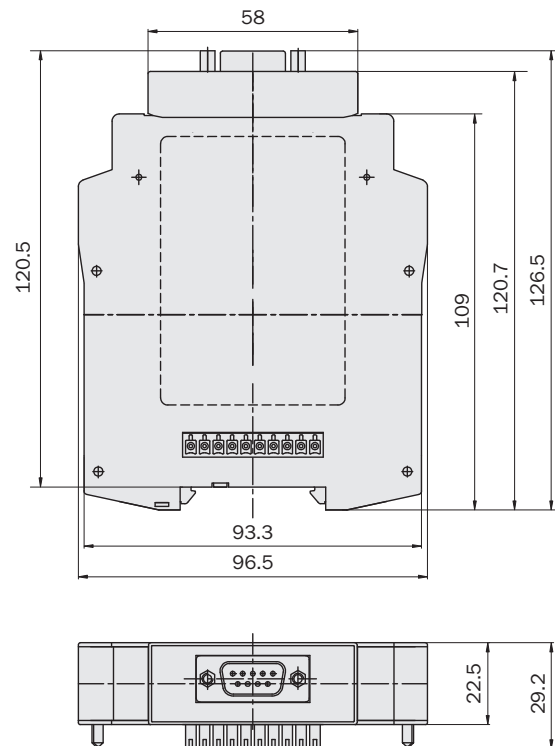
**Extension unit FX3-XTI084002  
Input expansion unit FX3-XTDI80002**



**Relay module UE410-2R03, UE410-2R04, UE410-4R03,  
UE410-4R04**

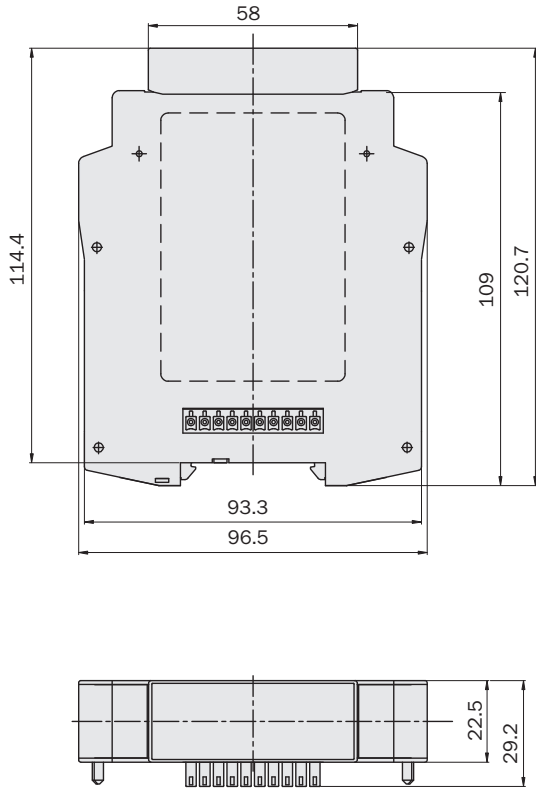


**Gateway FX0-GPRO00000**



Dimensions in mm

Gateway FX0-GMOD00000, FX0-GENT00000, FX0-GPNT00000



Dimensions in mm



## Accessories



### System plug

Integrated configuration memory	Type	Part no.
✓	FX3-MPL000001	1043700


### Connecting cables

Connection type	Cable length	Type	Part no.
Stripped	By the meter	EFI connection cable	6029448

### Configuration connection cables

Figure	Connection type	Cable length	Description	Type	Part no.
	-	2 m	For connecting the configuration connection to the PC	DSL-8D04G02M025KM1	6021195
	Stripped	3 m	For connecting the configuration connection of a PLC	Connection cable	6036342
	-	35 cm	-	Converter RS-232 to USB	6035396


### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789



### Configuration software

Description	Type	Part no.
Flexi Soft Designer	Flexi Soft Designer	2045931

### Muting indicator lamp

Figure	Type of muting indicator	Description	Cable length	Part no.
	LED lamp	Incl. mounting kit, and connection cable	10 m	2019910
			2 m	2019909

### Terminal connectors

Figure	Packing unit	Type	Part no.
	4	Screw terminal connector	2045891
		Terminal plug spring	2045890

# Network solutions

## Technical overview and applications

A distributed system is the best choice if maximum flexibility with minimum overall costs is required. Today, remote solutions must be open, scalable, and expandable. Modern software tools allow the designer to optimize the system and application performance.

Network solutions from SICK permit the integration and evaluation of safety sensors in all the leading industrial bus systems, from complete safety automation with configurable safety controllers to remote safety I/Os. Simple integration of advanced sensors (e.g., safety laser scanners) and advanced diagnostics available over the network provides fast troubleshooting for any application.



### Sensor integration: PROFIsafe and AS-Interface Safety at Work

- Decentralized input modules up to IP 67 for simple remote safety I/O without the need for a control cabinet
- Configuration and diagnostics down to the sensor level
- Provides both safe, unsafe, and diagnostic data over the same bus connection, which reduces costs and the need for additional unsafe I/O

### Complete safety solution: DeviceNet Safety

- Complete safety solution with compact controller and remote I/Os
- Can provide both centralized or decentralized safety control solutions
- Configuration and diagnostics down to the sensor level
- IP 67-rated remote safety controller provides a safety solution without a separate control cabinet

### Utilize additional sensor functionality: EFI gateways

- For configuration and diagnostics between advanced SICK safety sensors and all the leading industrial bus systems
- Provides diagnostic data and for some networks, safe data over the fieldbus for the connected sensors

#### Applications:

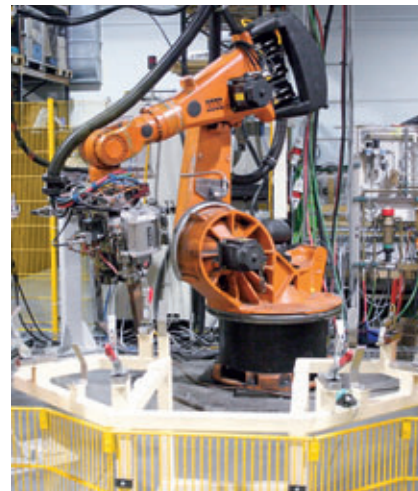
- Storage and conveyor technology
- Car industry
- Packaging industry

#### Applications:

- Storage and conveyor technology
- Robotics
- Handling systems







#### Applications:

- Car industry
- Machine tools



P



	Description	Number of safe inputs single-channel/ dual-channel	Number of safe outputs single-channel/ dual-channel	Enclosure rating	Number of SDL/EFI connections	Function range	Product	Page
	Safety remote I/O	16/8	-	IP 67	2 <sup>1)</sup>	Bi-directional communication <sup>2)</sup>	UE4155	P-2
	EFI gateway	-	-	IP 20	2	Bi-directional communication <sup>2)</sup>	UE4140	P-42
	EFI gateway	-	-	IP 20	2	Bi-directional communication <sup>2)</sup>	UE1140	P-42
	EFI gateway	-	-	IP 20	2	Bi-directional communication <sup>2)</sup>	UE4740	P-42
	Safety slave	2/1	-	IP 65	-	-	UE3212	P-9
				IP 67	-	-	UE4215	P-13
	Flexible safety controller	16/8	8/4	IP 20	-	-	UE4470	P-17
	Safety remote I/O	4/2, 8/4, 12/6	8/4	IP 20	-	-	UE4421	P-24
	Safety remote controller	12/6	-/2	IP 67	2 <sup>1)</sup>	Bi-directional communication <sup>2)</sup>	UE4457	P-32
<b>Ethernet (TCP/IP)</b>	EFI gateway	-	-	IP 20	2	Bi-directional communication <sup>2)</sup>	UE1840	P-42
<b>CANopen</b>	EFI gateway	-	-	IP 20	2	Bi-directional communication <sup>2)</sup>	UE1940	P-42

<sup>1)</sup> ESPE without EFI communication can also be connected to the SDL connection

<sup>2)</sup> Usage of the expanded functions in the connected safety sensors on the SDL/EFI connection; further information → page A-8



- No control cabinet needed
- Central diagnostics
- Less wiring expenditure
- Safety Data Link (SDL) to SICK safety components



## Technical data overview

Fieldbus	PROFIBUS PROFI-safe
Number of safety inputs	8 dual-channel or 16 single-channel
Number of SDL connections	2
Enclosure rating	IP 67
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)

## Product description

- Easy configuration and diagnosis with the aid of Windows-based CDS software (Configuration & Diagnostic Software)
- Offline configuration of the system without FPLC is possible
- Support for PROFI-safe V1.30 (10/2002) and V2.0 (11/2005)
- Support for PROFIBUS DP V1:
  - Cyclic communication with DP-Master Class 1 (central control)
  - Acyclic communication with DP-Master Class 2 (configuration and diagnosis tool)
- 2 SDL connections to connect active SICK safety components
- Configuration and diagnostics of all the components connected to the SDL connection via the configuration connection of the UE4155
- Usage of the expanded functions of the safety components with SICK device communication

## Applications



Further information	Page
→ Dimensional drawings	P-4
→ Device overview and connections	P-5
→ Connection diagrams	P-5
→ Accessories	P-6
→ Systematic safety	A-0
→ Services	B-0

## Ordering information

Description	Number of SDL connections	Safe device communication via EFI/SDL	Items supplied	Type	Part no.
Safety remote I/O	2	✓	Including configuration & diagnostic software and operating instructions on CD-ROM	UE4155-01BC700	1024057

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Fieldbus	PROFIBUS PROFIsafe
Enclosure rating	IP 67
Safety related parameters	
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$1.33 \times 10^{-9}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Supply voltage V <sub>S</sub>	24 V DC (19.2 V DC ... 28.8 V DC) <sup>1)</sup>
Power consumption	Max. 9 A

<sup>1)</sup> The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1.

### Field-signal inputs

Input voltage HIGH	24 V (11 V ... 28.8 V)
Input delay	Configurable, 0 ms ... 90 ms

### Field-signal outputs

Output voltage HIGH	V <sub>S</sub> , without load, switched-on
Switching current	0 mA ... 700 mA
Minimum current for fault monitoring	7 mA ... 40 mA, on field-signal connections 7 and 8, only when the connection is configured as an output for a muting lamp.

### SDL connections

Input current	Max. 1.4 A
Internal resistance	Max. 0.3 Ohm

### OSSD inputs

Input voltage HIGH	24 V (13 V ... 28.8 V)
Test pulse width	Max. 700 µs
Test pulse rate	Max. 500 Hz

### PROFIBUS connection

Baud rate	9.6 kbit/s ... 12 Mbit/s
Address range	3 ... 125
Ident number	071A hex

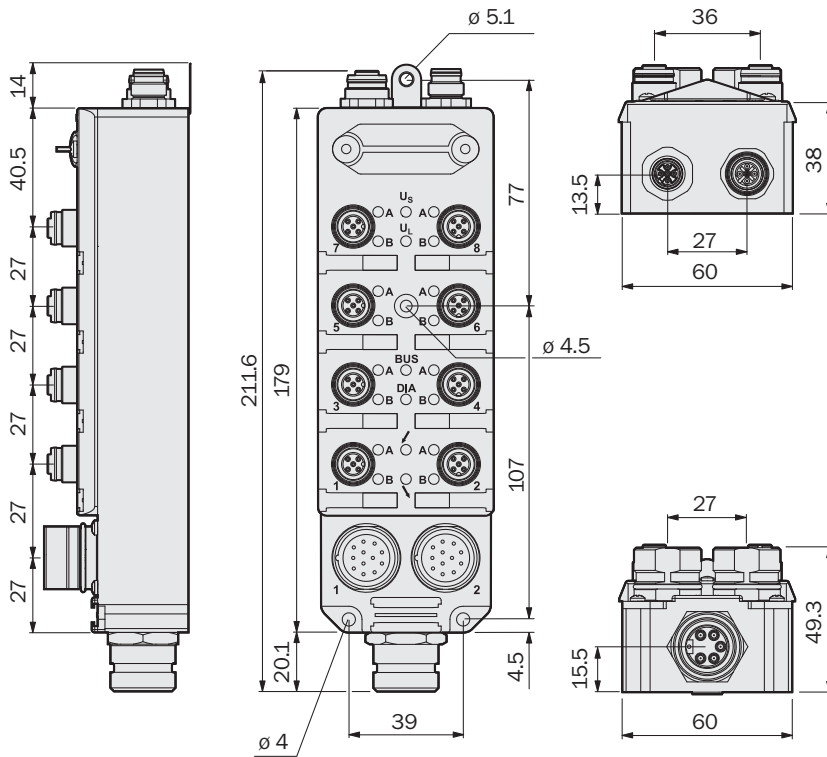
Applications

Safety command devices	✓
Electro-mechanical safety switches	✓
Non-contact safety switches	✓
Opto-electronic protective devices	✓
Two-hand control systems	✓
Operating mode selector switch	✓
Muting sensors	✓
Muting lamp	✓

Functions

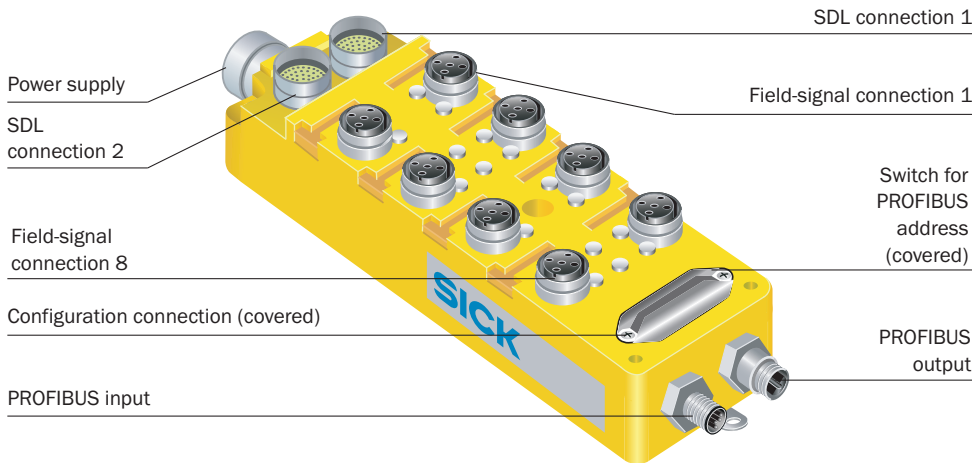
Safe device communication via EFI/SDL	✓
Reset/restart	Manual, automatic/configurable

Dimensional drawings



Dimensions in mm

## Device overview and connections



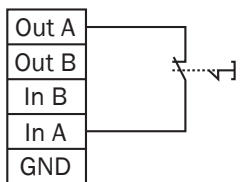
Connection	Function
<b>Power supply</b>	<ul style="list-style-type: none"> <li>Common supply voltage for the bus node and the safety components connected to the SDL and field-signal connections</li> </ul>
<b>SDL connections</b>	<ul style="list-style-type: none"> <li>To connect safety components with SICK device communication and/or OSSDs</li> </ul>
<b>Field-signal connections</b>	<ul style="list-style-type: none"> <li>To connect OSSDs and passive components, e.g., switches fitted with volt-free contacts</li> <li>1 field-signal connection = 2 channels (2 safety inputs and 2 outputs)</li> <li>Connections can be shared by a two-way splitter</li> </ul>
<b>Configuration connection</b>	<ul style="list-style-type: none"> <li>A serial communication port to connect a PC to the module for configuration using SICK CDS software</li> </ul>
<b>PROFIBUS connection</b>	<ul style="list-style-type: none"> <li>Input and output according to PROFIBUS specification</li> </ul>

## Connection diagrams

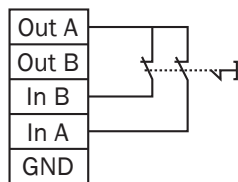
→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Emergency stop, safety door on the field-signal connection

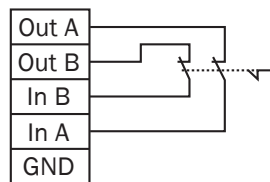
Single-channel



Dual-channel with common testing



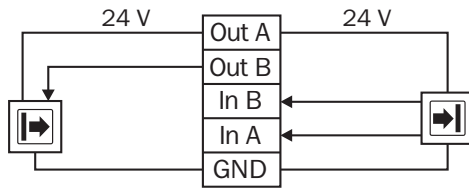
Dual-channel with isolated testing



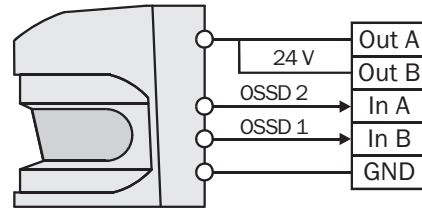
Depending on the required performance level, the emergency stop can be initiated using a single-channel, dual-channel with common testing or dual-channel with isolated testing.

The performance level classification of components with contacts (e.g., safety door switches and emergency stops) depends both on the connection type (single-channel/dual-channel) and on the configuration (single/redundant, testing type). Therefore, the appropriate switching components for the required performance level and switching type must be selected.

### Electro-sensitive protective equipment (ESPE) on the field-signal connection

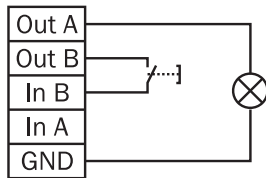


When electro-sensitive protective equipment (ESPE) is connected, the sender and receiver can be used with a system's input and output. Care must be taken to ensure the current consumption of the ESPE is within the rated limits of the output.



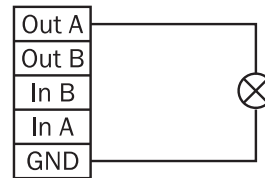
You can use output Out B to test the sender. The switching outputs of the receiver are present on inputs In A and In B.

### Control switch with indicator display on the field-signal connection



The indicator display (Out A) is being controlled via an FPLC.

### Muting lamp on the field-signal connection



When fault monitoring of the muting lamp is required, the muting lamp must be connected to channel A of either output 7 or 8, as only these outputs are capable of monitoring lamp failures.

## Accessories

### Field-signal connection, connecting cables

Figure	Connection type	Direction of cable outlet	Shielded	Cable length	Part no.
	Plug M12 x 5, stripped	Straight	-	2 m	6026133
				5 m	6026134
				10 m	6026135
			✓	2 m	6024860
				5 m	6024861
				10 m	6024862


### Field-signal connection, connectors

Figure	Connection type	Direction of cable outlet	Maximum connection cable cross-section	Shielded	Type	Part no.
	Plug M12 x 5, crewed	Straight	-	✓	Plug	6024741
			0.75 mm <sup>2</sup>	-	STE-1205-G	6022083
		Angled	0.75 mm <sup>2</sup>	-	STE-1205-W	6022082






## Field-signal connection, T-junction

Figure	Connection type	Usage	Type	Part no.
	Plug M12 x 5	For the connection of sender/receiver to an opto-electronic protective device	T-connector	6026517
		For the simultaneous connection of, e.g., two emergency-stop buttons (single-channel) on one field-signal connection	Two-way splitter	6024744

## Field-signal connection, AS-Interface accessories

Figure	Type	Part no.
	DOS-12SK	5309189



## PROFIBUS connection, connectors

Connection type	Direction of cable outlet	Maximum connection cable cross-section	Coding	Shielded	Type	Part no.
-	Straight	-	B-coding	-	PR-STE-END	6021156
Screwed	Straight	0.75 mm <sup>2</sup>	B-coding	✓	PR-STE-1205-G	6021354


## PROFIBUS connection, cable receptacles

Connection type	Direction of cable outlet	Maximum connection cable cross-section	Coding	Shielded	Type	Part no.
Screwed	Straight	0.75 mm <sup>2</sup>	B-coding	✓	PR-DOS-1205-G	6021353


## SDL connection, SDL connection cables

Figure	Connection type	Direction of cable outlet	Description	Shielded	Cable length	Part no.
	Hirschmann cable socket M26 x 11 + FE, Interconnectron plug M23 x 11 + FE	Plug straight/ socket straight	For the connection of safety bus modules to C4000	-	2.5 m	2029131
					5 m	2025634
					10 m	2025635
					15 m	2025636
	Interconnectron plug M23 x 12, stripped	Straight	For the connection of safety bus modules to S3000	✓	2.5 m	2029337
					5 m	2029338
					10 m	2029339
					15 m	2029340


## SDL connection, connector

Figure	Connection type	Maximum connection cable cross-section	Type	Part no.
	Interconnectron plug M23 x 12, crimped	0.82 mm <sup>2</sup>	Interconnectron plug	6024742

**SDL connection, protective cap**

Figure	Type	Part no.
	Protective cap	5310774

**Configuration connection cable**

Figure	Connection type	Cable length	Type	Part no.
	Connector RS-232, USB	35 cm	Converter RS-232 to USB	6035396


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314


**Designation plates**

Figure	Description	Packing unit	Part no.
	In the 9 x 20 mm frame	40	5310775

**Power supply, cable receptacles**

Figure	Connection type	Direction of cable outlet	Type	Part no.
	Screwed	Straight	Socket	6024745

**Configuration connection, configuration connection cables**

Figure	Description	Connection type	Cable length	Type	Part no.
	For connecting the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649

## Technical data overview

Fieldbus	AS-Interface Safety at Work
Component	Safety slave
Type of output of connectable safety sensors	Positively driven safety contacts
Enclosure rating	IP 65
Safety integrity level	SIL2 (IEC 61508)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)

## Product description

- Connection for different switches fitted with volt-free contacts
- AS-Interface (yellow AS-Interface cable)
- AS-Interface version 2.1

## Applications



## Ordering information

Type	Part no.
UE3212-10CA200	1025814



- No control cabinet needed
- Less wiring expenditure



Further information	Page
→ Technical specifications	P-10
→ Dimensional drawings	P-11
→ Device overview and connections	P-11
→ Connection diagrams	P-11
→ Accessories	P-12
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Fieldbus	AS-Interface Safety at Work
Enclosure rating	IP 65 (EN 60529)
Safety related parameters	
Safety integrity level	SIL2 (IEC 61508)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$1.07 \times 10^{-7}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	10 years (EN ISO 13849)
Power consumption	Max. 70 mA
Response time	4 ms

### AS-Interface Safety at Work

AS-Interface profile	S-7.B.O.
Supply voltage V <sub>S</sub>	26.5 V DC ... 31.6 V DC
AS-Interface version	2.1
Data bits IN	
Input channel I1	AS-Interface Safety at Work code sequence on D0, D1
Input channel I2	AS-Interface Safety at Work code sequence on D2, D3
Data bits OUT	
LED alarm	D0
Not used	D1, D2, D3 (any)

### Socket I1/2

Opening time	Min. 43 ms
Cable length	Max. 5 m

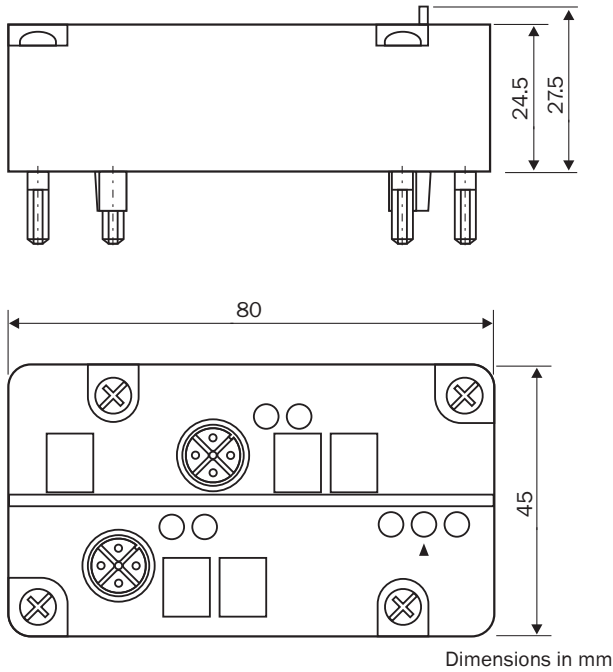
### Applications

Safety command devices	✓
Electro-mechanical safety switches	✓
Opto-electronic protective devices	-

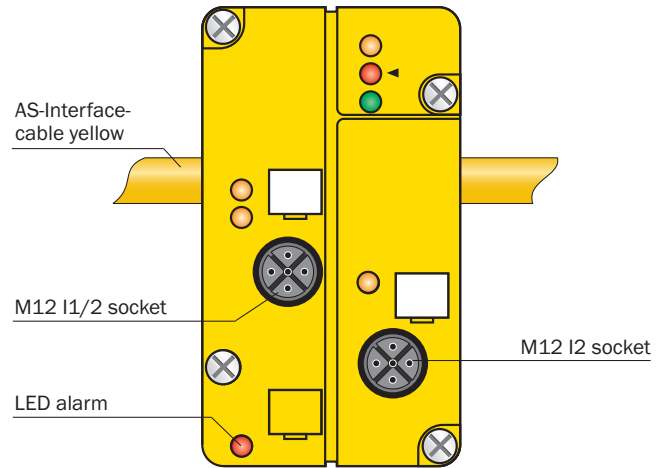
### Functions

Safe device communication via EFI/SDL	-
Reset/restart	Manual, automatic/configurable

## Dimensional drawings



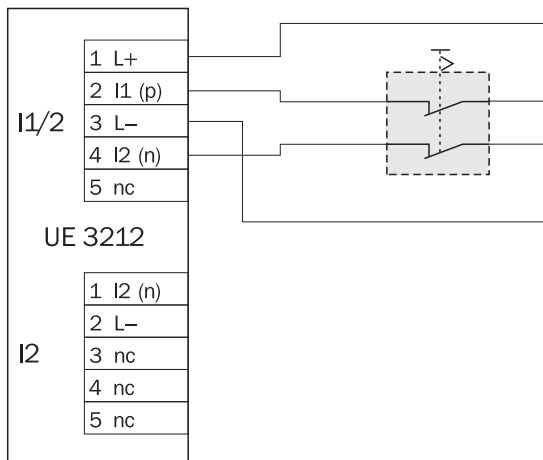
## Device overview and connections



## Connection diagrams

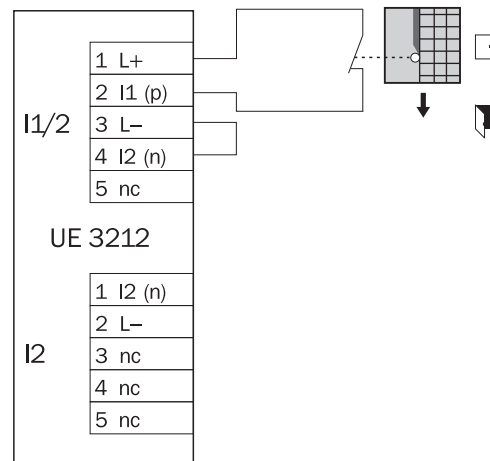
→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Connection of a dual-channel emergency stop pushbutton



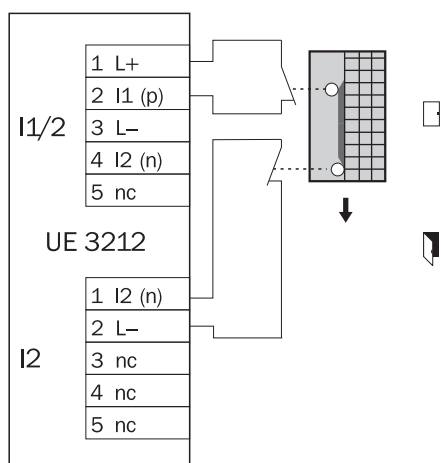
Monitoring block to be selected in the safety monitor "two-channel positively driven"

### Connection of a single-channel safety door



Monitoring block to be selected in the safety monitor "two-channel independent"

## Connection of a dual-channel safety door



Monitoring block to be selected in the safety monitor  
"two-channel dependent"

## Accessories

### Connecting cables

Figure	Connection type	Direction of cable outlet	Cable length	Part no.
	Plug M12 x 5	Straight	2 m	6026133
			5 m	6026134

### Connectors

Figure	Connection type	Direction of cable outlet	Maximum connection cable cross-section	Coding	Type	Part no.
	Plug M12 x 4	Angled	-	Only in conjunction with round plug connectors	STE-1204-W	6022084
		Straight			STE-1204-G	6009932
	Plug M12 x 5	Straight	0.75 mm <sup>2</sup>	-	STE-1205-G	6022083
		Angled			STE-1205-W	6022082

### AS-Interface accessories

Figure	Addressing	Type	Part no.
	Without addressing socket	ASI-FK	6022394
	By addressing socket	ASI-FK-A	6022396

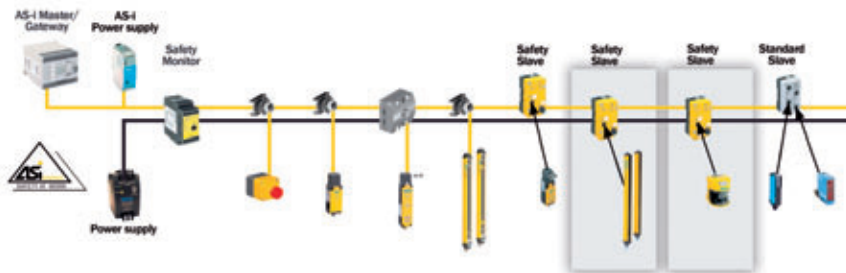
## Technical data overview

Fieldbus	AS-Interface Safety at Work
Component	Safety slave
Type of output of connectable safety sensors	OSSD
Enclosure rating	IP 67
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)

## Product description

- Connection for electro-sensitive protective equipment (ESPE) with self-monitoring semiconductor outputs (OSSDs)
- Connection for the sender unit and the receiver unit of an ESPE system
- AS-interface (yellow AS-interface cable)
- External power supply for ESPE over 24 V ribbon cable (black AS-interface cable)
- AS-interface version 2.1

## Applications



## Ordering information

Type	Part no.
UE4215-14CA200	1025687



- No control cabinet needed
- Less wiring expenditure



Further information	Page
→ Technical specifications	P-14
→ Dimensional drawings	P-15
→ Device overview and connections	P-15
→ Connection diagrams	P-15
→ Accessories	P-16
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Fieldbus	AS-Interface Safety at Work
Enclosure rating	IP 67 (EN 60529)
Safety related parameters	
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$9.0 \times 10^{-9}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Power consumption	Max. 60 mA
Response time	22 ms

### AS-Interface Safety at Work

AS-Interface profile	S-O.B.E
Supply voltage V <sub>S</sub>	26.5 V DC ... 31.6 V DC
AS-Interface version	2.1
Data bits IN	
Input channel I1	AS-Interface Safety at Work code sequence on D0, D1
Input channel I2	AS-Interface Safety at Work code sequence on D2, D3
Data bits OUT	Not used

### Socket I1/2

Output current Pin 1 (AUX L+)	Max. 1.4 A
OSSD inputs	
Input voltage HIGH	24 V (13.5 V ... 28.8 V)
Test pulse rate	0 Hz ... 25 Hz
Test pulse width	0 μs ... 550 μs
Opening time	Min. 51 ms
Cable capacitance	Max. 100 pF

### AUX PWR

Supply voltage V <sub>S</sub>	24 V (16.8 V ... 28.8 V)
ESPE sender total output current (AUX L+)	Max. 1.4 A

### Applications

Safety command devices	-
Electro-mechanical safety switches	-
Opto-electronic protective devices	✓

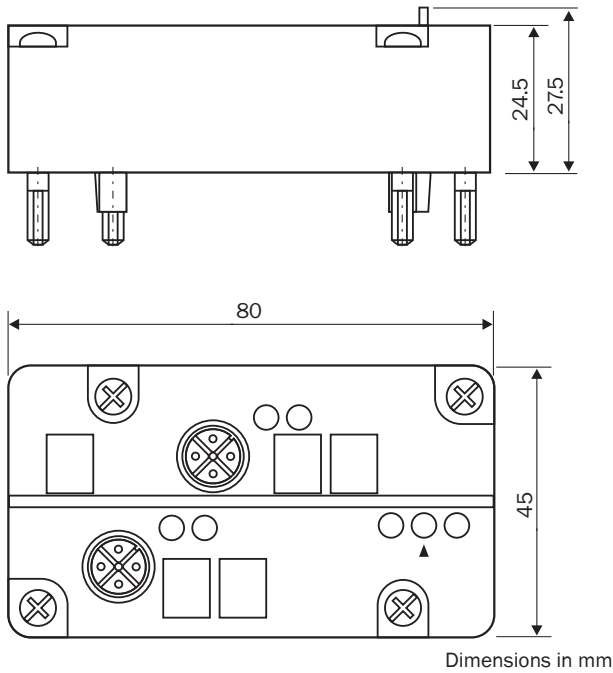
### Functions

Safe device communication via EFI/SDL	-
Reset/restart	Manual, automatic/configurable

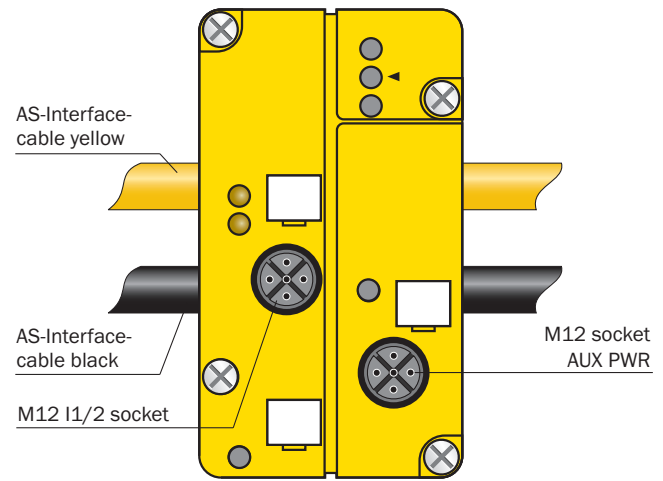




## Dimensional drawings



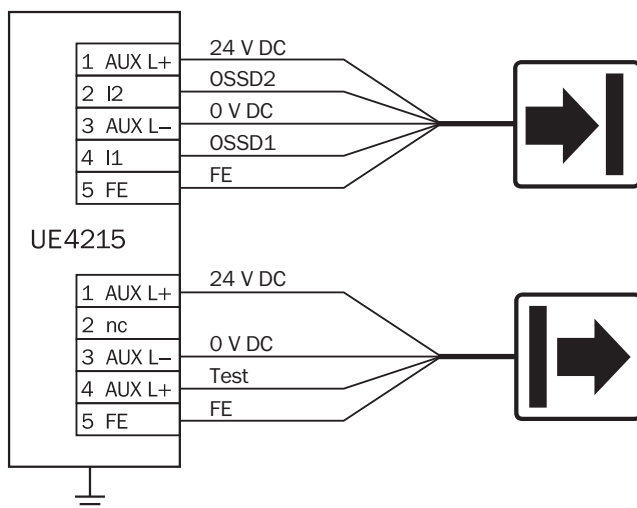
## Device overview and connections



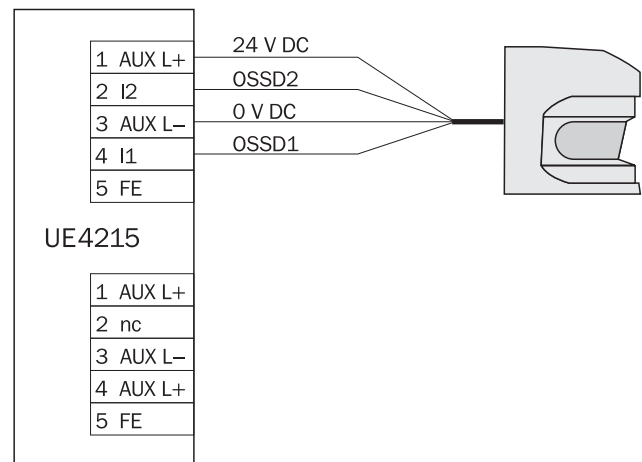
## Connection diagrams

→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Connection of safety light curtains with self-monitored semiconductor outputs (OSSDs)

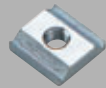


### Connection of a safety laser scanner






## Accessories



### Sliding nuts

Figure	Description	Type	Part no.
	For functional earthing of the MSL, C2000, M2000 or C4000 when using the AS-interface module lower parts FKE or FKE-A	Claw sliding nut	4031411

### Connecting cables

Figure	Connection type	Direction of cable outlet	Description	Shielded	Cable length	Type	Part no.
	M12 x 7 + FE	Straight	Connecting cable with cable socket, e.g., C2000, M2000	✓	2.5 m	DOL-127SG2M5E25KM0	6020537
					5 m	DOL-127SG05ME25KM0	6020354
					7.5 m	DOL-127SG7M5E25KM0	6020353
					10 m	DOL-127SG10ME25KM0	6020352
	Plug M12 x 5	Straight	-	-	2 m	Connection cable	6026133
					5 m	Connection cable	6026134
					10 m	Connection cable	6026135
	Plug M12 x 5, Hirschmann cable socket M26 x 11 + FE	Plug straight/ socket straight	Connection of UE4215 with e.g., C4000, M4000	-	2 m	Connection cable	2030357
					5 m	Connection cable	2030365
					10 m	Connection cable	2030366

### Connectors

Figure	Connection type	Maximum connection cable cross-section	Direction of cable outlet	Type	Part no.
	Plug M12 x 5	0.75 mm <sup>2</sup>	Straight	STE-1205-G	6022083
			Angled	STE-1205-W	6022082

### AS-Interface accessories

Figure	Addressing	Type	Part no.
	Without addressing socket	ASI-FKE	6022395
	By addressing socket	ASI-FKE-A	6022397
		ASI-FKE-A-E	6025058

## Technical data overview

Fieldbus	DeviceNet Safety
Number of safety inputs	8 dual-channel or 16 single-channel
Number of outputs	4 dual-channel or 8 single-channel
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)

## Product description

SICK's UE4470 flexible safety controller integrates and evaluates any combination of safety input and actuator devices into DeviceNet Safety™ networks using local or remote safety capable inputs and outputs. Safety devices can now be logically combined for coherent machine safety control strategies. Applications include packaging machinery, robot cells, machine tools and transfer lines.

Status, diagnostic and error information can be easily accessed locally or through the network. Integrated basic and application-specific function blocks are provided for simple and complex control capability. Logical operations include but are not limited to: AND, OR, Exclusive OR, Exclusive NOR, NOT, ON-delay timer, OFF-delay timer, restart interlock, external device monitoring (EDM), emergency stop, safety gate monitoring, ESPE/AOPD (e.g., safety light curtain), enabling switch, two-hand control, automatic reset, and operating mode selector switch.

## Applications



## Ordering information

Functionality	Number of safety inputs	Number of test/signal outputs (with current monitoring)	Type	Part no.
Flexible safety controller	8 dual-channel or 16 single-channel	4 (0)	UE4470-22EE690	1028312



- Local/remote connection of safety sensors and actuators
- Decentralized evaluation of safety sensors and actuators
- Easy upgrade of installed sensors and actuators
- Logical combinations between sensors and actuators
- Large library of approved safety function blocks
- Remote configuration of other DeviceNet Safety™ devices via network



Further information	Page
→ Technical specifications	P-18
→ Dimensional drawings	P-20
→ Device overview and connections	P-21
→ Internal circuitry	P-22
→ Accessories	P-23
→ Systematic safety	A-0
→ Services	B-0

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Fieldbus	DeviceNet Safety
Safety related parameters	
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$4.2 \times 10^{-10}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Supply voltage V <sub>S</sub>	20.4 V DC ... 26.4 V DC
Connection type supply voltage	Spring terminal plug
Ambient operating temperature from ... to	-10 °C ... +55 °C
Enclosure rating	IP 20
Protection class	III (EN 61140)
Vibration resistance	0.35 mm, 10 Hz ... 57 Hz, 50 m/sec <sup>2</sup> , 57 Hz ... 150 Hz (IEC 60068-2-6)
Shock resistance	150 m/sec <sup>2</sup> , 11 ms (IEC 60068-2-27)
Assembly	35 mm top-hat rail according to IEC 60715
Weight	460 g

### Field signal connections

Connection type	Spring terminal plug
Number of safety inputs	8 dual-channel or 16 single-channel
Type of output on the field signal input	PNP or contact
Input voltage HIGH	11 V DC ... 30 V DC
Input voltage LOW	-30 V DC ... 5 V DC
Input current HIGH	3 mA ... 7 mA
Input delay	Configurable, 0 ms ... 126 ms
Safety outputs	
Number of outputs	4 dual-channel or 8 single-channel
Type of output	Current sourcing (PNP)
Switching current	Max. 500 mA
Leakage current	0.1 mA
Test/signal outputs	
Number of test/signal outputs (with current monitoring)	4 (0)
Output current per channel	700 mA
Leakage current	Max. 0.1 mA

### DeviceNet Safety network connections

Number of safety target connections	Max. 4
Expected packet interval (EPI) setting	Minimum device cycle time
Single cast I/O support	16 Bytes/16 Bytes
Multi cast I/O support	16 Bytes/16 Bytes



**DeviceNet network connections**

Poll connection maximum I/O transmission rate	16 Bytes/16 Bytes
Number of standard slave connections	Max. 2
Number of UCMM clients	8, open connections
Number of UCMM server	Max. 5
Connection type	Spring terminal plug
DeviceNet communication rate	125 kbit/s, 250 kbit/s, 500 kbit/s, Autobaud detection
DeviceNet communication rate setting method	DIP switch
DeviceNet addressing	Via the safety network configuration tool (e.g., SICK DeviceNet Safety Configurator)

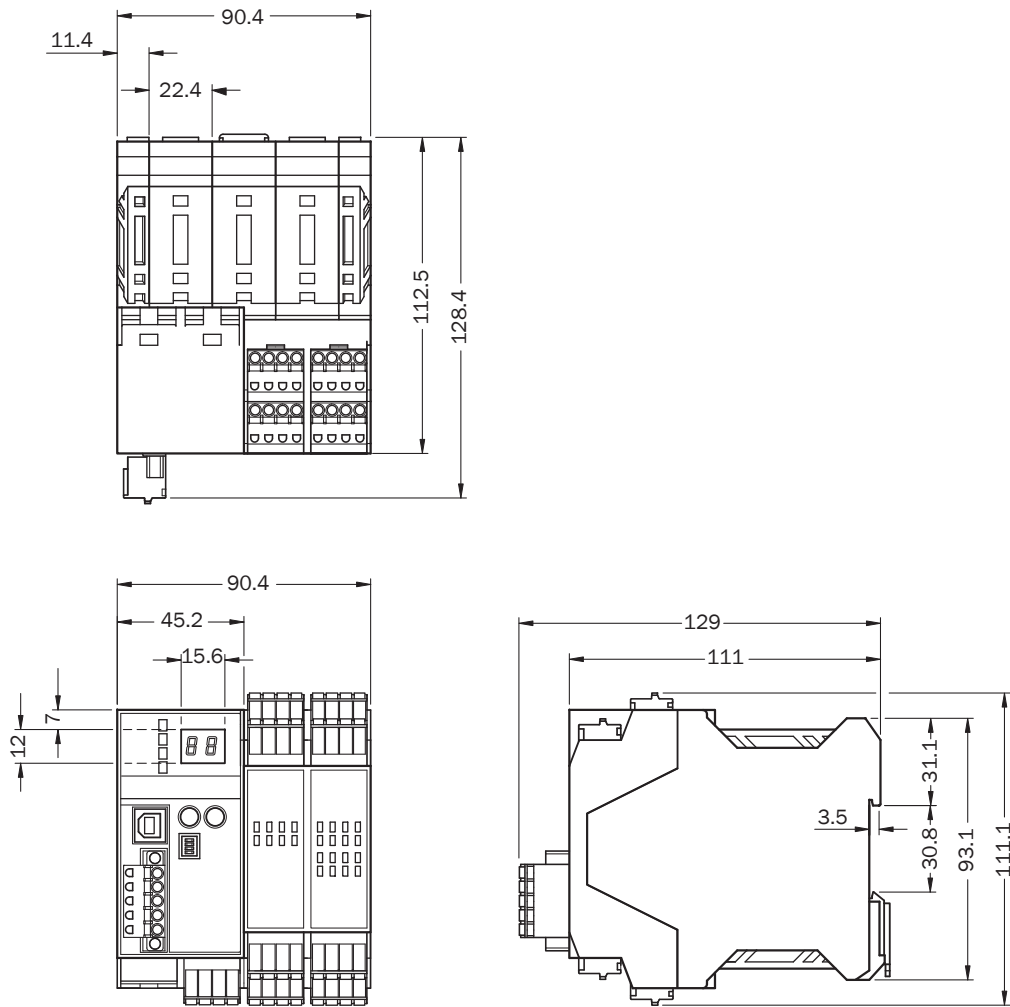
**Applications**

Safety command devices	✓
Electro-mechanical safety switches	✓
Non-contact safety switches	✓
Opto-electronic protective devices	✓
Two-hand control systems	✓
Operating mode selector switch	✓
Muting sensors	✓
Muting lamp	✓

**Functions**

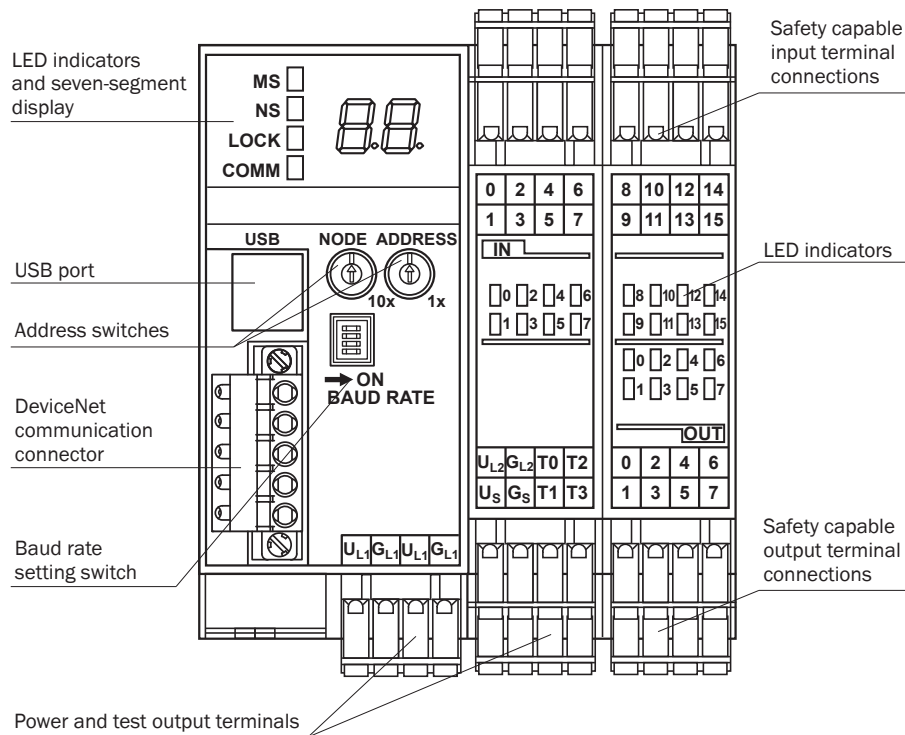
Functionality	Flexible safety controller
Safe device communication via EFI/SDL	-
External device monitoring	✓
Reset/restart	Manual, automatic/configurable
Logical functions	AND, OR, XOR, XNOR, NOT
On-delay	✓
Off-delay	✓
Door monitoring	✓
Signal routing	✓

## Dimensional drawings

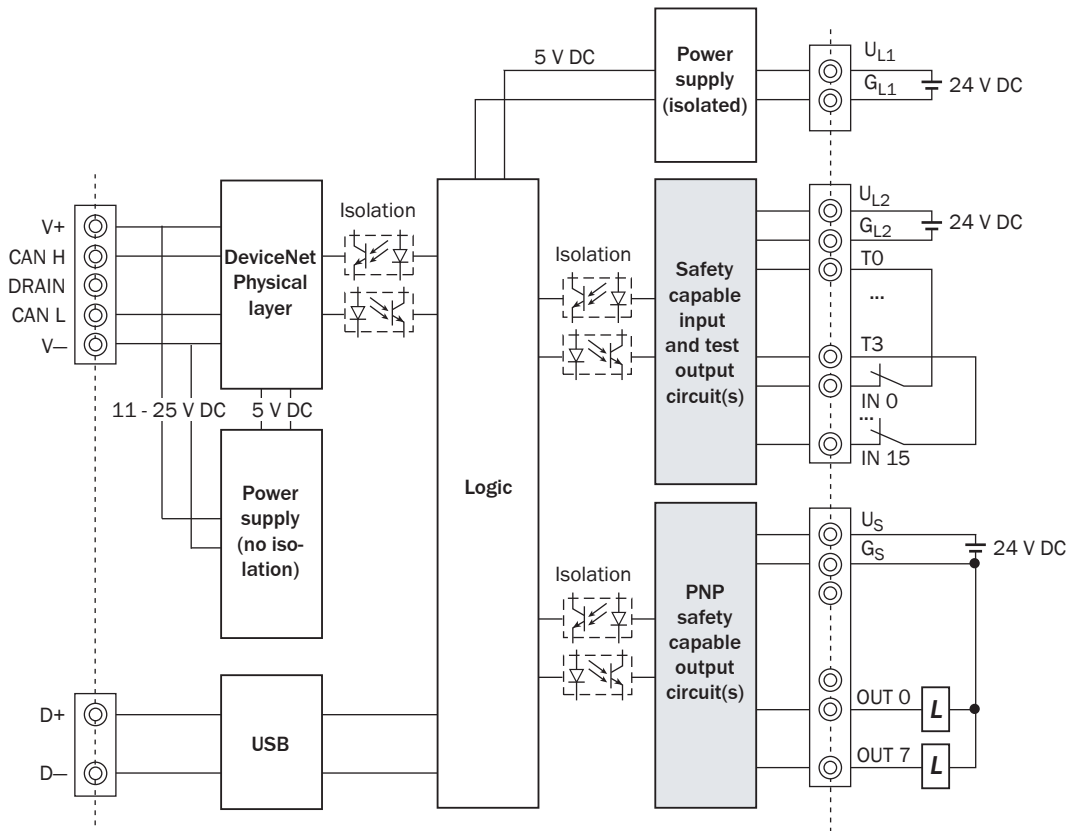


Dimensions in mm

## Device overview and connections



## Internal circuitry




Terminal name	Description
U <sub>L1</sub>	24 V DC power supply terminal for internal device power (e.g., internal logic). Both U <sub>L1</sub> terminals are internally connected.
G <sub>L1</sub>	0 V DC power supply terminal for internal device power (e.g., internal logic). Both G <sub>L1</sub> terminals are internally connected.
U <sub>L2</sub>	24 V DC power supply terminal for external input device and test output
G <sub>L2</sub>	0 V DC power supply terminal for external input device and test output
U <sub>S</sub>	24 V DC power supply terminal for external output device
G <sub>S</sub>	0 V DC power supply terminal for external output device
IN 0 through IN 15	Safety capable input terminals
T0 through T3	Test/signal output terminals
OUT 0 through OUT 7	Safety capable output terminals





## Accessories


### Terminal connectors

Figure	Connection type	Packing unit	Items supplied	Part no.
	Spring terminal plug, 4-pole	9	Key inserts and instructions	6030815


### DeviceNet Safety connection, terminal connectors

Figure	Connection type	Direction of cable outlet	Items supplied	Part no.
	Terminal plug with M12 x 5 connector	-	-	6030818
	Spring terminal plug, 5-pole	Single entry	With screw flange	6030817
	Spring terminal plug, 5-pole	Double entry	With screw flange	6030816



### DeviceNet Safety connection, configuration connection cables

Figure	Connection type	Cable length	Type	Part no.
	USB A to USB B	1.8 m	USB connection cable	6030820
		4.6 m	USB connection cable	6030819

### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790

### Configuration software

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314
	Enables the configuration and diagnostics of the DeviceNet and DeviceNet Safety network. Includes SICK CDS plug-in module for SICK UE4421 and configuration software plug-in for SICK UE4470 Safety Network Controller	SICK DeviceNet Safety Configurator	2032920

→ For more accessories, see UE4457, beginning on page P-38



- Easy upgrade of sensors and actuators on DeviceNet Safety™
- Multiple safety sensors and actuators are supported
- Decentralized evaluation of safety sensors and actuators
- Easy installation using clamp-style pluggable connectors
- IP 20 enclosure rating for DIN rail, panel mounting
- Uses only one safety fieldbus address for up to 16 sensors and actuators



## Technical data overview

Fieldbus	DeviceNet Safety
Number of safety inputs (depending on type)	6 dual-channel or 12 single-channel / 4 dual-channel or 8 single-channel / 2 dual-channel or 4 single-channel
Number of outputs (depending on type)	4 dual-channel or 8 single-channel / 2 dual-channel or 4 single-channel
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)

## Product description

SICK's IP 20-rated UE4421 remote I/O bus modules integrate safety sensors and actuators using DeviceNet Safety™. The UE4421 series of remote I/O bus modules are configured using an EDS file via the DeviceNet Safety™ network.

Versions include semiconductor safety inputs only, a combination of semiconductor safety inputs and safety outputs, and semiconductor inputs with relay-based safety outputs.

## Applications



## Ordering information

- Number of test/signal outputs (with current monitoring): 4 (1)

Functionality	Number of safety inputs	Number of outputs	Type	Part no.
Remote input device	6 dual-channel or 12 single-channel	-	UE4421-22EE900	1028309
Remote I/O device	2 dual-channel or 4 single-channel	2 dual-channel or 4 single-channel	UE4421-22EE330	1028310
	4 dual-channel or 8 single-channel	4 dual-channel or 8 single-channel	UE4421-22EE490	1028311

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P

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Type	UE4421-22EE900	UE4421-22EE330	UE4421-22EE490
Fieldbus	DeviceNet Safety		
Safety related parameters			
Safety integrity level	SIL3 (IEC 61508)		
Category	Category 4 (EN ISO 13849)		
Performance level	PL e (EN ISO 13849)		
PFHd (mean probability of a dangerous failure per hour)	2.0 x 10 <sup>-10</sup> (EN ISO 13849)	4.6 x 10 <sup>-9</sup> (EN ISO 13849)	2.0 x 10 <sup>-10</sup> (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)		
Supply voltage V <sub>S</sub>	20.4 V DC ... 26.4 V DC		
Connection type supply voltage	Spring terminal plug		
Ambient operating temperature from ... to	-10 °C ... +55 °C		
Enclosure rating	IP 20		
Protection class	III (EN 61140)	II (EN 61140)	III (EN 61140)
Vibration resistance	0.35 mm, 10 Hz ... 57 Hz, 50 m/sec <sup>2</sup> , 57 Hz ... 150 Hz (IEC 60068-2-6)		
Shock resistance	150 m/sec <sup>2</sup> , 11 ms (IEC 60068-2-27)	100 m/sec <sup>2</sup> , 11 ms (IEC 60068-2-27)	150 m/sec <sup>2</sup> , 11 ms (IEC 60068-2-27)
Assembly	35 mm top-hat rail according to IEC 60715		
Weight	420 g	460 g	420 g

### Field signal connections

Type	UE4421-22EE900	UE4421-22EE330	UE4421-22EE490
Connection type	Spring terminal plug		
Number of safety inputs	6 dual-channel or 12 single-channel	2 dual-channel or 4 single-channel	4 dual-channel or 8 single-channel
Type of output on the field signal input	PNP or contact		
Input voltage HIGH	11 V DC ... 26.4 V DC		
Input voltage LOW	0 V DC ... 5 V DC		
Input current HIGH	6 mA		
Input delay	Configurable, 0 ms ... 126 ms		
Safety outputs			
Number of outputs	-	2 dual-channel or 4 single-channel	4 dual-channel or 8 single-channel
Type of output	-	Relay	Current sourcing (PNP)
Switching current	-	Max. 2 A	Max. 500 mA
Leakage current	-	-	0.1 mA
Mechanical life (relay contacts)	-	5 x 10 <sup>6</sup> switching cycles	-
Electrical life (relay contacts)	-	1 x 10 <sup>5</sup> switching cycles	-
Test/signal outputs			
Number of test/signal outputs (with current monitoring)	4 (1)		
Output current per channel	700 mA		
Leakage current	Max. 0.1 mA		

### DeviceNet Safety network connections

Type	UE4421-22EE900	UE4421-22EE330	UE4421-22EE490
Number of safety target connections		Max. 4	
Expected packet interval (EPI) setting		6 ms ... 1 ms	
Single cast I/O support		5 Bytes/5 Bytes	
Multi cast I/O support		5 Bytes/5 Bytes	

### DeviceNet network connections

Type	UE4421-22EE900	UE4421-22EE330	UE4421-22EE490
Poll connection maximum I/O transmission rate		5 Bytes/5 Bytes	
Number of standard slave connections		Max. 2	
Number of UCMM server		Max. 2	
Connection type		Spring terminal plug	
DeviceNet communication rate		125 kbit/s, 250 kbit/s, 500 kbit/s, Autobaud detection	
DeviceNet communication rate setting method		Automatic (Autobaud only)	
DeviceNet addressing		Via the safety network configuration tool (e.g., SICK DeviceNet Safety Configurator)	

### Applications

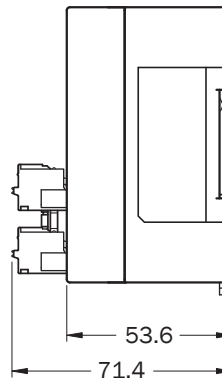
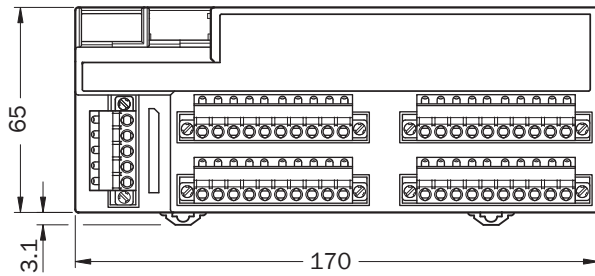
Type	UE4421-22EE900	UE4421-22EE330	UE4421-22EE490
Safety command devices		✓	
Electro-mechanical safety switches		✓	
Non-contact safety switches		✓	
Opto-electronic protective devices		✓	
Two-hand control systems		✓	
Operating mode selector switch		✓	
Muting sensors		✓	
Muting lamp		✓	

### Functions

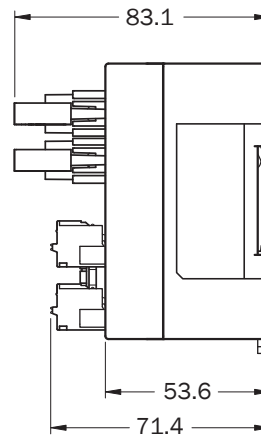
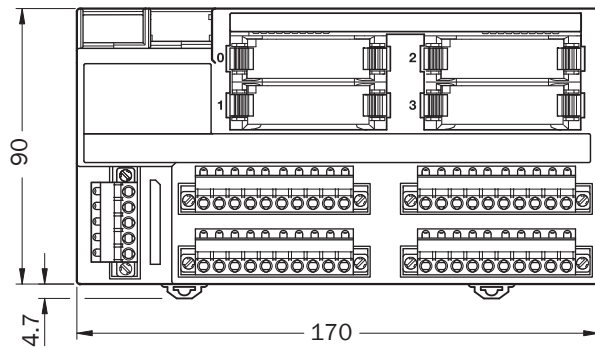
Type	UE4421-22EE900	UE4421-22EE330	UE4421-22EE490
Functionality	Remote input device	Remote I/O device	

## Dimensional drawings

**UE4421-22EE900, UE4421-22EE490**



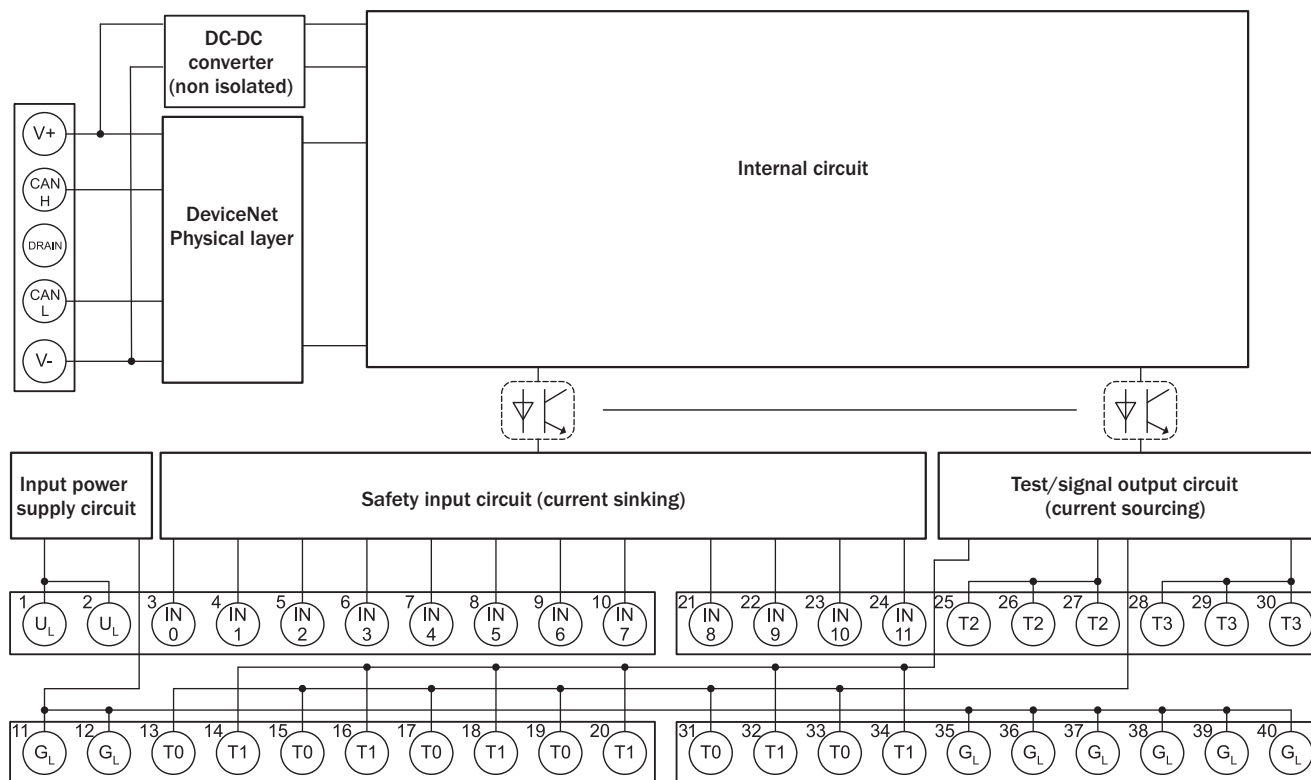
**UE4421-22EE330**



Dimensions in mm

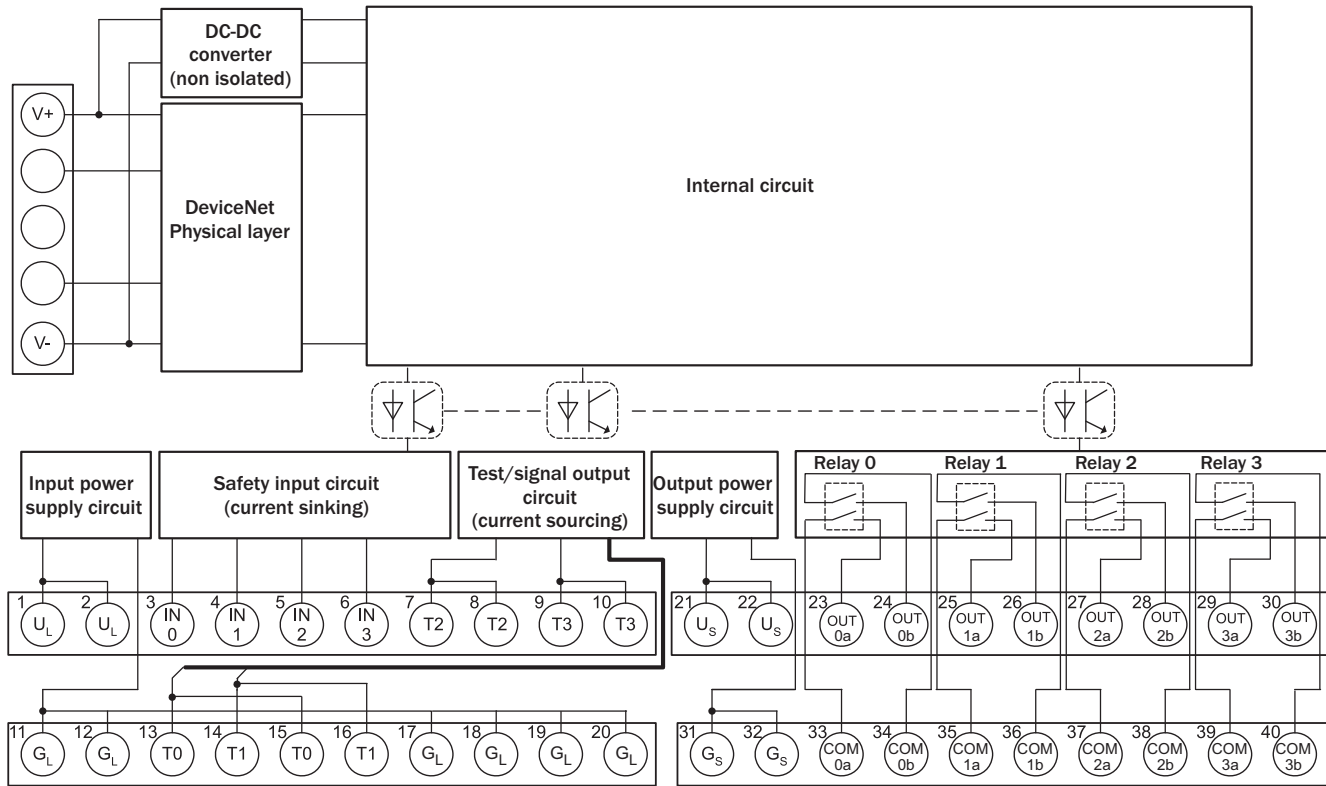
## Internal circuitry

### UE4421-22EE900



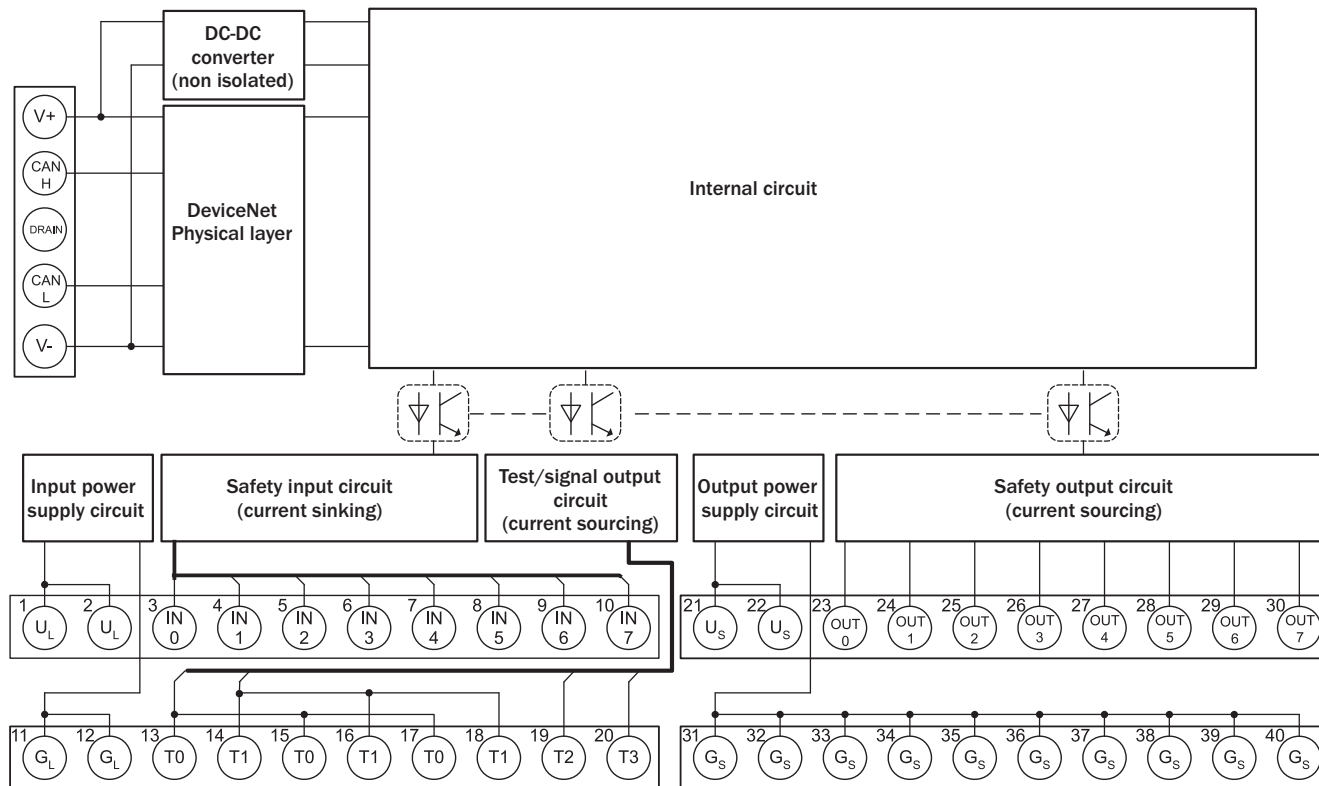
Terminal number(s)	Naming convention	Functionality
1, 2	U <sub>L</sub>	<ul style="list-style-type: none"> <li>Power terminals for safety capable input devices and test/signal outputs</li> <li>The terminals must be wired to 24 V DC.</li> </ul>
11, 12, 35 - 40	G <sub>L</sub>	<ul style="list-style-type: none"> <li>Power terminals for safety capable inputs and test/signal outputs</li> <li>The terminals must be wired to common (0 V DC).</li> <li>All G<sub>L</sub> terminals are internally connected.</li> </ul>
3 - 10, 21 - 24	IN0 to IN11	<ul style="list-style-type: none"> <li>Terminals for safety capable input devices</li> </ul>
13 - 20, 25 - 30, 31 - 34	T0 to T3	<ul style="list-style-type: none"> <li>Terminals for test/signal outputs</li> </ul>

UE4421-22EE330



Terminal number(s)	Naming convention	Functionality
1, 2	U <sub>L</sub>	<ul style="list-style-type: none"> <li>Power terminals for input devices</li> <li>The terminals must be wired to 24 V DC.</li> </ul>
11, 12, 17 - 20	G <sub>L</sub>	<ul style="list-style-type: none"> <li>Power terminals for safety capable inputs and test/signal outputs</li> <li>These terminals should be connected to 0 V DC common for U<sub>L</sub>.</li> <li>All G<sub>L</sub> terminals are internally connected.</li> </ul>
3 - 6	IN0 to IN7	<ul style="list-style-type: none"> <li>Terminals for safety capable input devices</li> </ul>
7 - 10, 13 - 16	T0 to T3	<ul style="list-style-type: none"> <li>Terminals for test/signal</li> </ul>
21, 22	U <sub>S</sub>	<ul style="list-style-type: none"> <li>Power terminals for output devices</li> <li>The terminals must be wired to 24 V DC.</li> </ul>
31, 32	G <sub>S</sub>	<ul style="list-style-type: none"> <li>Power terminals for output devices</li> <li>These terminals must be wired to 0 V DC common.</li> <li>All G<sub>S</sub> terminals are internally connected.</li> </ul>
23 - 30	OUT 0a/0b to OUT 3a/3b	<ul style="list-style-type: none"> <li>Terminals for safety capable output devices</li> <li>OUT xa/xb are the same output.</li> </ul>
33 - 40	COM 0a/0b to COM 3a/3b	<ul style="list-style-type: none"> <li>Terminals for safety capable output devices</li> <li>COM xa/xb are the same output.</li> </ul>

UE4421-22EE490



Terminal numbers	Naming convention	Functionality
1, 2	U <sub>L</sub>	<ul style="list-style-type: none"> <li>Power terminals for safety capable input devices and test/signal outputs</li> <li>The terminals must be wired to 24 V DC.</li> </ul>
11, 12	G <sub>L</sub>	<ul style="list-style-type: none"> <li>Power terminals for safety capable inputs and test/signal outputs</li> <li>The terminals must be wired to common (0 V DC).</li> <li>All G<sub>L</sub> terminals are internally connected.</li> </ul>
3 - 10	IN0 to IN7	<ul style="list-style-type: none"> <li>Terminals for safety capable input devices</li> </ul>
13 - 20	T0 to T3	<ul style="list-style-type: none"> <li>Terminals for test/signal</li> </ul>
21, 22	U <sub>S</sub>	<ul style="list-style-type: none"> <li>Power terminals for output devices</li> <li>The terminals must be wired to 24 V DC.</li> </ul>
31 - 40	G <sub>S</sub>	<ul style="list-style-type: none"> <li>Power terminals for safety capable outputs</li> <li>These terminals should be connected to 0 V DC common for U<sub>S</sub>.</li> <li>All G<sub>S</sub> terminals are internally connected.</li> </ul>
23 - 30	OUT0 to OUT7	<ul style="list-style-type: none"> <li>Terminals for safety capable output devices</li> </ul>

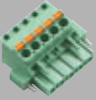



## Connection diagrams


→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

## Accessories

### DeviceNet Safety connection, terminal connectors

Figure	Connection type	Direction of cable outlet	Items supplied	Part no.
	Spring terminal plug, 5-pole	Single entry	With screw flange	6030817
	Terminal plug with M12 x 5 connector	-	-	6030818
	Spring terminal plug, 5-pole	Double entry	With screw flange	6030816

### Power supply units

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	3.9 A	7028790
			2.1 A	7028789

→ For more accessories, see UE4457, beginning on page P-38



- No control cabinet needed
- Decentralized evaluation of safety sensors and actuators
- Safety Data Link (SDL) to SICK safety components
- Functions as controller or as remote I/O
- Fixed system reaction time
- Easy upgrade using already installed sensors and actuators



## Technical data overview

Fieldbus	DeviceNet Safety
Number of safety inputs	6 dual-channel or 12 single-channel
Number of SDL connections	2
Number of outputs	2 dual-channel
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)

## Product description

The UE4457 safety remote controller by SICK integrates and evaluates any combination of safety sensors and actuators. This can either be achieved in stand-alone mode or in networked applications. The UE4457 can function as a safety controller and/or remote I/O device. It allows easy configuration and diagnostics of sensors with SICK safety communication. The Safety Enable functionality allows standard masters (e.g., PLC) to control the safety outputs of the UE4457 directly, eliminating the need for any additional safety PLC. The Fast Shut-Off functionality enables a fast and constant reaction time of 8 ms through direct routing of local safety inputs to the safety outputs of the UE4457.

- Compact IP 67-rated safety controller in technology
- Wide selection of certified function blocks
- Optimized system reaction times in stand-alone or networked operation
- Standard and safety PLC may control safety outputs with safety having priority
- 6 dual-channel or 12 single-channel safety inputs with 12 test outputs
- Easy integration and diagnostics of SICK's intelligent safety sensors via SICK Safety Data Link (SDL)
- 2 dual-channel (2A) bipolar safety outputs

## Applications



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→ Connection diagrams	P-37
→ Accessories	P-38
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P

## Ordering information

Functionality	Number of safety inputs	Number of SDL connections	Safe device communication via EFL/SDL	Number of outputs	Number of test/signal outputs (with current monitoring)	Type	Part no.
Safety remote controller	6 dual-channel or 12 single-channel	2	✓	2 dual-channel	12	UE4457-03DC9F0	1028307

## Technical specifications

→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

### General system data

Fieldbus	DeviceNet Safety
Safety related parameters	
Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849)
Performance level	PL e (EN ISO 13849)
PFHd (mean probability of a dangerous failure per hour)	$5.4 \times 10^{-10}$ (EN ISO 13849)
T <sub>M</sub> (Mission Time)	20 years (EN ISO 13849)
Supply voltage V <sub>S</sub>	19.2 V DC ... 28.8 V DC
Connection type supply voltage	Mini 7/8" × 4
Ambient operating temperature from ... to	-10 °C ... +55 °C
Enclosure rating	IP 67
Protection class	III (EN 61140)
Vibration resistance	0.35 mm, 10 Hz ... 57 Hz (IEC 60068-2-6)
Shock resistance	15 g, 11 ms (IEC 60068-2-27)
Assembly	Field mounting in the system
Weight	650 g

### Field signal connections

Connection type	5-pole M12 Connector
Number of safety inputs	6 dual-channel or 12 single-channel
Type of output on the field signal input	PNP or contact
Input voltage HIGH	11 V DC ... 30 V DC
Input voltage LOW	-30 V DC ... 5 V DC
Input current HIGH	3 mA ... 7 mA
Input delay	Configurable, 0 ms ... 635 ms
Number of SDL connections	2
Safety outputs	
Number of outputs	2 dual-channel
Type of output	Bipolar type
Switching current	Max. 2 A
Leakage current	0.5 mA
Test/signal outputs	
Number of test/signal outputs (with current monitoring)	12
Output current per channel	700 mA
Leakage current	Max. 0.5 mA

### DeviceNet Safety network connections

Number of safety target connections	Max. 6
Expected packet interval (EPI) setting	10 ms ... 5 ms
Single cast I/O support	16 Bytes/16 Bytes
Multi cast I/O support	16 Bytes/16 Bytes

### DeviceNet network connections

Poll connection maximum I/O transmission rate	16 Bytes/16 Bytes
Number of standard slave connections	Max. 3
Number of UCMM server	Max. 4
Connection type	Mini 7/8" × 5
DeviceNet communication rate	125 kbit/s, 250 kbit/s, 500 kbit/s, Autobaud detection
DeviceNet communication rate setting method	Software
DeviceNet addressing	Via the safety network configuration tool (e.g., SICK DeviceNet Safety Configurator)

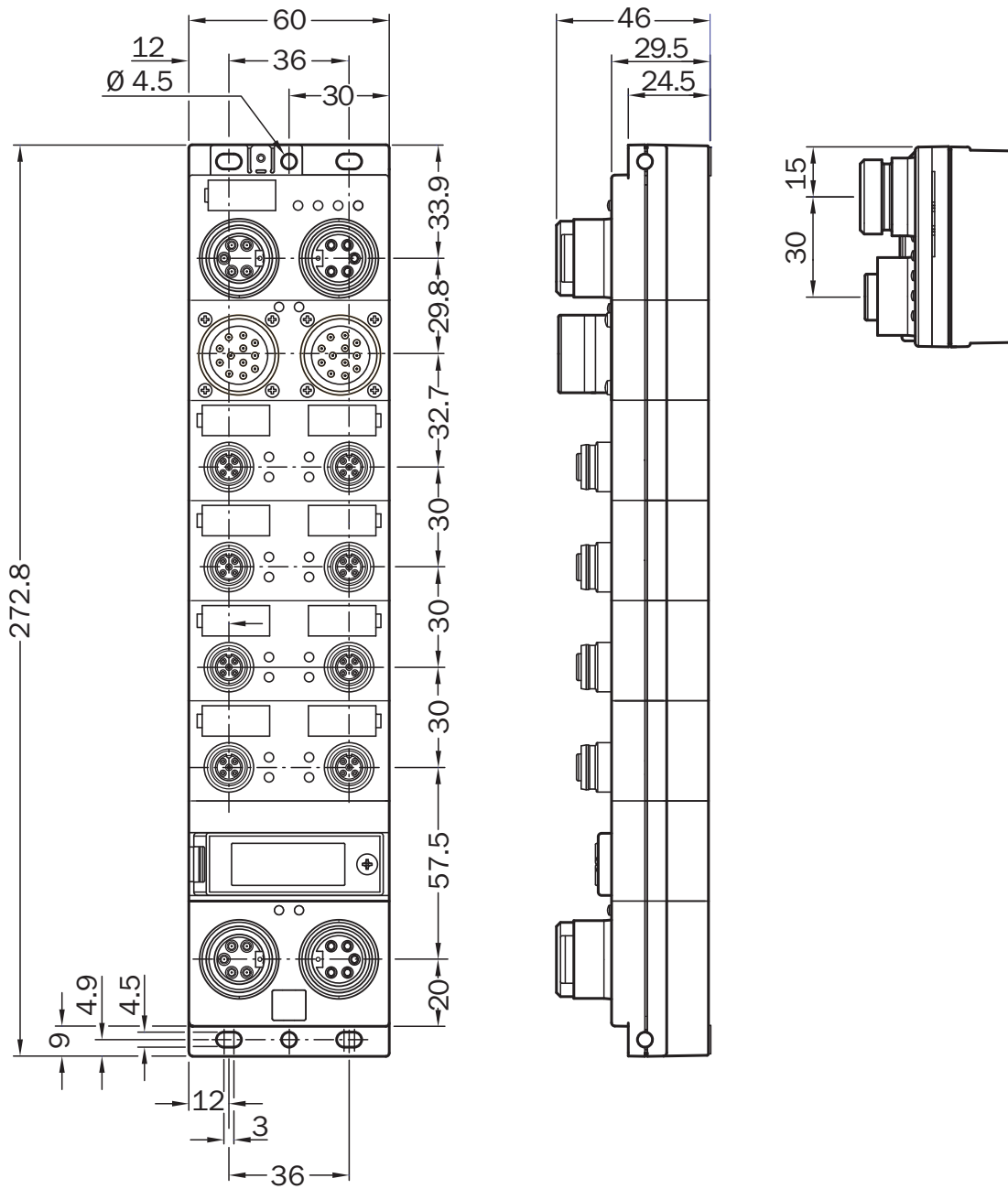
### Applications

Safety command devices	✓
Electro-mechanical safety switches	✓
Non-contact safety switches	✓
Opto-electronic protective devices	✓
Two-hand control systems	✓
Operating mode selector switch	✓
Muting sensors	✓
Muting lamp	✓

### Functions

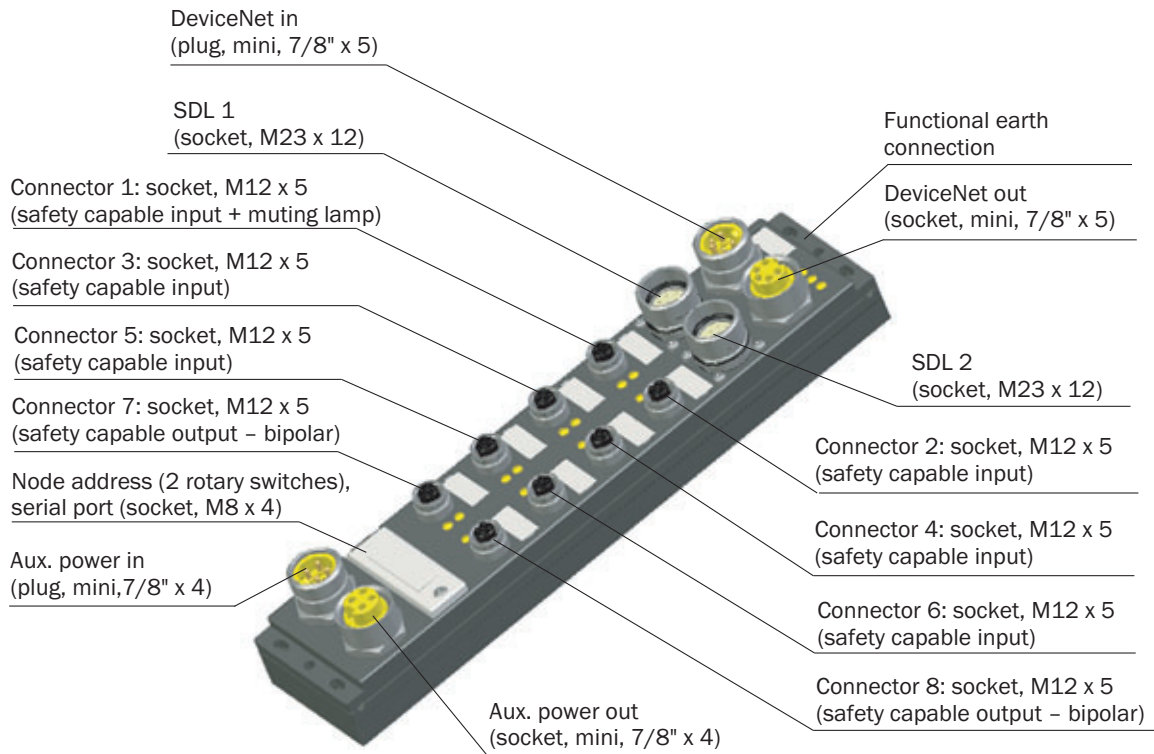
Functionality	Safety remote controller
Safe device communication via EFI/SDL	✓
External device monitoring	✓
Reset/restart	Manual, automatic/configurable
Logical functions	AND, OR, XOR, XNOR, NOT
On-delay	✓
Off-delay	✓
Door monitoring	✓
Signal routing	✓
Bidirectional communication	✓

## Dimensional drawings



Dimensions in mm

## Device overview and connections

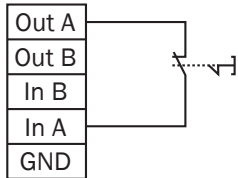


## Connection diagrams

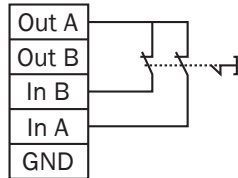
→ You can find more connection diagrams at [www.mysick.com](http://www.mysick.com)

### Emergency stop, safety door on the field-signal connection

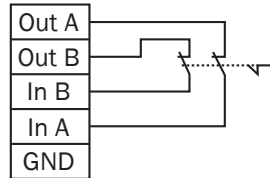
Single-channel



Dual-channel with common testing



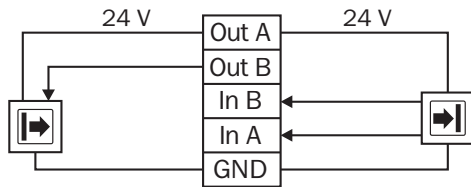
Dual-channel with isolated testing



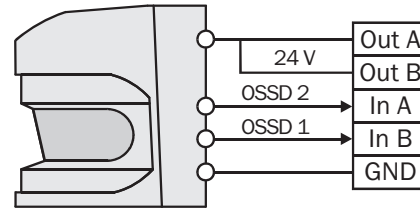
Depending on the required performance level, the emergency stop can be realized using a single-channel, dual-channel with common testing or dual-channel with isolated testing.

The performance level classification of components with contacts (e.g., safety door switches and emergency stops) into a performance level depends both on the connection type (single-channel/dual-channel) and on the configuration (single/redundant, testing type). Therefore, the appropriate switching component for the required performance level and switching type must always be selected.

### Electro-sensitive protective equipment (ESPE) on the field-signal connection



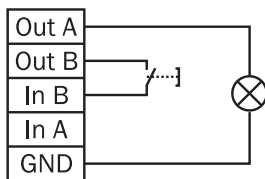
When electro-sensitive protective equipment (ESPE) is connected, sender and receiver can be used with a system's input and output. Care must be taken to ensure the current consumption of the ESPE is within the rated limits of the output.



You can use output Out B to test the sender.

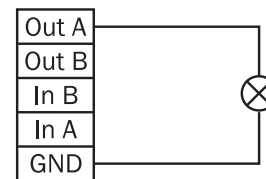
The switching outputs of the receiver are present on inputs In A and In B.

### Control switch with indicator display on the field-signal connection



The indicator display (Out A) is being controlled by the UE4457, a safety PLC, or a standard PLC.


### Muting lamp on the field-signal connection



When fault monitoring of the muting lamp is required, the muting lamp must be connected to channel A of either output 7 or 8, as only these outputs are capable of monitoring lamp failures.

## Accessories


### Field-signal connection, connecting cables

Figure	Connection type	Direction of cable outlet	Cable material	Shielded	Cable length	Part no.
	Plug M12 x 5, stripped	Straight	PUR halogen free	-	2 m	6026133
					5 m	6026134
					10 m	6026135
			-	✓	2 m	6024860
					5 m	6024861
					10 m	6024862


### Field-signal connection, connecting cables, for the connection of C4000 Standard/Advanced

Connection type	Direction of cable outlet	Description	Shielded	Cable length	Part no.
Plug M12 x 5, Hirschmann cable socket M26 x 11 + FE	Plug straight/ socket straight	For the connection of C4000 Standard/Advanced receiver unit	✓	10 m	2040016
		For the connection of C4000 Standard/Advanced sender unit			2040019

### Field-signal connection, connectors

Figure	Connection type	Direction of cable outlet	Connection conductor cross-section	Cable diameter	Shielded	Type	Part no.
	Plug M12 x 5, screwed	Straight	0.75 mm <sup>2</sup>	-	✓	Plug	6024741
			-	Ø 4 mm	-	STE-1205-G	6022083
		Angled	-	Ø 4 mm	-	STE-1205-W	6022082

### Field-signal connection, T-junctions


Figure	Connection type	Usage	Type	Part no.
	Plug M12 x 5	For the connection of sender/receiver to an opto-electronic protective device	T-connector	6026517
		For the simultaneous connection of, e.g., two emergency stop buttons (single-channel) on one field-signal connection	Two-way splitter	6024744

### Field-signal connection, protective cap


Packing unit	Type	Part no.
10	Protective cap	2019706



**SDL connection, SDL connection cables, for the connection of safety bus modules to C4000**

Figure	Connection type	Direction of cable outlet	Connection conductor cross-section	Cable length	Part no.
	Hirschmann cable socket M26 x 11 + FE, Interconnectron plug M23 x 11 + FE	Plug straight/ socket straight	0.75 mm <sup>2</sup>	2.5 m	2029131
				5 m	2025634
				10 m	2025635
				15 m	2025636
	Interconnectron cable socket M23 x 11 + FE, Interconnectron plug M23 x 11 + FE	Plug straight/ socket straight	-	0.5 m	7029160
				3 m	7029161
				7.5 m	7029162
				15 m	7029163
				20 m	7029164


**SDL connection, SDL connection cables, for the connection of safety bus modules to S3000**

Figure	Connection type	Direction of cable outlet	Connection conductor cross-section	Shielded	Cable length	Part no.
	Interconnectron plug M23 x 12, stripped	Straight	0.75 mm <sup>2</sup>	✓	2.5 m	2029337
					5 m	2029338
					10 m	2029339
					15 m	2029340


**SDL connection, connector**

Figure	Connection type	Type	Part no.
	Interconnectron plug M23 x 12, crimped	Interconnectron plug	6024742




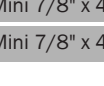
**SDL connection, protective cap**

Figure	Type	Part no.
	Protective cap	5310774

**DeviceNet Safety connection, connecting cables**

Figure	Connection type	Cable material	Cable diameter	Cable length	Type	Part no.
	Mini 7/8" x 5, male and female	PVC	Ø 6.9 mm	By the meter	Connection cable	6030921
			Ø 12.2 mm		Connection cable	6030756
			Ø 6.9 mm	1 m	DeviceNet cable	6030743
			Ø 12.2 mm	2 m	DeviceNet cable	6030749
			Ø 6.9 mm		DeviceNet cable	6030744
			Ø 6.9 mm	3 m	DeviceNet cable	6030745
			Ø 6.9 mm	4 m	DeviceNet cable	6030746
			Ø 6.9 mm	5 m	DeviceNet cable	6030747
			Ø 6.9 mm	6 m	DeviceNet cable	6030748



**DeviceNet Safety connection, DeviceNet connectors**

Figure	Connection type	Direction of cable outlet	Usage	Type	Part no.
	Mini 7/8" x 5, female	-	Panel mount	DeviceNet connection	6030807
		Straight	-	DOS-7805-GKEND	6028329
	Mini 7/8" x 5, female, can be preformed	Straight	-	DOS-7805-GK	6028331
	Mini 7/8" x 5, male	-	Panel mount	DeviceNet connection	6030808
	Mini 7/8" x 5, male	-	-	DeviceNet terminator	6028995
	Mini 7/8" x 5, male, can be preformed	Straight	-	STE-7805-GK	6028332
	Mini 7/8" x 5, one male and two female	-	-	T-connector	6030752


**DeviceNet Safety connection, protective caps**

Connection type	Part no.
Mini 7/8" x 4 or 7/8" x 5, female	5315187
Mini 7/8" x 4 or 7/8" x 5, male	5315188


**Auxiliary power supply, connecting cables**

Figure	Connection type	Direction of cable outlet	Description	Connection conductor cross-section	Cable length	Part no.
	-	-	-	-	by the meter	6030757
	Mini 7/8" x 4, female, stripped	-	-	-	2 m	6030753
			-	-	5 m	6030754
			-	-	10 m	6030755
			-	-	10 m	6030755
	Mini 7/8" x 4, female, flying leads	Straight	With screw lock	1.5 mm <sup>2</sup>	0.3 m	6030805
	Mini 7/8" x 4, male, flying leads				0.3 m	6030806


**Auxiliary power supply, connector**

Figure	Connection type	Direction of cable outlet	Connection conductor cross-section	Part no.
	Mini 7/8" x 4, male	Straight	1.5 mm <sup>2</sup>	6030804


**Auxiliary power supply, cable receptacles**

Figure	Connection type	Direction of cable outlet	Connection conductor cross-section	Part no.
	Mini 7/8" x 4, female, screwed	Straight	1.5 mm <sup>2</sup>	6030803

**Configuration connection cables**

Figure	Connection type	Cable length	Items supplied	Type	Part no.
	Connector RS-232, USB	35 cm	Including driver and operating instructions	Converter RS-232 to USB	6035396


**Power supply units**

Figure	Input voltage	Output voltage	Maximum output current	Part no.
	100 V AC ... 240 V AC	24 V DC	2.1 A	7028789
			3.9 A	7028790


**Configuration software**

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314

**Cable cover**

Figure	Description	Connection type	Type	Part no.
	Used to minimize tampering. A cable sheath provides visible indication when the cable has been removed or changed.	M12	Cable sheath/cover	5315186

**Configuration connection, configuration connection cables**

Figure	Description	Connection type	Cable length	Type	Part no.
	Connects the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649



- 2 inputs (EFI interface) for the connection of intelligent SICK safety solutions
- Easy configuration and diagnostics with the aid of CDS (Configuration & Diagnostic Software)



## Technical data overview

Fieldbus/communication interface (depending on type)	PROFINET IO PROFI-safe, PROFIBUS PROFI-safe, PROFIBUS, CANopen®, Ethernet (TCP/IP)
Number of EFI interfaces	2
Enclosure rating	IP 20

## Product description

The family of EFI gateways is used to connect intelligent SICK safety devices to fieldbus and Ethernet networks.

Properties of EFI gateways:

- All SICK components connected to the EFI connection can be easily configured and diagnosed over the different fieldbus networks using CDS.

Properties of UE1840:

- An e-mail alert can be sent from information provided by the connected EFI devices. (e.g., contamination of the S3000)

Properties of UE1140, UE1940, UE4140 and UE4740:

- Configurable process image with information from the EFI sensors connected to the PLC and from the PLC to the sensors (input and output)
- Support of PROFIBUS-DP V1 (UE1140, UE4140)
- Support of PROFINET IO Conformance Class A, LLDP, SNMP, MIB II, cyclic I/O communication, acyclic read/write services for communication via TCI interface, diagnostics alarm, TCP/IP communication via Port 9000 (UE4740)
- Support of PROFI-safe V2.00 (UE4140, UE4740)
- Support of CANopen (UE1940)

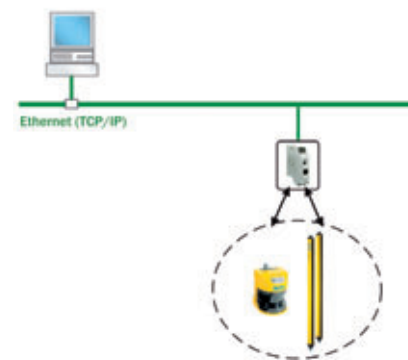
## Applications

- S3000/S300 safety laser scanners
- M4000 multiple light beam safety devices
- C4000 safety light curtains

### PROFIBUS EFI gateway UE1140



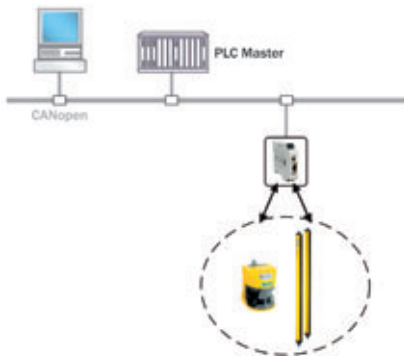
### Ethernet EFI gateway UE1840



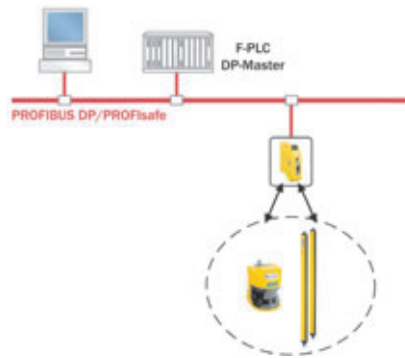
Further information	Page
→ Dimensional drawings	P-44
→ Device overview and connections	P-45
→ Accessories	P-47
→ Systematic safety	A-0
→ Services	B-0

P

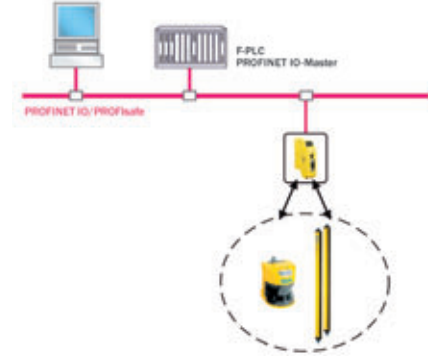
CANopen EFI gateway UE1940



PROFIBUS PROFIsafe EFI gateway UE4140



PROFINET IO PROFIsafe EFI gateway UE4740



## Ordering information

- Number of EFI interfaces: 2
- Additional sensor functions available when using EFI communications: ✓

Fieldbus/communication interface	Type	Part no.
PROFIBUS	UE1140-22I0000	1029099
Ethernet (TCP/IP)	UE1840-22H0000	1029100
CANopen®	UE1940-I220000	1040397
PROFIBUS PROFIsafe	UE4140-22I0000	1029098
PROFINET IO PROFIsafe	UE4740-20H0000	1046978

## Technical specifications

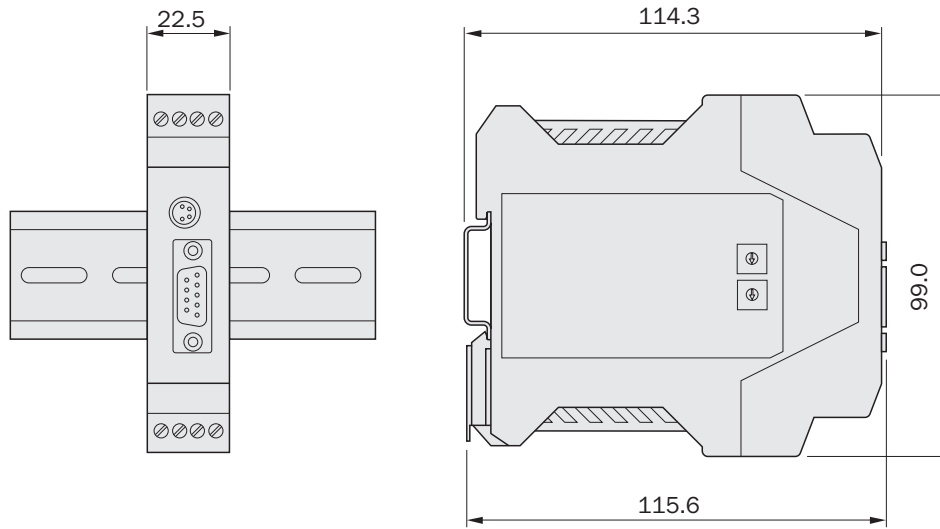
→ You can find more detailed data in the operating instructions. Download at [www.mysick.com](http://www.mysick.com)

Type	UE1140-22I0000	UE1840-22H0000	UE1940-I220000	UE4140-22I0000	UE4740-20H0000																
Fieldbus/communication interface	PROFIBUS	Ethernet (TCP/IP)	CANopen®	PROFIBUS PROFIsafe	PROFINET IO PROFIsafe																
Enclosure rating	IP 20 (IEC 60529)																				
Safety related parameters	<table border="0"> <tr> <td>Safety integrity level</td> <td>-</td> <td colspan="2">SIL3 (IEC 61508)</td> </tr> <tr> <td>Category</td> <td>-</td> <td colspan="2">Category 4 (EN ISO 13849)</td> </tr> <tr> <td>Performance level</td> <td>-</td> <td colspan="2">PL e (EN ISO 13849)</td> </tr> <tr> <td>PFHd (mean probability of a dangerous failure per hour)</td> <td>-</td> <td>3.3 x 10<sup>-10</sup> (EN ISO 13849)</td> <td>2.84 x 10<sup>-9</sup> (EN ISO 13849)</td> </tr> </table>					Safety integrity level	-	SIL3 (IEC 61508)		Category	-	Category 4 (EN ISO 13849)		Performance level	-	PL e (EN ISO 13849)		PFHd (mean probability of a dangerous failure per hour)	-	3.3 x 10 <sup>-10</sup> (EN ISO 13849)	2.84 x 10 <sup>-9</sup> (EN ISO 13849)
Safety integrity level	-	SIL3 (IEC 61508)																			
Category	-	Category 4 (EN ISO 13849)																			
Performance level	-	PL e (EN ISO 13849)																			
PFHd (mean probability of a dangerous failure per hour)	-	3.3 x 10 <sup>-10</sup> (EN ISO 13849)	2.84 x 10 <sup>-9</sup> (EN ISO 13849)																		
Supply voltage V <sub>S</sub>	24 V DC (19.2 V DC ... 28.8 V DC)				24 V DC (16.8 V DC ... 30 V DC)																
Maximum power consumption	4 W				5 W																
Connection type	Plug-in terminals, screwed																				
Baud rate	0.0096 Mbit/s ... 12 Mbit/s	10 Mbit/s ... 100 Mbit/s	0.01 Mbit/s ... 1 Mbit/s	0.0096 Mbit/s ... 12 Mbit/s	10 Mbit/s ... 100 Mbit/s																
Address range	3 ... 126	-	1 ... 127	3 ... 126	-																
Ident number	0995 hex	-	-	0994 hex	-																
CANopen profile	-	-	DS 301, DS 401	-	-																

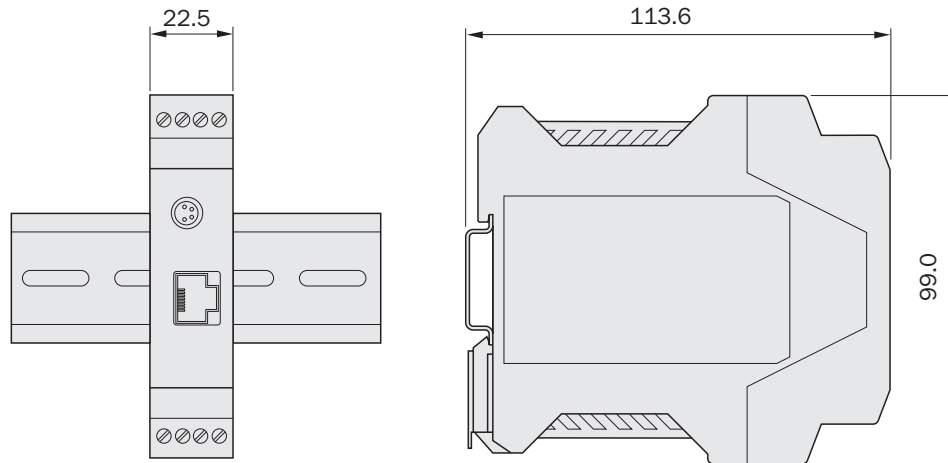


## Dimensional drawings

**PROFIBUS EFI gateway UE1140, CANopen EFI gateway UE1940  
PROFIBUS PROFI-safe EFI gateway UE4140**

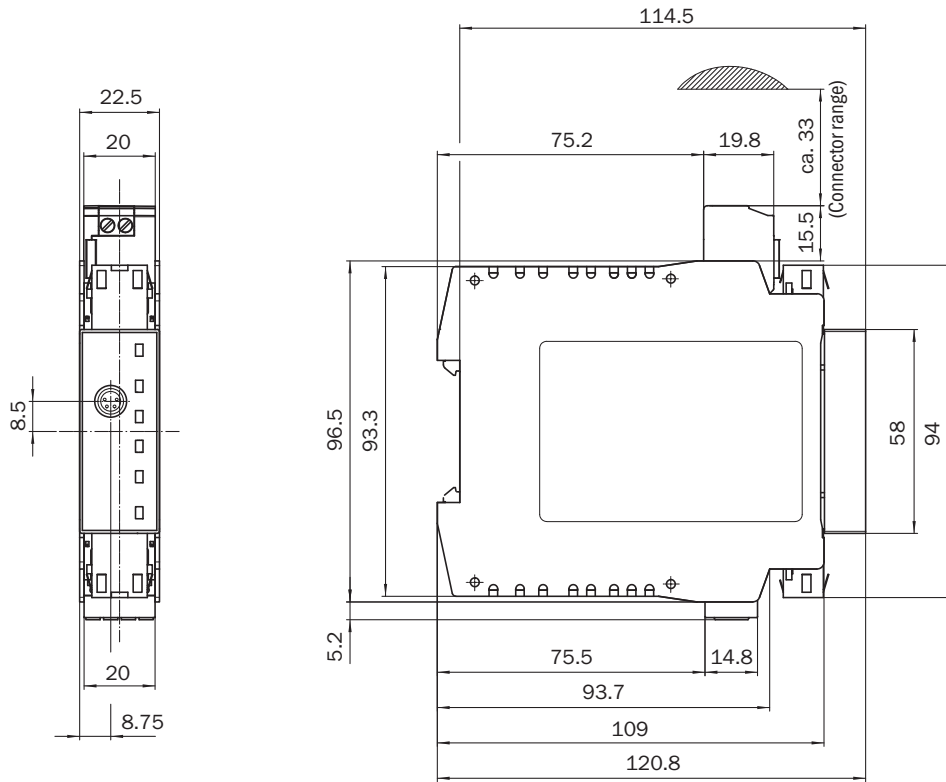


**Ethernet EFI gateway UE1840**



Dimensions in mm

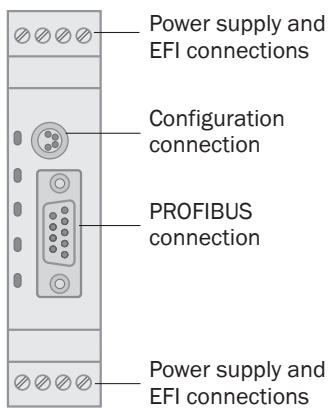
**PROFINET IO PROFIsafe EFI gateway UE4740**



Dimensions in mm

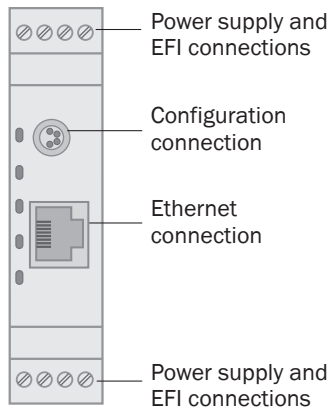
**Device overview and connections**

**PROFIBUS EFI gateway UE1140**



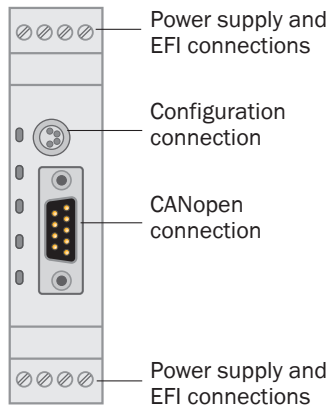
- Supply and EFI connections
  - Terminal 1 + 8: Voltage supply EFI gateway
  - Terminal 2 + 7: Functional earth for screened EFI cable
  - Terminal 3 + 4: Connection 2 for intelligent SICK EFI safety devices
  - Terminal 5 + 6: Connection 1 for intelligent SICK EFI safety devices
- Configuration connection:
  - To directly connect a PC and configure the system using the SICK CDS
- PROFIBUS connection (9-pin D-SUB):
  - For connection to PROFIBUS master or other PROFIBUS slaves

Ethernet EFI gateway UE1840



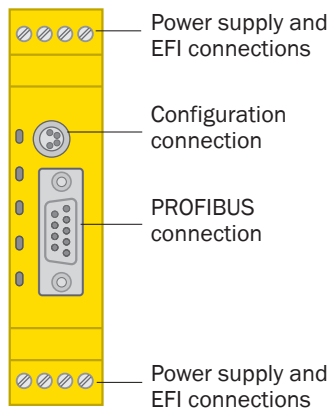
- Supply and EFI connections
  - Terminal 1 + 8: Voltage supply EFI gateway
  - Terminal 2 + 7: Functional earth for screened EFI cable
  - Terminal 3 + 4: Connection 2 for intelligent SICK EFI safety devices
  - Terminal 5 + 6: Connection 1 for intelligent SICK EFI safety devices
- Configuration connection:  
 To directly connect a PC and configure the system using the SICK CDS
- Ethernet connection (RJ-45):  
 For connection to Ethernet network for configuration and diagnostics

CANopen EFI gateway UE1940



- Supply and EFI connections
  - Terminal 1 + 8: Voltage supply EFI gateway
  - Terminal 2 + 7: Functional earth for screened EFI cable
  - Terminal 3 + 4: Connection 2 for intelligent SICK EFI safety devices
  - Terminal 5 + 6: Connection 1 for intelligent SICK EFI safety devices
- Configuration connection:  
 To directly connect a PC and configure the system using the SICK CDS
- CANopen connection (9-pin D-SUB):  
 For connection to CANopen networks

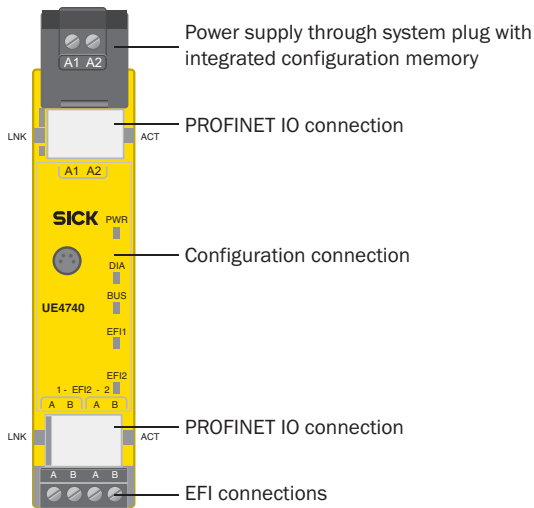
PROFIBUS PROFIsafe EFI gateway UE4140



- Supply and EFI connections
  - Terminal 1 + 8: Voltage supply EFI gateway
  - Terminal 2 + 7: Functional earth for screened EFI cable
  - Terminal 3 + 4: Connection 2 for intelligent SICK EFI safety devices
  - Terminal 5 + 6: Connection 1 for intelligent SICK EFI safety devices
- Configuration connection:  
 To directly connect a PC and configure the system using the SICK CDS
- PROFIBUS connection (9-pin D-SUB):  
 For connection to PROFIBUS master or other PROFIBUS slaves



## PROFINET IO PROFIsafe EFI gateway UE4740



- Supply and EFI connections
  - Configuration memory terminal A1 + A2: Voltage supply EFI gateway
  - Terminal EFI2\_A + EFI2\_B: Connection 2 for intelligent SICK EFI safety devices
  - Terminal EFI1\_A + EFI1\_B: Connection 1 for intelligent SICK EFI safety devices
- Configuration connection:
  - To directly connect a PC and configure the systems using SICK CDS
- Two PROFINET IO connections (RJ-45)
  - For connection to PROFINET IO Master or other PROFINET IO Slaves

## Accessories

### System plug

Connection type	Usage	Type	Part no.
Screw-terminals	For EFI gateway	FX3-MPL100001	1047162

### Connecting cable

Cable type	Cable diameter	Cable material	Part no.
By the meter	Ø 6.9 mm	PVC	6030921

### Configuration connection cables

Figure	Description	Connection type	Cable length	Type	Part no.
	Connects the configuration connection to the PC	M8 x 4, SUB-D 9-pin	2 m	DSL-8D04G02M025KM1	6021195
			10 m	DSL-8D04G10M025KM1	2027649
	-	Connector RS-232, USB	35 cm	Converter RS-232 to USB	6035396

### Configuration software

Figure	Description	Type	Part no.
	CDS (Configuration & Diagnostic Software)	CDS	2032314



- Safety engineering: simple, direct and fast
- Attain CE marking systematically, efficiently and in compliance with the standards
- Structured implementation of the Machinery Directive and standards
- Hazard analysis and risk assessment
- Directives with full text
- Simplified documentation



## Product description

Software for safety engineering leads, step-by-step, towards CE certification and provides support during risk assessment. It also simplifies the documentation process.

Add-on modules are:

- Operating instructions assistant
- Check and acceptance assistant
- Standards packages with standards given in full, plain text

TÜV, Dekra and Trade Associations, as well as many companies, use Safexpert to assist in achieving high levels of safety.

## Benefit

### Simplified documentation

- CE marking and documentation in a single step
- Parallel preparation in drafting operating manuals
- Simplified adaptation when incorporating changes

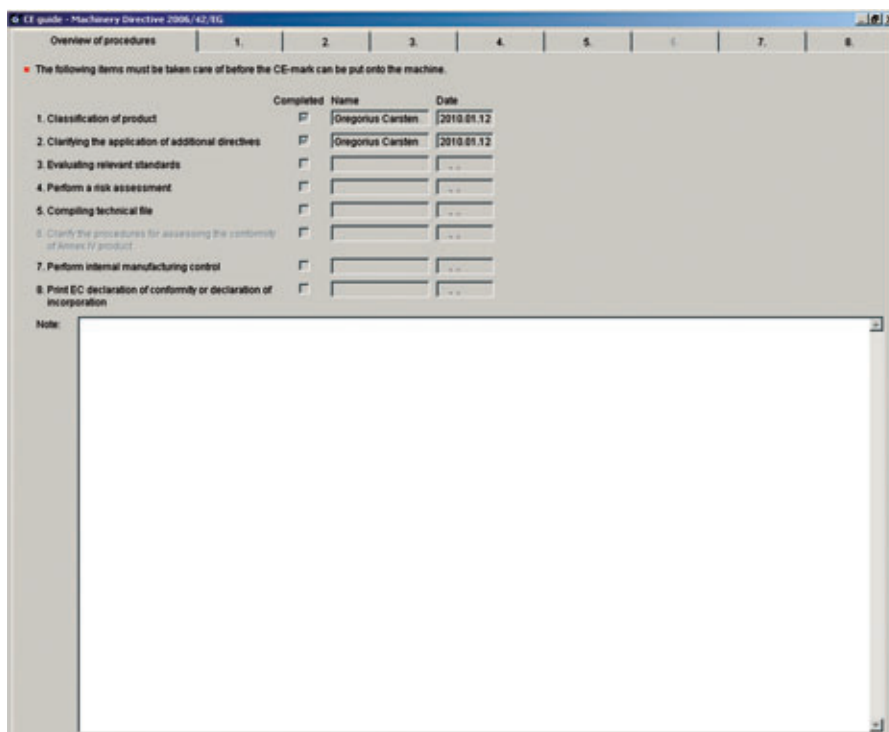
### Increased safety

- A structure for implementing the Machinery Directive
- No unanswered points are forgotten due to status monitoring
- Comprehensive risk assessment
- Proof of due diligence reduces liability

### Savings in time and costs

- Re-use of solutions saves up to 70 % time
  - Work parallel on projects
- "We have saved up to 70 % in terms of time and effort in carrying out CE certification by using Safexpert. Consequently, we can process a greater number of projects on a parallel basis. This shortens the overall throughput times for the projects and machines are available for service much more quickly." (Siemens VDO Automotive)

## CE guidelines



At the end of these 8 steps you can print out the hazard analysis and the declaration of conformity directly.

Further information	Page
→ Product information	Q-2
→ Systematic safety	A-0
→ Services	B-0



# Risk assessment

The screenshot displays the Safexpert risk assessment software interface. On the left, a tree view lists various hazard categories such as 'Use, space- and time limits', 'Mechanical hazards', 'Being run over', 'Being thrown', 'Crushing', 'Cutting or severing', 'Drawing-in or trapping', 'Work area of the portal system', 'Normal operation (1)', 'Setup, Maintenance and cleaning (2)', 'Entanglement', 'Friction or abrasion', 'Impact', 'Injection', 'Shearing', 'Slipping, tripping and falling', 'Stabbing or puncture', 'Suffocation', 'Contact with rough surfaces', 'Contact with sharp edges and corners, protruding parts', 'Contact with moving parts', 'Contact with rotating open ends', 'Falling or ejection of objects', 'Loss of stability', 'Break-up during operation', 'Displacement of moving elements', 'Projection of high pressure fluids', 'Uncontrolled movements', 'Other mechanical hazards', 'Electrical hazard', 'Burn', 'Chemical effects', 'Effects on medical implants', 'Electrocution', 'Falling, being thrown', 'Fire', 'Projection of molten particles', and 'Shock'. The 'Origin' section lists: Acceleration, deceleration (kinetic energy), Angular parts, Approach of a moving element to a fixed part, Cutting parts, Elastic elements, and Falling objects.

The central panel shows hazard details for '1. Limit of the machine: Use-, space- and time limits'. It includes fields for 'Hazard occurs' (Yes, No, Possibly), 'Hazard location' (Work area of the portal system), 'Phase of the machinery life' (Setup, Maintenance and cleaning), and 'Hazard description' (1 Mechanical hazards / 1.5 Drawing-in or trapping). A note states: 'For cleaning purposes, one must reach into the work area with the hood removed. Protective safety equipment is ineffective.'

The right panel shows a table of measures:

No.	Measure	Kind	Risk	Tasks
1	Control technical monitoring of protective hood	CSE	IN: 4 OUT: 3	0/0
2	The machine must only be cleaned while turned off or while in "setup" mode.	OI	IN: 6 OUT: 0	0/0

The 'Measures library' dialog box is open, showing a search for 'ME' and a list of measures:

No.	Measure description	Kind
1	mechanical guarding in accordance with EN 953 and EN ISO 13857	CMM
2	when door will be opened dangerous movements will be stopped (interlocks)	CCM

Safexpert guides the user through the conformity assessment procedure as per the Machinery Directive as well as the EN ISO 12100 standard. The performance level according to EN

ISO 13849 can be determined through the integrated interface to SISTEMA, a free available software wizard developed by DGUV, a testing and certification body in Germany.



## Product information

→ For up-to-date ordering information and release notes, see [www.sick.com/safexpert](http://www.sick.com/safexpert)

### Functions

	Basic	Compact	Professional
Safety project management	✓	✓	✓
Eight steps to the CE marking	✓	✓	✓
Risk assessment, including hazard list, as per EN ISO 14121-1	✓	✓	✓
StandardManager	-	✓	✓
Collection of graphics characters	-	✓	✓
Example of EU-compliant operating instructions template	-	✓	✓
Standards package "Standard" with 9 standards in original text	-	-	✓

### License editions

■ All of the licenses are network-compatible and floating licenses

Designation	Description	Software language	Language of standard/regulation
Safexpert Basic	You cannot combine the Basic version with the Safexpert Compact or Professional version	German, English, French	-
Safexpert Compact	Basic plus template for CE conformity to operating instructions, symbol database, StandardManager, and 4 weeks of access to an update server for the "Machine Directive EU" data package		-
Safexpert Professional	Compact plus nine full-text standards		English German
Safexpert upgrade Basic to Compact	For the expansion from Basic to Compact license editions	-	-

### Standards

#### Standard Plus

Designation	Description	Language of standard/regulation
Standard Plus package of standards without Safexpert software license	More than 50 full-text standards	German
		English
Standard Plus package of standards in combination with Safexpert Professional		German
		English

#### Standard

Designation	Description	Language of standard/regulation
Standard package of standards	Nine full-text standards; for the expansion of Safexpert Compact to Safexpert Professional	German
		English

## Single standards

Designation	Standard/regulation	Language of standard/regulation
Standard EN ISO 10218-1: Industrial robots – safety	EN ISO 10218-1	German
		English
Standard EN ISO 11200: Noise emitted by machinery and equipment – guidelines	Norm EN ISO 11200	German
Standard EN ISO 11688-1/AC1 1999: Acoustics – recommended practice for the design of low-noise machinery and equipment – correction	EN ISO 11688-1/AC1:1999	German
Standard EN ISO 11688-1 1998: Acoustics – recommended practice for the design of low-noise machinery and equipment	EN ISO 11688-1:1998	German
Standard EN ISO 11689: Acoustics – procedure for the comparison of noise emission data for machinery and equipment	EN ISO 11689	German
Standard EN 1299: Mechanical vibration and shock. Information for the application of source isolation	EN 1299	German
Standard EN 692: Mechanical presses – safety	EN 692	German
		English
Standard EN 693: Hydraulic presses – safety	EN 693	German
		English
Standard EN ISO 12100: General principles for design – risk assessment and risk reduction	EN ISO 12100	German
		English

Additional standards available upon request

## StandardManager

### License editions

Designation	Description
StandardManager	Can be used separately; supplied with Safexpert Compact and Safexpert Professional; includes floating and network-compatible licenses

### Data packages

Designation	Description	Country/region
EU Plus	Data records on standards and directives that are or have been published in the Official Journal of the EU that pertain to low voltage, EMC, ATEX and pressure equipment directives. It contains the relevant standards from CEN, CENELEC and EU and is an ideal supplement to the MRL-EU package.	For CE-certification, EU
MRL-DE	Replaces the previous SDR-DE. Data records on standards and technical specifications based on "9. GPSGV" (German ordinance on the equipment and product safety law), e.g. for the GS marking. It contains the related data from DIN, VDE, DKE, HVBG, VdTÜV, BRD.	For CE-certification, Germany
MRL-EU	Replaces the previous SDR-EU. Data records on standards and directives that are or have been published in the Official Journal of the EU that pertain to the Machinery Directive. It contains the relevant standards from CEN, CENELEC and EU.	For CE-certification, EU



## Check and acceptance assistant

Designation	Description	Standard/regulation	Language of standard/regulation
Check and acceptance assistant	Incl. checklist according to the Machinery Directive 2006/42/EC. Can be used separately; includes floating and network-compatible licenses	-	English
			German
Checklist for the check and acceptance assistant	-	According to German Health and Safety at Work	German
		According to EN ISO 12100	German

## Operating instructions assistant

Designation	Description
Operating instructions assistant	Safexpert required; for Safexpert Basic, please also order the template for operating instructions

## Updates

### Standards

Designation	Language of standard/regulation
Standard Plus Update	German
	English
Standard Plus Update in combination with Professional and service contract	German
	English
Standard Update	German
	English
Standard Update in combination with Professional and service contract	German
	English

## Service and update contracts<sup>1)</sup>

Designation	Description
Update contract for Safexpert Basic	Includes the update contract for the "Standard" package of standards
Update contract for Safexpert Compact	
Update contract for Safexpert Professional	Includes the update contract for the "Standard" package of standards; 70 % discount on new standards in the standards packages
Update contract for Standard Manager	-
Update contract for Safexpert check and acceptance assistant	
Update contract for operating instructions assistant	
Update contract for standard package Standard Plus	Full-text standards will cost an additional 30 %

<sup>1)</sup> A contract is valid for 1 year. If the contract is not cancelled on the termination date, it is automatically extended for another year.





Abbreviation/term	Explanation
<b>A</b>	
Actuation duration (reset button)	Time that a reset button must be operated to reset the safety relay. → Reset/restart
Actuator, actor	Actuator: component, e.g., servomotor, clutch, solenoid valve or similar, for intervening in the process.
Actuator-Sensor Interface	Open bus system for the lowest automation level. Enables sensors, actuators and integrated systems to be easily connected to the first control level. Master-slave principle, up to 496 binary outputs per network, analog I/Os possible, electronic address setting over the bus connection, unscreened 2-core ribbon cable, information and power supply on one cable, reverse-polarity protected connection technology. → <a href="http://www.as-interface.com">www.as-interface.com</a>
ADO      Application diagnostic output	Configurable signal output that indicates a specific status of the protective device.
Ambient temperature, max.	The highest permissible temperature of the ambient air, or another medium, at which the full functionality of a piece of equipment is still guaranteed.
Ambient temperature, min.	The lowest permissible temperature of the ambient air, or another medium, at which the full functionality of a piece of equipment is still guaranteed.
ANSI      American National Standards Institute	Promotes and manages American industrial standards. → <a href="http://www.ansi.org">www.ansi.org</a>
AOPD      Active opto-electronic protective device	A device whose sensing function is performed by opto-electronic emitting and receiving elements detecting the interruption of optical radiations generated within the device by an opaque object present in the specified detection zone ( <i>IEC/TS 61496-2, CLC/TS 61496-2</i> ). In DIN EN 692 "Mechanical presses", EN 693 "Hydraulic presses" and EN 12622 "Hydraulic press brakes", the abbreviation <b>AOS</b> is used as a synonym for <b>AOPD</b> .
AOPDDR      Active opto-electronic protective device responsive to diffuse reflection	Device with a sensor function, produced by opto-electronic sender and receiver elements, that detects the diffuse reflection of light, generated by the device and reflected by an object in a defined two-dimensional protective field ( <i>IEC/TS 61496-3, CLC/TS 61496-3</i> ).
AOS	→ AOPD
AS-Interface Safety at Work	Extension of the AS-interface system with safety-related components that uses a combination of AS-interface safety monitor and safe AS-interface bus nodes.
AS-Interface Safety at Work Safety Monitor	One or more safety monitors integrated in the AS-interface system monitor safe AS-interface bus nodes and shut down the protected part of the machine so that the dangerous state of the machine is brought to an end.
A-type standards	Basic safety standards that contain basic terminology, principles of design, and general aspects that apply to all machinery, devices and systems.
<b>B</b>	
B <sub>10d</sub>	Number of cycles after which a dangerous failure has occurred on 10 % of the components (for pneumatic and electromechanical components).
Beam coding	Beam coding ensures that the receiver only detects and evaluates light from the sender to the receiver.
Beam separation	Distance between the centers of the beams on a multi-beam photoelectric safety switch.
Blanking	Blanking of a specific section of the protective field for a safety light curtain. This section is then inactive. There are two types of blanking: <ul style="list-style-type: none"> <li>▪ Fixed blanking permits a specific, fixed part of the protective field to be blanked. This function is selected, e.g., if a fixed part of a unit protrudes into the protective field.</li> <li>▪ Floating blanking permits a specific number of light beams from the safety light curtain to be interrupted without the output of a stop signal. This function is selected if the permitted interruption of the protective field does not relate to a fixed position in the protective field, e.g., if a cable or hose is moved through the protective field.</li> </ul> In both cases, the detection capability of the ESPE in the residual protective field is ensured.

Abbreviation/term	Explanation
<b>Blind zone</b>	Zone in front of a sensor in which an object or a reflector is not detected.
<b>B-type standards</b>	<p>Group safety standards that address a safety aspect or a type of safety-related equipment that can be used for a wide range of machinery, devices and systems.</p> <ul style="list-style-type: none"> <li>▪ B1-type standards address special safety aspects, e.g., the electrical safety of machinery (IEC 60204-1/EN 60204-1), the calculation of safety distances (ISO 13855).</li> <li>▪ B2-type standards address safety equipment, e.g., two-hand controls, interlocking equipment, pressure-sensitive protective equipment, guards, electro-sensitive protective equipment (IEC 61496-1/EN 61496-1).</li> </ul>
<b>Bus system, bus</b>	<p>Common cable for the transmission of data and control information between different components and systems using a defined protocol. A differentiation is to be made between parallel and serial buses.</p> <ul style="list-style-type: none"> <li>▪ Parallel bus systems have a large number of wires that allow data, address or control information to be transmitted as parallel bits. They are used as plug-in bus systems for the connection of plug-in modules and as peripheral buses for connecting computers to their local I/O devices.</li> <li>▪ Serial bus systems transmit data between components that are distributed over a wide area in a system. This data is transmitted as serial bits using a common medium (two-core or multi-core cable, coaxial cable or fiber-optic cable) and, as a result, drastically reduce the wiring effort compared to conventional wiring. Familiar examples are: DeviceNet, PROFIBUS, Interbus, CAN, PROFINET IO, AS-interface, etc.</li> </ul>
<b>C</b>	
<b>Cascadable</b>	Describes the feature, particularly on light curtains, that allows a basic device (host) to be connected by a cable to an additional device(s) (guest).
<b>Category</b>	Categorization of the safety-related parts of a control system in relation to their resistance to failures and their subsequent behavior in the event of a failure.
<b>CDS</b>	<b>Configuration &amp; diagnostic software</b> Configuration and diagnostics software for SICK safety systems.
<b>CE label</b>	This label on products comprises the letters CE and indicates conformity with all EU directives that apply to the labeled product. The label states that the person or legal entity that applied the label, or had it applied, has ensured that the product complies with all the Union's directives for complete harmonization and has been subjected to all the stipulated conformity assessment procedures.
<b>CENELEC</b>	<b>Comité Européen de Normalization Electrotechnique</b> European Committee for Electrotechnical Standardization. Responsible for the harmonization of electrotechnical standards within the European Union and the entire European Economic Region. → <a href="http://www.cenelec.be">www.cenelec.be</a>
<b>CLC</b>	Prefix for standards adopted by CENELEC.
<b>Concurrence monitoring</b>	Simultaneous operation of the start buttons is monitored and is stipulated for two-hand controls. The output contacts are only switched if the state of both start buttons changes within 0.5 s.
<b>Contamination control</b>	Prior to the failure of the sensor, the contamination control indicates an unsatisfactory signal reserve due to maladjustment or contamination (for optical sensors).
<b>Cross-circuit/short-circuit detection</b>	Detection of cross-circuit/short-circuit, or a reduction in the insulation resistance between contact and contact, or short-circuit between core and core, or more than one single conductor cable.
<b>CSA</b>	<b>Canadian Standards Association</b> The Canadian Standards Association prepares standards for improving public safety and health, protecting the environment and easing trade. CSA tests and certifies the electrical properties and the safety of products. It is recognized by → OSHA as a national, recognized test laboratory for testing all products that fall under the responsibility of OSHA. → <a href="http://www.csa.ca">www.csa.ca</a>

Abbreviation/term	Explanation
C-type standards	C-type standards contain all safety requirements for a specific machine or a type of machine. If this standard exists, it has priority over the A-type or B-type standard. Nevertheless, a C-type standard can refer to an A-type standard or a B-type standard. If there is no C-type standard for a machine, conformity can be achieved based on the A-type or B-type standard. In all circumstances, the requirements of the Machinery Directive must be met.
<b>D</b>	
Dangerous state	State that can result in injuries to people. Safety devices prevent this hazard if the protective device is used correctly.
DeviceNet™	Simple CAN-based communication system for networking industrial automation equipment with higher-ranking control equipment. The transmission medium uses two twisted, screened pairs of wires inside one cable. One pair is used for communication and the other for the supply of power to the equipment connected. → <a href="http://www.odva.org">www.odva.org</a>
<b>E</b>	
EDM External device monitoring	Means by which the electro-sensitive protective equipment (ESPE) monitors the state of control devices that are external to the → ESPE (IEC 61496-1/EN 61496-1). EDM can be realized by safe control solutions. → Monitoring function for downstream devices
EFI Enhanced function interface	Safe SICK device interface for the transmission of safety relevant signals. A bus interface to a safe fieldbus is possible using the SICK network solutions.
EMC Electromagnetic compatibility	Ability of a piece of equipment to work satisfactorily in its electromagnetic environment and, at the same time, not to excessively interfere with other pieces of equipment.
Enclosure ratings	Enclosure ratings describe a machine's or sensor's level of protection against physical contact and penetration of foreign bodies and water. IEC 60529 describes standardized degrees of protection with which the housing of a product complies if the product is correctly installed. The enclosure rating code starts with the letters IP (ingress protection); the first digit indicates the level of protection against accidental contact and foreign bodies. The second digit describes the protection against the penetration of water. In industry, an enclosure rating of IP 65 has become established as the standard.
Entry/Exit	Innovative muting alternative for access protection: Muting sensors and muting lamps are no longer required. Additional protection measures (e.g., hinged doors) are generally not required.
ESD Electrostatic discharge	Electrostatic discharge: Equalization of charge between differently electrostatically charged fixed, gaseous or liquid media. The currents generated during discharge can damage or destroy electronic components, or impair the function of electronic devices. These effects on devices are covered by legislation on electromagnetic compatibility. When handling electronic components, assemblies and devices, discharges from the body during e.g., transport, mounting, testing, repair and service, are of significance.
ESPE Electro-sensitive protective equipment	Assembly of devices and/or components working together for protective tripping or presence-sensing purposes and comprising, as a minimum (IEC 61946-1/EN 61946-1): <ul style="list-style-type: none"> <li>▪ a sensing device</li> <li>▪ controlling/monitoring devices</li> <li>▪ output signal switching devices (OSSD)</li> </ul> They are used to protect people at machines and systems that have a risk of injury. They cause the machine or system to adopt a safe state before a person can be exposed to a hazardous situation.
<b>F</b>	
Fieldbus	Bus system in close proximity to the process for the direct connection of intelligent sensors and actuators. On a fieldbus, smaller quantities of data are transmitted digitally between sensors and actuators and control equipment. The data must be transmitted as quickly as possible, i.e. the data should be transmitted close to real time. In addition, a fixed minimum and maximum response time must be guaranteed.

Abbreviation/term	Explanation
FSD      Final switching device	The component in the safety-related control system on the machine that interrupts the circuit to the Machine Primary Control Element (MPCE) if the switching output (OSSD) changes to the off state.
Functional safety	Part of the overall safety of the machine and the machine control system that depends on the correct function of the → SRECS, on safety-related systems in other technologies and on external features for risk reduction.
<b>G</b>	
Guards	A fundamental differentiation is made between “fixed” and “movable” guards. <ul style="list-style-type: none"> <li>▪ Fixed guards are used for hazardous points where it is unnecessary, or only seldom necessary, to make changes. As a rule, they are fixed in place and can only be removed with tools.</li> <li>▪ Movable guards are used if it is necessary to make changes at the hazardous point to operate the machine, to rectify malfunctions or during setup. These guards are monitored using → Safety switches.</li> </ul>
<b>H</b>	
Hazardous area	A hazardous area is any area in a machine and/or around a machine in which a person can be subjected to a hazard ( <i>ISO 12100-1/EN ISO 12100-1</i> ).
<b>I</b>	
Interface	Connection point between two devices or systems. The devices/systems on each side of an interface are connected together using an interface cable via which data, addresses, and control signals are exchanged. In this context, the term interface covers the entirety of the functional, electrical and design conditions (coding, signal level, pin assignments) that characterize the connection point between the devices or systems.
Interlocking	An interlocking device is a mechanical, electrical or other device that prevents a machine from operating element under certain circumstances.
IP	→ Enclosure ratings
ISO      International Organization for Standardization	Worldwide federation of national standards institutes in 148 countries. The term ISO is not an acronym for the name of the organisation, but comes from the first three letters of the Greek word “isos”, which roughly means “equal”. → <a href="http://www.iso.ch">www.iso.ch</a>
<b>L</b>	
Laser      Light amplification by stimulated emission of radiation	Amplifier for electromagnetic waves in the visible light spectrum
Laser protection class	Categorization of laser equipment into classes. In the classes 1 to 4, limits are set for photochemical hazards for the accessible radiation.
LED      Light emitting diode	Light emitting diode (luminescence diode)
Light curtain	An AOPD with a resolution $\leq 116$ mm
Light spot	Light spot dimension, determining the sensor’s resolution.
Locking force	Maximum force with which a guard can be safely locked.

Abbreviation/term	Explanation
<b>M</b>	
<b>Machinery Directive</b>	<p>The Machinery Directive 2006/42/EC is intended for manufacturers of machines and safety components, and organizations placing machines and safety components on the market. It defines tasks for meeting the health and safety requirements for new machines, with the intention of removing trade barriers within Europe and guaranteeing users and operators a high level of safety and health protection.</p> <p>It is applicable to the production of machinery as well as to safety components placed on the market individually, and is also applicable to second-hand machinery and devices from other countries that are to be placed on the market in the EU for the first time (e.g., from the USA or Japan).</p> <p>From 29.12.2009, only the Machinery Directive 2006/42/EC is to be applied!</p>
<b>Master</b>	Central bus user that controls bus access. All other bus users work as slaves.
<b>Master/slave principle</b>	The master element defines the instructions, slave elements follow the instructions from the master. For example, with decentralized bus controls an automation device, as the master element, assigns the access rights for the other components (slave elements).
<b>Mechanical unlocking mechanism</b>	Is used to unlock a safety switch from the outside.
<b>Minimum distance</b>	Calculated distance between the safeguard and the hazardous area necessary to prevent a person or part of a person reaching the hazardous area before the termination of the dangerous machine function.
<b>Minimum shutdown time</b>	Minimum time necessary to detect an infringement of the protective field on the input circuit on the relay. At values below this minimum figure, an incorrect situation will not be detected, or the relay will switch to the error state.
<b>Minimum switch-on time</b>	Minimum time that a signal must be present on the input circuit before a reset can be performed (change from LOW to HIGH).
<b>Monitoring function for downstream devices</b>	<p>The external monitoring device (→ EDM) must provide the necessary means for the connection to the signals from the external devices (e.g., MPCE(s), FSD(s), muting devices) so that the EDM can unambiguously monitor the status of such devices.</p> <p>The safety device must change to a locked state if an incorrect state is detected in one of the devices to be monitored by the EDM.</p>
<b>MPCE      Machine primary control element</b>	Element in the main circuit: The element that interrupts the main circuit to stop the machine ( <i>IEC 61496-1/EN 61496-1</i> ).
<b>Muting</b>	Temporary automatic suspension of one or more safety functions by safety-related parts of the control system ( <i>IEC 61496-1/EN 61496-1</i> ).
<b>Muting of an AOPD</b>	<p>Temporary automatic suspension of the safety function of an AOPD for a safety-relevant time. For example, the standard EN 415-4 (1997) for packaging machines addresses the problem of palletizers and de-palletizers (machines in which all work on the pallet load is performed automatically and only by the machine). At the entry and exit to the chamber (where under normal operating conditions there is a hazard), it is necessary to bridge the AOPD when the pallet moves past. However, it is also necessary to detect the entry of people. The muting system must be able to differentiate between the pallet and the operator.</p> <p>The muting conditions that are defined in the standard EN 415-4 state that:</p> <ul style="list-style-type: none"> <li>▪ Muting is only allowed to be activated during the period of time in the working cycle when the loaded pallet blocks access to the hazardous area.</li> <li>▪ Muting should be automatic.</li> <li>▪ Muting must not be dependent on a single electrical signal.</li> <li>▪ Muting must not be entirely dependent on software signals.</li> <li>▪ Muting signals occurring during an invalid combination must not permit any muting state, and it must be ensured that the protective function is retained or leads to a machine stop.</li> <li>▪ The muting state is lifted immediately after the pallet has passed through and the protective device is reactivated.</li> </ul>

Abbreviation/term		Explanation
Muting-dependent manual bridging		An optional function on an ESPE, also called override. This function permits activation of the muting function, and thus the bridging of the ESPE, by the manual operation of a control switch for the purpose of, e.g., clearing blockages in the muting area on a roller conveyor. The override function must only be able to be activated when at least one muting sensor is active. The manually initiated override is deactivated automatically after either a correct muting sequence or a pre-set time ( <i>IEC 61496-1/EN 61496-1</i> ).
<b>N</b>		
NC		Normally Closed NC contact
NO		Normally Open NO contact
Number of beams		Number of beams of a multiple light beam safety device
Number of protective fields		Number of switchable protective fields of an → AOPDDR
<b>O</b>		
Operating voltage, max.		The maximum operating voltage is the upper limit for the voltage used to supply the equipment with power for operation. The specified maximum operating voltage must not be exceeded, especially not by the maximum peaks on any residual ripple.
Operating voltage, min.		The minimum operating voltage is the lower limit for the voltage used to supply the equipment with power for operation so that the equipment continues to function. The voltage must not drop below the specified minimum operating voltage, especially not by the minimum peaks on any residual ripple.
OSHA	Occupational Safety & Health Administration	Authority for health and work safety. Responsible for work safety regulations in the USA. OSHA has the task, by means of the preparation and implementation of directives, to safeguard the health and safety of the American worker, to provide means for training, and to promote the continuous improvement of health and work safety. → <a href="http://www.osha.gov">www.osha.gov</a>
OSSD	Output signal switching device	The part of the electro-sensitive protective equipment (ESPE) that is connected to the machine control, and that changes to the off state when the sensor section is triggered during correct operation.
Output current, max.		Maximum permissible load current on the output
Output current, min.		Minimum load current necessary on the output
Output signal switching device		→ OSSD
Output switching element OSSD		→ OSSD
Outputs, safe		→ OSSD
Override		→ Muting-dependent manual bridging
<b>P</b>		
PDF		Proximity Device with defined behavior under fault conditions
PDF category		Describes the behavior of a proximity device under fault conditions.
PELV	Protective extra low voltage	Protective extra low voltage with safe isolation ( <i>IEC 60364-4-41</i> ). The protective measure PELV differs from → SELV (safety extra low voltage) only in the type of ground connectio. A PELV circuit is present if, for example, the secondary side is grounded for operational reasons. The nominal voltage shall not exceed 25 V AC or 60 V DC when the equipment is normally used in dry locations and when large area contact of live parts with the human body is not expected; or 12 V AC or 30 V DC in all other cases. For further requirements see <i>IEC 60204:2007 Subclause 6.4</i> .
PFHd	Probability of dangerous failure per hour	Mean probability of a dangerous failure per hour (1/h).

Abbreviation/term	Explanation
PL Performance level	Discrete level used to specify the ability of safety-related parts of control systems to perform a safety function under foreseeable conditions ( <i>ISO 13849-1/EN ISO 13849-1</i> ).
Positive opening	Positive opening on switches signifies that there must be positive, shape-based transmission of force between actuator and switching element. The actuating mechanism must be designed so that even on mechanical failure, e.g., on the fracture of a spring or contact welding, the contacts open reliably and remain open in the actuated state ( <i>IEC 60947-5-1/EN 60947-5-1</i> ).
Power-up delay	Time that the safety module requires to become ready for operation after application of the supply voltage.
Presence detection	Secondary protective device for machinery/systems that can be accessed from the floor and on which the system must be prevented from starting while the operator is in the interior (safety function: preventing start).
PROFIBUS PROFIBUS-DP	PROFIBUS (Process Field Bus) is the universal field bus, often used in production, process and building automation. PROFIBUS was developed by Siemens and the PROFIBUS user group and standardized according to IEC 61158. PROFIBUS enables communication between devices of different manufacturers without special interface adaptations. → <a href="http://www.profibus.com">www.profibus.com</a>
PROFIsafe	Profile for safety-related data transmission via the PROFIBUS network.
Protective field	The area in which the test object specified by the manufacturer is detected by the item of electro-sensitive protective equipment (ESPE). <ul style="list-style-type: none"> <li>▪ Safety light curtain: The protective field lies between the sender unit and receiver unit. The field is defined by the protective field height and the protective field width.</li> <li>▪ Safety laser scanner: The protective field secures the hazardous area on a machine or vehicle. The field is defined by the scanning range, scanning angle, response time and resolution of the device (see technical specifications).</li> </ul>
Protective field height for safety light curtains	Height of the active protective field along the longitudinal axis of the light curtain.
Protective field range	→ Scanning range
Protective field width for safety light curtains	This is given by the length of the light path between sender and receiver. To guarantee the safe protective function, the maximum permissible protective field width must not be exceeded.
PSDI control	An optional function on an item of ESPE with which the ESPE triggers the dangerous machine movement as well as its protective function. The following types of actuation are common: <ul style="list-style-type: none"> <li>▪ In the single break PSDI mode, the machine movement is started by interrupting and clearing the protective device's protective field.</li> <li>▪ In the double break PSDI mode, the machine movement is started by interrupting and clearing the protective device's protective field twice in succession.</li> </ul>
PSDI mode	This term refers to manual intervention at hazardous points during the machine working cycle. Therefore, a high level of safety for monitoring the protective device and for signal processing must be achieved. If these conditions are met, the start command can be given if the protective device returns to the correct protective setting. See also → Single break/double break PSDI mode.
<b>R</b>	
Radiation source	Source for beam generation using, e.g., semiconductor LEDs or conventional gas discharge lamps.
Reduced resolution	An optional function on → ESPE (particularly light curtains) with which several objects up to a certain size, that occasionally cause interruptions, can be tolerated in the protective field without → OSSDs switching to the off state, provided a certain number of neighboring light beams remain clear.
Reflector distance, min.	Minimal permissible distance between photoelectric reflex switch and reflector.
RES Reset inhibit	→ Restart interlock
Reset/restart	→ Reset → Restart

Abbreviation/term	Explanation
<b>Reset</b>	Resetting the protective device to the monitored state. <ul style="list-style-type: none"> <li>▪ Manual reset is provided by a separate device and operated manually, e.g., using a reset button.</li> <li>▪ Automatic reset by the protective device is only allowed in a special case: It shall not be possible for persons to be in the hazardous area without the protective device triggered or it shall be ensured there are no persons in the hazardous area during and after reset.</li> </ul>
<b>Reset time</b>	Time between operating the reset (in the “safe” state) and the “enabled” state. The time starts: <ul style="list-style-type: none"> <li>▪ with manual reset on release of the reset button (except UE23-2 MF safety relay).</li> <li>▪ with automatic reset upon closing the input circuits (e.g., closing the interlocked door).</li> </ul>
<b>Response delay time</b>	Time by which the response of the contacts is delayed. The times can be adjusted on switching devices with response delay.
<b>Response time</b>	The maximum time between the occurrence of the event that caused the triggering of the sensor and the achievement of the off state at the output switching elements (OSSDs).
<b>Restart</b>	Placing the machine back in operation. After the triggering of the protective function or after a fault, the protective device can be reset to make it possible to subsequently restart the machine.
<b>Restart interlock</b>	Means of preventing automatic restarting of a machine after actuation of the sensing device during a hazardous part of the machine operating cycle, after a change in mode of operation of the machine, and after a change in the means of start control of the machine ( <i>IEC 61496-1/EN 61496-1</i> ). <ul style="list-style-type: none"> <li>▪ Operating modes include:               <ul style="list-style-type: none"> <li>inching, single stroke, automatic</li> </ul> </li> <li>▪ Start control equipment includes:               <ul style="list-style-type: none"> <li>foot switch, two-hand control, single break PSDI triggering or double break PSDI triggering by the ESPE’s sensor function</li> </ul> </li> <li>▪ Restart interlock (RES):               <ul style="list-style-type: none"> <li>The machine stops and the restart interlock (RES) is engaged upon interruption of at least one light beam. This interlock ensures that the machine can only be restarted if the light path is clear and the reset button has been pressed and released again.</li> </ul> </li> </ul>
<b>Risk assessment</b>	Risk assessment is the complete procedure of identifying hazards, estimating and evaluating the associated risks. The risk assessment supports the selection of appropriate measures and the evaluation of their effectiveness. The risk assessment is described in EN ISO 14121. While essential requirements are aimed to provide a high level of safety, the resources must nevertheless be proportional to the risk involved. <p>The protection of an operator who manually inserts and removes parts in a metal press must not be considered in the same way as the protection of an operator who works on a machine where the worst-case risk is the trapping of a finger.</p> <p>Furthermore, one and the same machine can have different access points with varying levels of risk. For this reason, different measures can be adopted for different parts of the safety-related control for a machine.</p> <p>Against this background, the standard <i>ISO 13849-1/EN ISO 13849-1</i> aids designers in the definition of the performance for the various parts of the safety-related control based on the following parameters:</p> <ul style="list-style-type: none"> <li>▪ The possible severity of injury</li> <li>▪ The frequency and/or duration of exposure to the hazard</li> <li>▪ The possibility of preventing the hazard</li> </ul>
<b>Risk estimation</b>	Risk estimation is a part of the risk assessment. It is necessary to estimate the risk to determine the measures required to achieve the protection objectives and the resulting solutions. <p>The necessary safety solutions are defined taking into account the risk parameters and the severity of the hazard.</p>



Abbreviation/term	Explanation
<b>S</b>	
Safe outputs	→ OSSD
Safety command devices	These switches are manually operated control switches. There are command devices for emergency stop function (emergency stop pushbuttons). There are also enabling devices designed for the setup mode while working in the hazardous area of machines and systems. In the "manual operating mode" the protective action of movable guards is disabled under certain conditions. Authorized personnel enter hazardous areas with the safety command device to carry out programming, setup, observation, repair, test or service work.
Safety function	Function of a machine whose failure can result in an immediate increase of the risk(s) ( <i>EN ISO 12100-1</i> ). A safety function is provided by safety-related parts of control systems (SRP/CS).
Safety sub-function	The part of a safety function that is provided by a safety-related sub-system (e.g., actuator) for risk reduction.
Safety switches	Safety switches are items of safety equipment for monitoring movable guards. On opening, they must safely open the circuit and keep it open until the guard is closed again. Safety switches with solenoid locks are locking devices that, in conjunction with the control, forcibly keep movable guards in the protective position until the dangerous states are brought to an end.
Safety switches category 1	Safety switches on which switching element and actuating element form a single unit.
Safety switches category 2	Safety switches on which switching element and actuating element do not form a single design unit, though on operation they are moved together or separated by the function.
Scanning range	The scanning range is the maximum possible distance (specified detection distance) between sender and receiver (through-beam photoelectric switch) or between sensor and reflector (photoelectric reflex switch) or the maximum range of the field of view (laser scanners) at which stable function can be guaranteed.
SDL Safety data link	SICK safety interface (connection for → OSSDs and → EFI)
Selection of several protective fields	An → AOPDDR can have several switchable protective fields.
Self-monitoring	Self-monitoring ensures that safety functions implemented by protective measures are also executed if the functionality of a component or element is reduced, or the process conditions have changed such that there are hazards. Self-monitoring detects a fault either immediately or performs periodic checks so that the fault is detected before the safety function is called up again. In both cases, the protective measure can be triggered immediately or delayed until a specific event occurs. (e.g., the start of a working cycle on the machine). ( <i>ISO 12100-1/EN ISO 12100-1</i> )
SELV Separated or safety extra low voltage	A SELV system is an electrical system in which the voltage cannot exceed ELV under normal conditions, and under single-fault conditions, including ground faults in other circuits ( <i>IEC 61140</i> ). A SELV circuit must provide: <ul style="list-style-type: none"> <li>▪ protective-separation (called double insulation, reinforced insulation or protective screening) from all circuits other than SELV or PELV that might carry higher voltages) or</li> <li>▪ simple separation from other SELV systems, from PELV systems and from earth.</li> </ul> The protective measure SELV differs from → PELV (Protective Extra Low Voltage). SELV circuits shall not be grounded on the secondary side or connected to other voltage systems. The maximum permissible nominal voltage for the protective measures SELV is 50 V AC and 120 V DC.
Sensor detection capability (resolution)	The limit for the sensor parameter, defined by the manufacturer, that causes the item of electro-sensitive protective equipment (→ ESPE) to trigger.
SIL Safety integrity level	Discrete level (one out of a possible three) for specifying the safety integrity requirements of the safety-related control functions to be allocated to the → SRECS. Safety integrity level three has the highest level of safety integrity and safety integrity level one has the lowest ( <i>IEC 62061/EN 62061</i> ).

Abbreviation/term	Explanation
SILCL      SIL claim limit	Safety integrity level claim limit (for a subsystem): Maximum SIL that can be claimed for a → SRECS subsystem in relation to architectural constraints and systematic safety integrity (IEC 62061/EN 62061).
Single break/double break PSDI mode	<p>This operating mode is advantageous if parts must be manually inserted or removed periodically. In this mode, the machine cycle is automatically re-initiated after the protective field becomes clear again after one or two interruptions.</p> <p>The reset device is to be operated under the following conditions:</p> <ul style="list-style-type: none"> <li>▪ on machine start</li> <li>▪ on restart if the → AOPD is interrupted during a dangerous movement</li> <li>▪ to initiate a restart after a period of more than 30 s (cf. IEC 61496-1/EN 61496-1)</li> </ul> <p>→ Further information EN 692</p> <p>Nevertheless, it is necessary to check that the operator cannot be placed at risk during the working process. This situation limits use to small machines on which the hazardous area cannot be entered and there is point-of-operation protection. All other sides of the machine must also be protected using suitable measures.</p> <p>If this operating mode is used, the resolution of the AOPD must be less than or equal to 30 mm (cf. ISO 13855, also EN 692, EN 693).</p> <p>In general, the following errors must be excluded when mounting protective devices: reaching over, reaching under, reaching around, standing behind.</p>
Slave	Participant in a network that can participate in the exchange of data only after contact from the master.
SRECS      Safety-related electrical control system	Electrical control system for a machine in which the failure will result in an immediate increase in the risk or risks
Standard housing	Defines whether the housing for a position switch complies with DIN 43693.
Switching element function	Design of the switching element as normally closed contact, normally open contact, positive action normally closed contact or changeover contact.
Switching elements	<p>The switching elements on safety switches have actuating elements driven by a shaped fitting. The switching element related to the safety function must be positively driven or, in the case of spring-action switching elements, must guarantee safe opening of the normally closed contacts when the positive separation point is reached. A differentiation is made depending on the switching behavior:</p> <ul style="list-style-type: none"> <li>▪ Slow-action switching element that opens or closes depending on the speed of its actuation.</li> <li>▪ Snap-action switching element that opens or closes independent of the speed of its actuation.</li> </ul>
Switching frequency	Number of sensor switching operations in a defined time interval.
Switching principle of safety switches	<ul style="list-style-type: none"> <li>▪ Slow-action switch: has a switching element that opens and closes depending on the speed of its actuation.</li> <li>▪ Snap-action switch: has a switching element that opens and closes independent of the speed of its actuation.</li> </ul>
Switching voltage OSSD HIGH, max.	Maximum switching voltage of the OSSD in the status HIGH.
Switching voltage OSSD LOW, min.	Minimum switching voltage of the OSSD in the status LOW.
Switch-off delay	Time by which the shutdown of the output contacts is delayed. This time is either fixed or adjustable depending on the device type.
Synchronization time monitoring	The switching of the input circuits within a defined time is monitored (only on automatic reset/restart). Enabling takes place only if input circuit 2 closes at most 0.5 s <i>after</i> input circuit 1. If input circuit 2 closes <i>before</i> input circuit 1, the control is not active.

Abbreviation/term	Explanation
<b>T</b>	
<b>T<sub>10d</sub></b>	Limit for the operating time of a component. Mean time until a dangerous failure has occurred on 10 % of the components $T_{10d} = \frac{B_{10d}}{n_{op}}$ The MTTFd determined for components subject to wear only applies for this time.
<b>Test rod</b>	An opaque cylindrical element used to verify the detection capability of the active opto-electronic protective device (AOPD) (IEC/TS 61496-2, CLC/TS 61496-2)
<b>Transmission medium</b>	Medium via which the interface transmits the data.
<b>Type of an ESPE</b>	The types of an ESPE differ in their performance in the presence of faults and under influences from environmental conditions. It is the responsibility of the machine manufacturer and/or the user to determine which type is required for a particular application. (See IEC 61496-1)
<b>Type of electrical connection</b>	Mechanical design of the electrical connection on the item of equipment. Designed as plug-in connection, soldered connection, crimp connection, screw connection, spring-action terminal, wire-wrap connection, cable entry via gland or plug.
<b>V</b>	
<b>Voltage type</b>	Design of the sensor as DC, AC or AC/DC.
<b>W</b>	
<b>Warning field output on safety laser scanners</b>	The part of the electro-sensitive protective equipment (ESPE) that is connected to the machine control and that changes to the off state when the warning field for the sensor section is triggered during correct operation.
<b>Warning field with safety laser scanners</b>	The warning field can be placed in front of the protective field and thus in front of the actual hazardous area. Objects in the warning field trigger, e.g., a warning signal. The size and shape of the warning field can be configured with the aid of the → CDS.

# Appendix – Sensor systems and safe control solutions from SICK

The following table gives an overview of the possible combinations between sensors and safe control solutions.

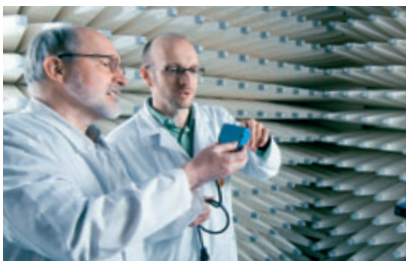
**Combination:**

- recommended
- ◐ possible
- on request
- not possible

		Connection via																																	
		S3000 Professional	S3000 Advanced	S3000 Standard	S3000 Remote	S3000 Professional CMS	S3000 PROFINET IO Professional	S3000 PROFINET IO Advanced	S3000 Cold Store	S3000 Expert	S3000 Professional	S3000 Advanced	S3000 Standard	S3000 Professional CMS	S200	S100	V200 / V300 Work Station Extended	C4000 Advanced	C4000 Standard	M4000 Advanced Curtain	C4000 Select	miniTwin4	C4000 Micro	C4000 Basic Plus	C4000 Basic	C4000 Eco	C4000 Entry/Exit	C4000 Palletizer	C4000 Fusion	miniTwin2	C2000 Standard	C2000 Eco	C2000 RES/EDM	C2000 Cascadable	
<b>Safety relays</b>																																			
UE10-2FG/UE12-2FG	Signal inputs	◐	◐	◐	-	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	-	◐	◐	◐	◐	◐	-	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
UE10-30S	Signal inputs	◐	●	●	-	●	◐	◐	◐	●	●	●	●	●	●	-	●	●	●	●	●	-	●	●	●	●	○	●	●	●	●	○	○	●	○
UE23	Signal inputs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
UE42-2HD	Signal inputs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
UE43-2MF/UE43-3MF	Signal inputs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
UE44-3SL	Signal inputs	○	○	○	-	○	-	-	○	○	○	○	○	-	○	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
UE45-3S1	Signal inputs	○	○	○	-	○	-	-	○	○	○	○	○	-	○	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
UE48	Signal inputs	◐	●	●	-	●	◐	◐	●	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>Safety controllers</b>																																			
Flexi Classic	Signal inputs	●	●	●	-	●	◐	◐	●	●	●	●	●	●	●	◐	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Flexi Soft	Signal inputs	●	●	●	-	●	◐	◐	●	●	●	●	●	●	●	◐	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	SDL/EFI	●	●	●	●	-	-	●	●	●	●	●	-	●	-	-	-	●	●	●	-	-	-	-	-	-	●	●	-	-	-	-	-	-	-
<b>Network solutions</b>																																			
<b>PROFIsafe</b>																																			
UE4155	Field signal inputs	◐	◐	◐	-	◐	-	-	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
	SDL/EFI	●	●	◐	●	●	-	-	●	●	●	●	-	●	-	-	-	●	●	●	-	-	-	-	-	-	●	●	-	-	-	-	-	-	-
<b>AS-i Safety at Work</b>																																			
UE3212	Field signal inputs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
UE4215	Field signal inputs	●	●	●	-	◐	◐	◐	◐	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>DeviceNet Safety</b>																																			
UE4421	Field signal inputs	◐	◐	◐	-	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
UE4457	Field signal inputs	◐	◐	◐	-	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
	SDL/EFI	●	●	●	●	-	-	●	●	●	●	-	●	-	-	-	●	●	●	-	-	-	-	-	-	-	●	●	-	-	-	-	-	-	-
UE4470	Signal inputs	●	●	●	-	●	○	○	●	●	●	●	●	●	●	◐	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>EFI gateways</b>																																			
UE1140 PROFIBUS	EFI	●	●	●	-	●	-	-	●	●	●	-	-	-	-	-	●	●	●	-	-	-	-	-	-	●	●	●	-	-	-	-	-	-	
UE1840 Ethernet (TCP/IP)	EFI	●	●	●	-	●	-	-	●	●	●	-	-	-	-	-	●	●	●	-	-	-	-	-	-	●	●	●	-	-	-	-	-	-	
UE1940 CANopen	EFI	●	●	●	-	●	-	-	●	●	●	-	-	-	-	-	●	●	●	-	-	-	-	-	-	●	●	●	-	-	-	-	-	-	
UE4140 PROFIBUS PROFIsafe	EFI	●	●	●	-	●	-	-	◐	●	●	●	-	-	-	-	●	●	●	-	-	-	-	-	-	●	●	●	-	-	-	-	-	-	
UE4740 PROFINET IO PROFIsafe	EFI	●	●	●	-	●	-	-	◐	●	●	●	-	-	-	-	●	●	●	-	-	-	-	-	-	●	●	●	-	-	-	-	-	-	
<b>Other relays</b>																																			
UE402	EFI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
UE403	EFI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



## SICK at a glance



### Leading technologies

With a staff of more than 5,000 and over 50 subsidiaries and representations worldwide, SICK is one of the leading and most successful manufacturers of sensor technology. The power of innovation and solution competency have made SICK the global market leader. No matter what the project and industry may be, talking with an expert from SICK will provide you with an ideal basis for your plans – there is no need to settle for anything less than the best.



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- Accident and operator protection with sensors, safety software and services
- Automatic identification with bar code and RFID readers
- Laser measurement technology for detecting the volume, position and contour of people and objects
- Complete system solutions for analysis and flow measurement of gases and liquids



### Comprehensive services

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- Application centers in Europe, Asia and North America for the development of system solutions under real-world conditions
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