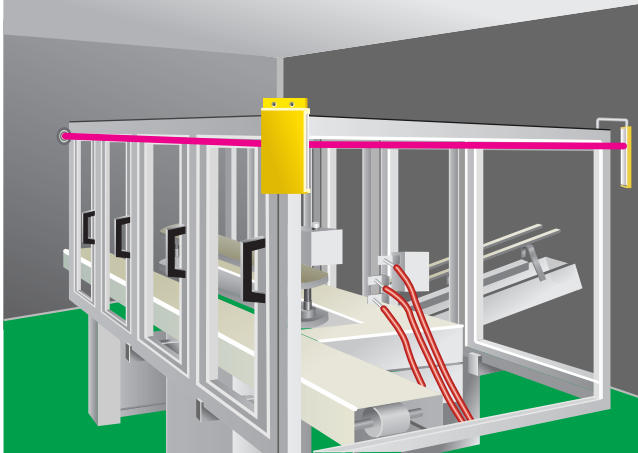
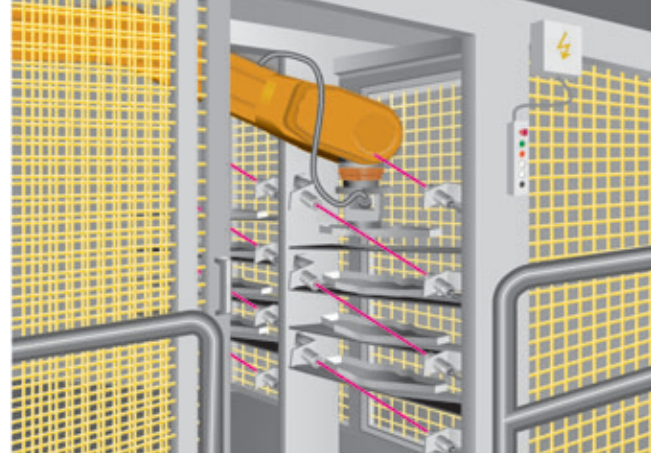


Single-beam photoelectric safety switches

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

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

H



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 ¹⁾	0 ... 5	-40 ... +55	M18 x 108	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	—	L4000/L41	H-2
				0 ... 10		M18 x 98						
				0 ... 60		M30 x 100						
	Type 4	PL e	8 ²⁾	0 ... 5	-20 ... +55	M18 x 108	—	✓ ²⁾	✓ ²⁾	—	L4000 Systems	H-9
				0 ... 10		M18 x 98						
				0 ... 60		M30 x 100						
Type 2	PL e	1	0.5 ... 20 15 ... 70	-25 ... +55	156 x 50 x 116	—	—	—	✓	WSU/WEU26-3	H-17	
Type 2	PL c	4 ¹⁾	0 ... 5	-40 ... +55	M18 x 108	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	—	L2000/L21	H-22	
			0 ... 16		M18 x 98							
			0 ... 60		M30 x 100							
			0 ... 25/35 ³⁾	-40 ... +60	80.6 x 24.6 x 54	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓	L2000/L27	H-29	
			0 ... 12/18 ³⁾	-40 ... +60	75.5 x 17.6 x 33.5	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	—	L2000/L28	H-34	

¹⁾ With Flexi Classic/Flexi Soft

²⁾ With UE401

³⁾ 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) ¹⁾
Performance level	PL e (EN ISO 13849) ¹⁾

¹⁾ 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

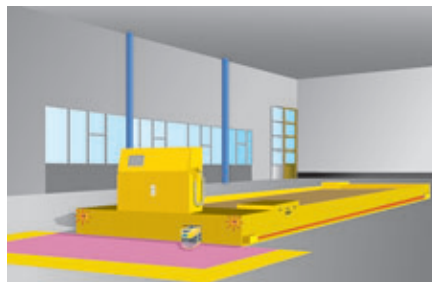
Combination with	Type of output	Type of output					Further information
		Number of sensors	Restart interlock	External device monitoring	Muting	Further information	
Flexi Classic main unit	PNP semiconductor, short-circuit protected, cross-circuit monitored	4	✓	✓	✓	0-2	
Flexi Classic extension unit		4	✓	✓	✓	0-2	
UE4470	Source output (PNP)	4	✓	✓	✓	P-17	
UE4457	Bipolar type	4	✓	✓	✓	P-32	

→ For more combinations, see annex

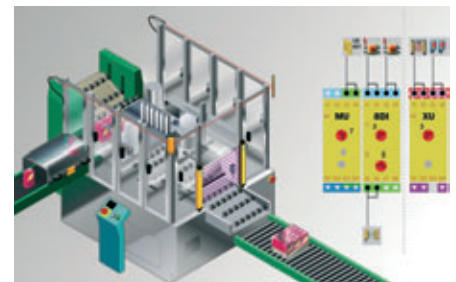
Applications

→ You can find more applications using the application finder at www.mysick.com

- 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

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) ¹⁾	
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) ¹⁾	
Category	Category 4 (EN ISO 13849) ¹⁾	
Performance level	PL e (EN ISO 13849) ¹⁾	
PFHd (mean probability of a dangerous failure per hour)	8.1 x 10 ⁻¹⁰ (EN ISO 13849) ¹⁾	
T _M (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	

¹⁾ Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

Electrical data

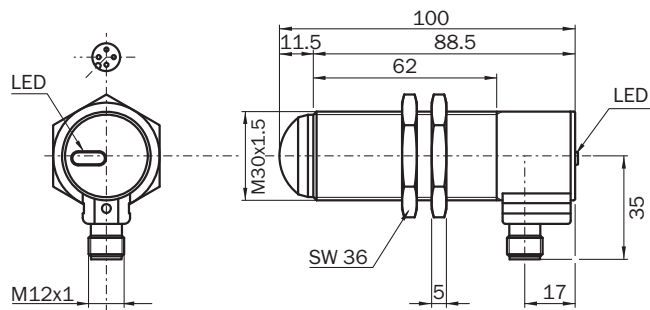
Connection type (depending on type)	Angled plug M12 x 4 / straight plug M12 x 4	
Supply voltage V _s	24 V DC (19.2 V DC ... 28.8 V DC)	
Maximum power consumption	20 mA	30 mA
Switching outputs	-	PNP, Q ¹⁾
Maximum response time	-	200 µs
Maximum switching current	-	70 mA

¹⁾ Short-circuit protected

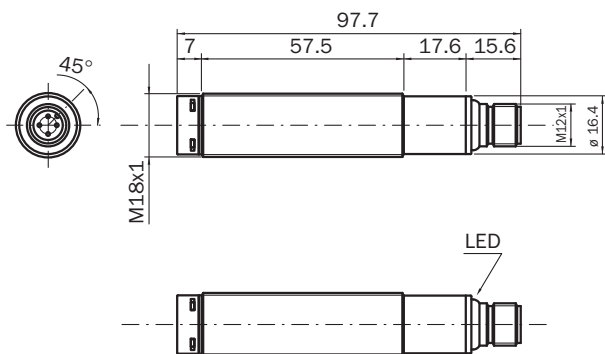


Dimensional drawings

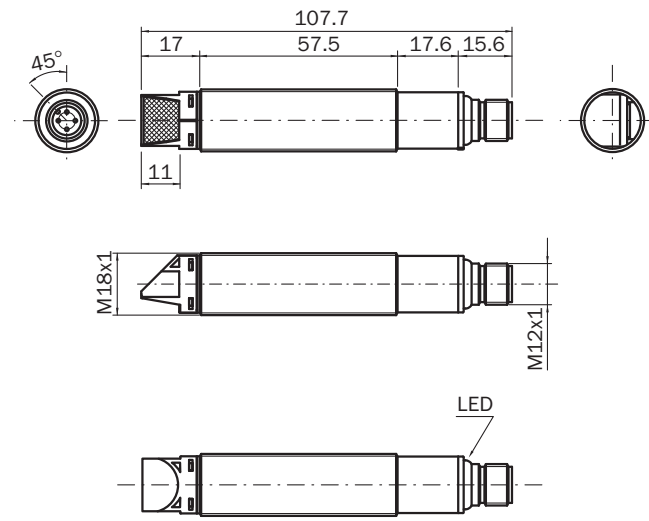
M30 axial



M18 axial



M18 radial



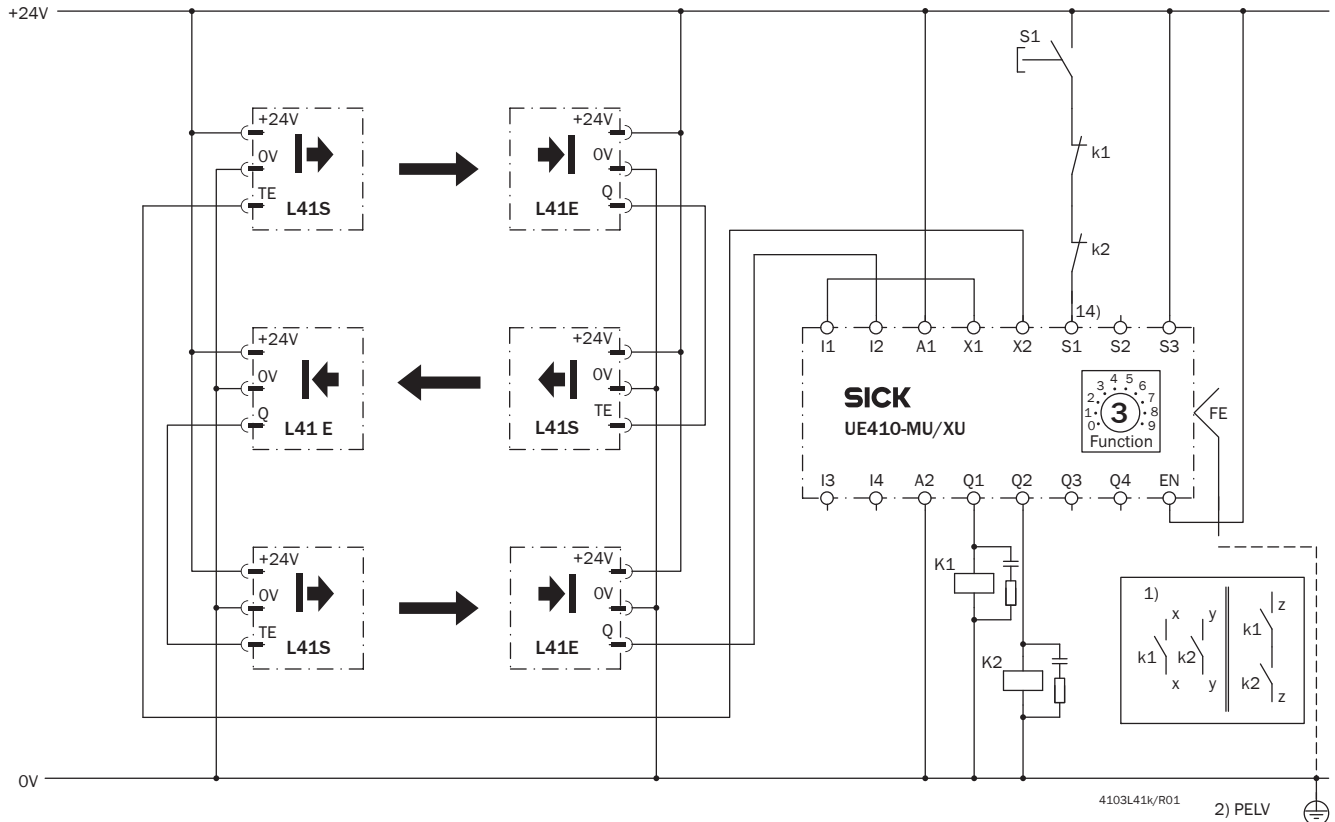
Dimensions in mm



Connection diagrams

→ You can find more connection diagrams at www.mysick.com

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

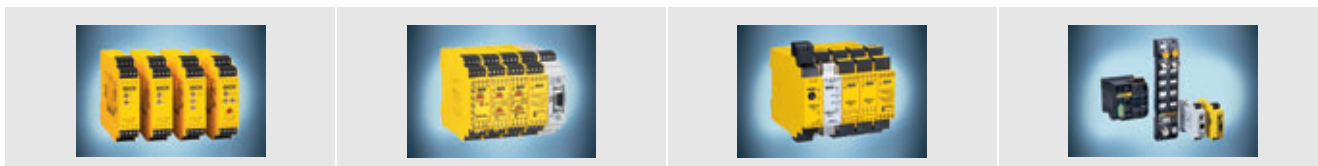
1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel 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.

H

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



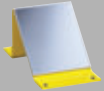
Mounting systems

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 ¹⁾

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

¹⁾ 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) ¹⁾
Performance level	PL e (EN ISO 13849) ¹⁾

¹⁾ 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

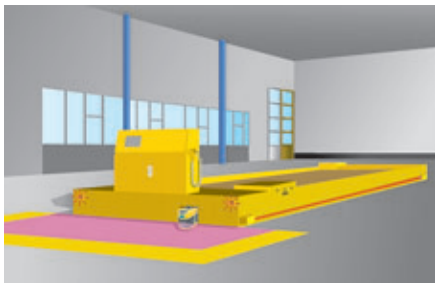
→ For more combinations, see annex

Applications

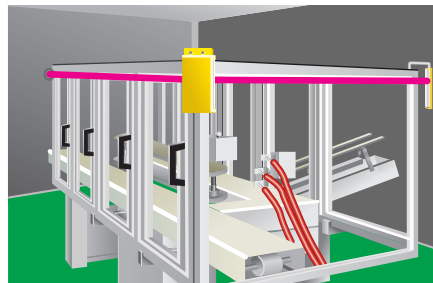
→ You can find more applications using the application finder at www.mysick.com

- 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

H

Technical specifications

→ You can find more detailed data in the operating instructions. Download at 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) ¹⁾</td> </tr> <tr> <td>Safety integrity level</td> <td>SIL3 (IEC 61508), SILCL3 (IEC 62061) ¹⁾</td> </tr> <tr> <td>Category</td> <td>Category 4 (EN ISO 13849) ¹⁾</td> </tr> <tr> <td>Performance level</td> <td>PL e (EN ISO 13849) ¹⁾</td> </tr> <tr> <td>PFHd (mean probability of a dangerous failure per hour)</td> <td>2.9×10^{-10} (EN ISO 13849) ¹⁾</td> </tr> <tr> <td>T_M (Mission Time)</td> <td>20 years (EN ISO 13849)</td> </tr> </table>								Type	Type 4 (IEC 61496) ¹⁾	Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) ¹⁾	Category	Category 4 (EN ISO 13849) ¹⁾	Performance level	PL e (EN ISO 13849) ¹⁾	PFHd (mean probability of a dangerous failure per hour)	2.9×10^{-10} (EN ISO 13849) ¹⁾	T _M (Mission Time)	20 years (EN ISO 13849)
Type	Type 4 (IEC 61496) ¹⁾																			
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) ¹⁾																			
Category	Category 4 (EN ISO 13849) ¹⁾																			
Performance level	PL e (EN ISO 13849) ¹⁾																			
PFHd (mean probability of a dangerous failure per hour)	2.9×10^{-10} (EN ISO 13849) ¹⁾																			
T _M (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															

¹⁾ Only in conjunction with UE401

Electrical data

Connection type	Plug M12 x 4							
Supply voltage V _s	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) ¹⁾
Safety integrity level	SIL3 (IEC 61508), SILCL3 (IEC 62061) ¹⁾
Category	Category 4 (EN ISO 13849) ¹⁾
Performance level	PL e (EN ISO 13849) ¹⁾
PFHd (mean probability of a dangerous failure per hour)	2.9×10^{-10} (EN ISO 13849) ¹⁾
T _M (Mission Time)	20 years (EN ISO 13849) ¹⁾
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

¹⁾ Only in conjunction with L40 sensors

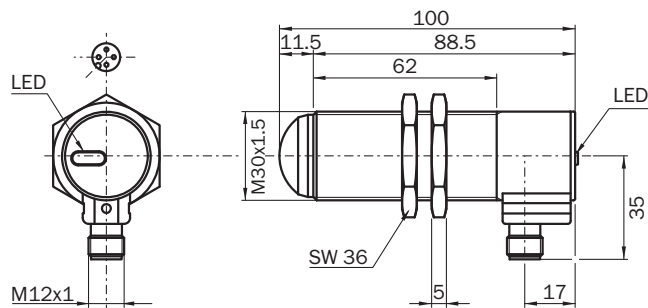
Electrical data

Supply voltage V _s	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 ² ... 2.5 mm ²

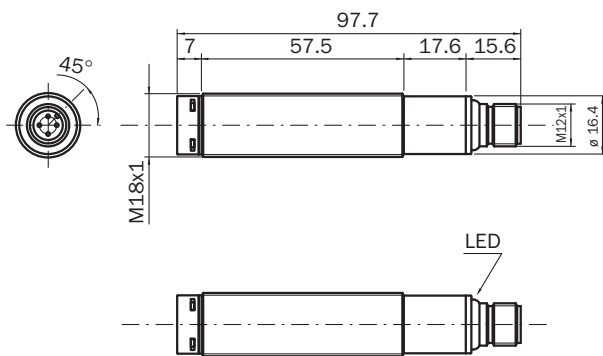


Dimensional drawings

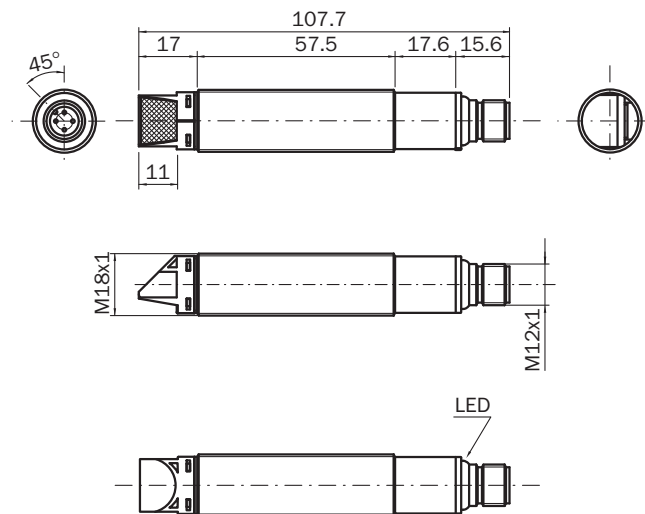
M30 axial



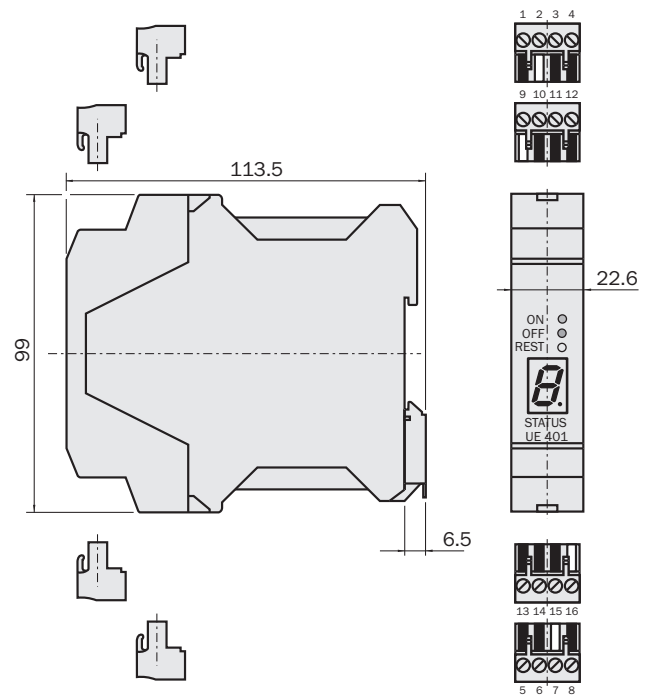
M18 axial



M18 radial



UE401 evaluation unit



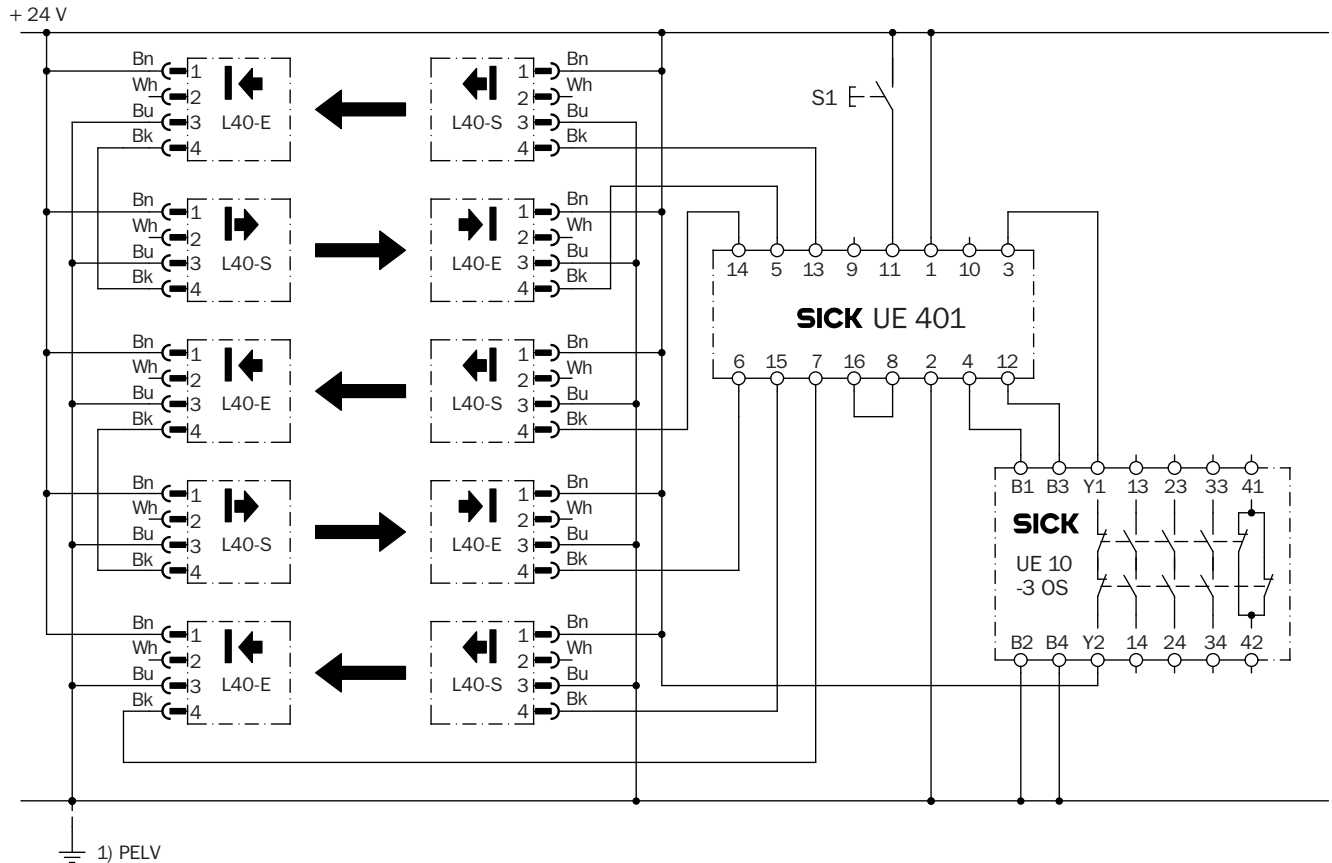
Dimensions in mm



Connection diagrams

→ You can find more connection diagrams at www.mysick.com

5 x L4000 (two pairs cascaded) on UE401 with UE10-30S



H

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

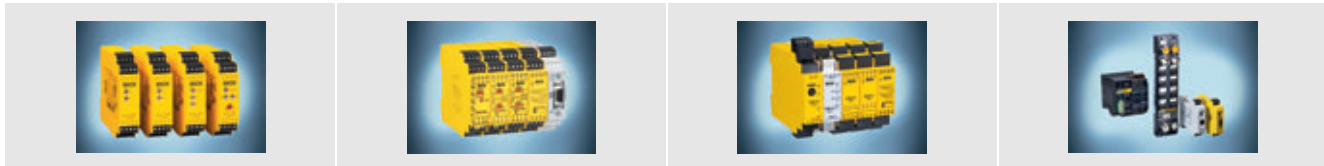
OSSD cross-circuits and short-circuits are detected and lead to the inhibited state (lock-out). The incorrect functioning of the UE10 will be detected and will not result in the loss of the shutdown function. Jamming of the S1 button prevents output circuit to enable.

Comments

¹⁾ 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



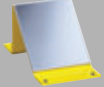
Mounting systems

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 ¹⁾

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

¹⁾ 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

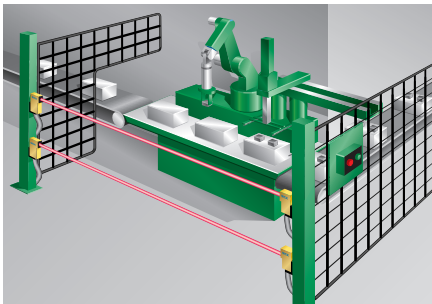
→ For more combinations, see annex

Applications

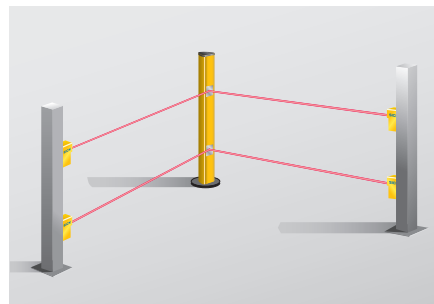
→ You can find more applications using the application finder at www.mysick.com

- 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

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) ¹⁾	
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 _{10d} parameter	1 x 10 ⁶ switching cycles (AC-15, 230 V, 0.4 A) 2.6 x 10 ⁵ switching cycles (AC-15, 230 V, 2.0 A) 1 x 10 ⁶ switching cycles (DC-13, 24 V, 0.6 A) 2 x 10 ⁵ switching cycles (DC-13, 24 V, 1.5 A)	
PFHd (mean probability of a dangerous failure per hour)	4.0 x 10 ⁻⁹ (EN ISO 13849)	
T _M (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	✓	

¹⁾ Requires safety extra-low voltage SELV/PELV



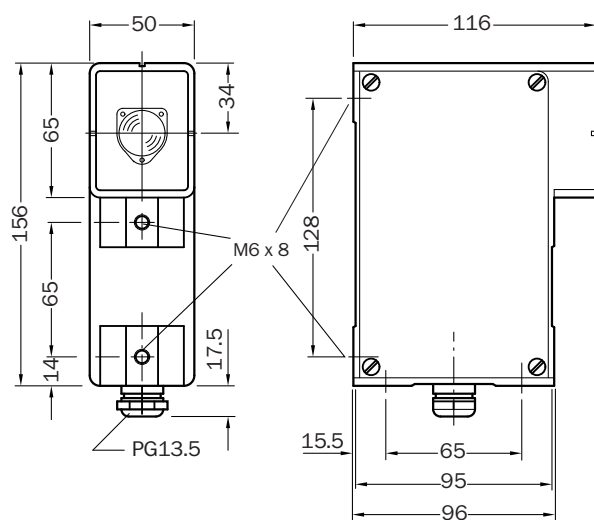
Electrical data

System part	Sender	Receiver
Connection type	PG gland	
Supply voltage V_s	24 V DC (19.2 V DC ... 28.8 V DC) ¹⁾	
Maximum power consumption	6 W	8 W
Switch-on time	Max. 10 s ²⁾	
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

¹⁾ 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.

²⁾ 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

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



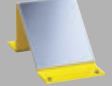
Mounting systems

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 ¹⁾


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

¹⁾ 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 μ F/220 Ohm for 110 V AC ... 220 V AC	RC-A	6001224
2.2 μ F/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

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) ¹⁾
Performance level	PL c (EN ISO 13849) ¹⁾

¹⁾ 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

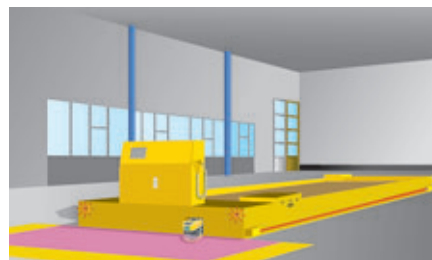
Combination with	Type of output	Number of sensors	Restart interlock	External device monitoring	Muting	Further information
Flexi Classic main unit	PNP semiconductor, short-circuit protected, cross-circuit monitored	4	✓	✓	✓	0-2
Flexi Classic extension unit		4	✓	✓	✓	0-2
UE4470	Source output (PNP)	4	✓	✓	✓	P-17
UE4457	Bipolar type	4	✓	✓	✓	P-32

→ For more combinations, see annex

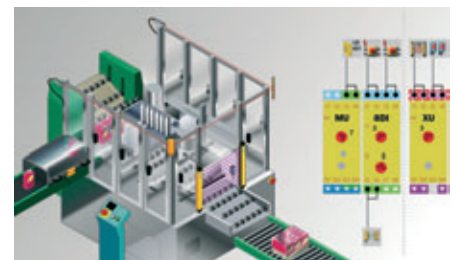
Applications

→ You can find more applications using the application finder at www.mysick.com

- 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
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→ 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	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

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) ¹⁾	
Safety integrity level	SIL1 (IEC 61508), SILCL1 (IEC 62061) ¹⁾	
Category	Category 2 (EN ISO 13849) ¹⁾	
Test rate (external test)	100/s (EN ISO 13849) ²⁾	
Maximum demand rate	60/min (EN ISO 13849) ³⁾	
Performance level	PL c (EN ISO 13849) ¹⁾	
PFHd (mean probability of a dangerous failure per hour)	1.0 x 10 ⁻⁶ (EN ISO 13849) ¹⁾	
T _M (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	

¹⁾ Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

²⁾ The test rate shall not be exceeded

³⁾ Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.

Electrical data

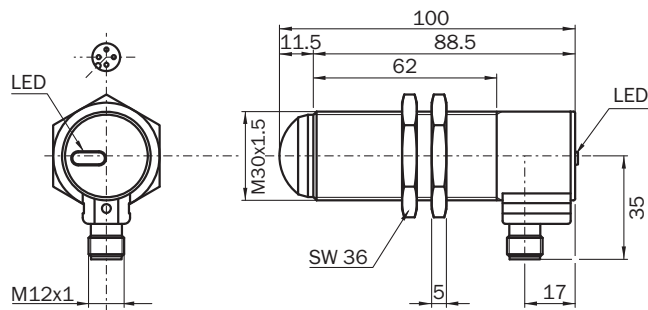
Connection type (depending on type)	Angled plug M12 x 4 / straight plug M12 x 4	
Supply voltage V _s	24 V DC (19.2 V DC ... 28.8 V DC)	
Maximum power consumption	20 mA	30 mA
Switching outputs	-	PNP, Q ¹⁾
Maximum response time	-	200 µs
Maximum switching current	-	70 mA

¹⁾ Short-circuit protected

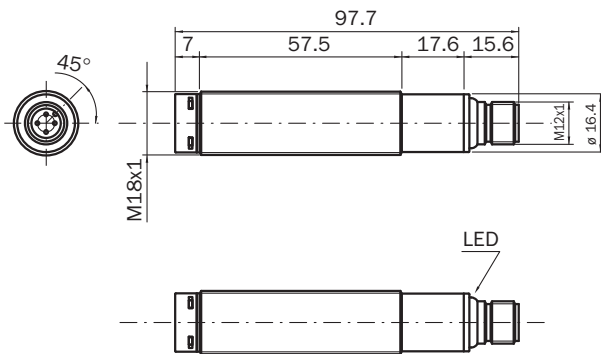
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Dimensional drawings

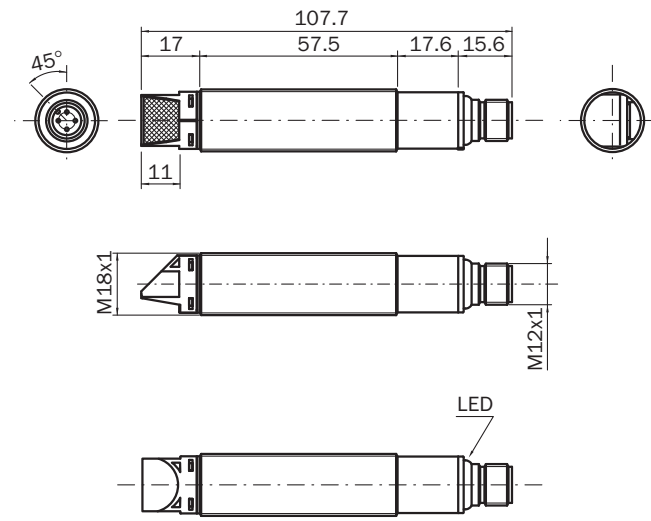
M30 axial



M18 axial



M18 radial



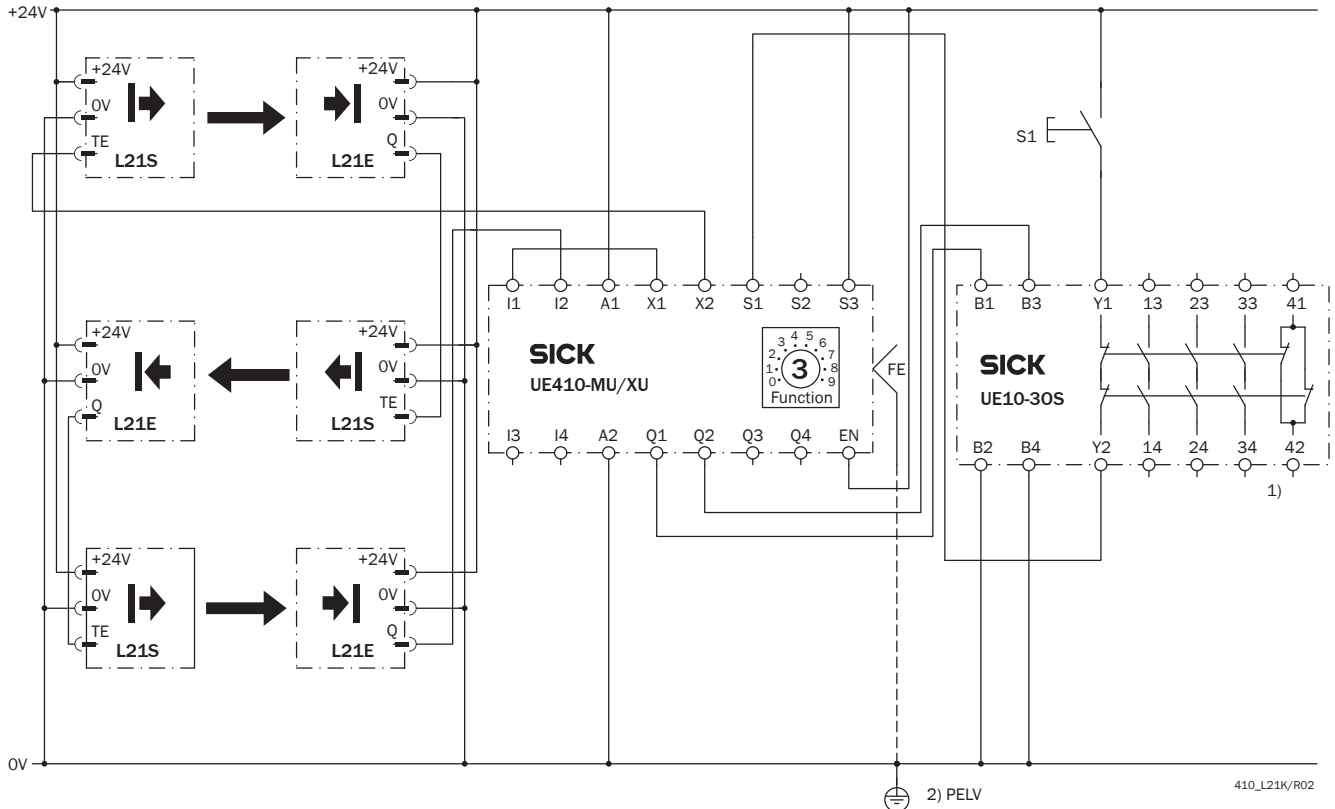
Dimensions in mm



Connection diagrams

→ You can find more connection diagrams at www.mysick.com

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

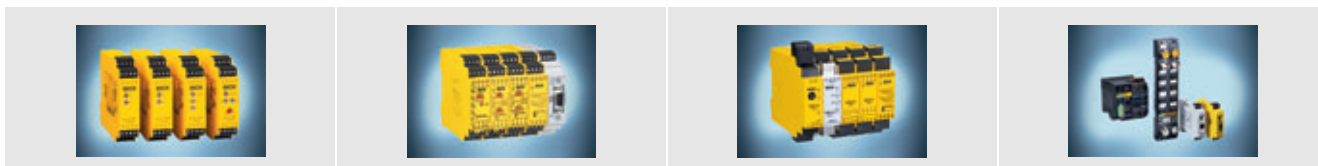
1) Output circuits: These contacts are to be connected to the controller such that, with the output circuit open, the dangerous state is disabled. For categories 4 and 3, the integration must be dual-channel (x/y paths). Single-channel integration in the control (z path) is only possible with a single-channel 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.

H

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



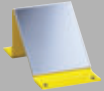
Mounting systems

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	
5 m	PUR halogen free	DOL-1204-W05MC		6025904			
	10 m	PVC	DOL-1204-W10M	6010541			

Deflector mirrors ¹⁾

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

¹⁾ 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 (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) ¹⁾
Performance level	PL c (EN ISO 13849) ¹⁾

¹⁾ 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

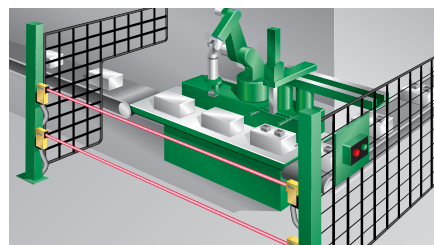
→ You can find more applications using the application finder at www.mysick.com

- 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



Further information	Page
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→ Dimensional drawings	H-31
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→ Accessories	H-33
→ Systematic safety	A-0
→ Services	B-0

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

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 _A)	100.000 h (+25 °C)	-
Protection class	II	
Enclosure rating	IP 67	
Safety related parameters		
Type	Type 2 (EN 61496) ¹⁾	
Safety integrity level	SIL1 (IEC 61508), SILCL1 (IEC 62061) ¹⁾	
Category	Category 2 (EN ISO 13849) ¹⁾	
Test rate (external test)	100/s (EN ISO 13849) ²⁾	
Maximum demand rate	60/min (EN ISO 13849) ³⁾	
Performance level	PL c (EN ISO 13849) ¹⁾	
PFHd (mean probability of a dangerous failure per hour)	1.0 x 10 ⁻⁶ (EN ISO 13849) ¹⁾	
T _M (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	

¹⁾ Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

²⁾ The test rate shall not be exceeded

³⁾ Between two demands on a safety-related response of the device, at least 100 internal or external tests must be carried out.



Electrical data

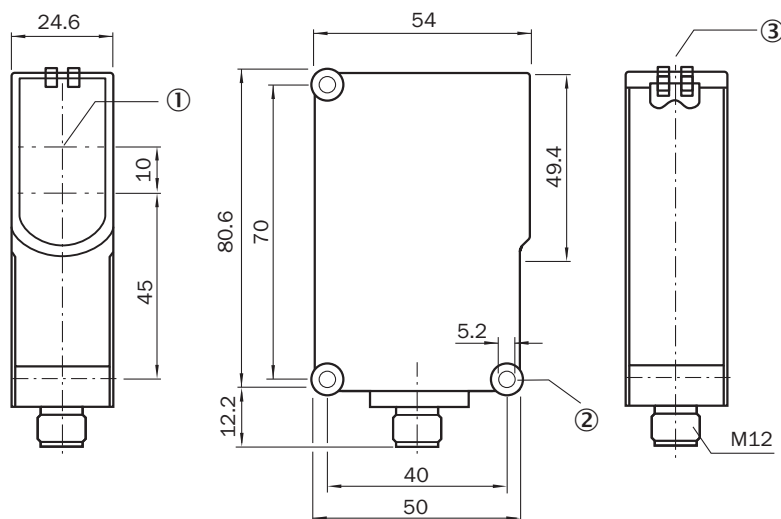
System part	Sender	Receiver
Connection type	Plug M12 x 4	
Supply voltage V_s	24 V DC (16.8 V DC ... 28.8 V DC) ¹⁾	
Maximum power consumption	35 mA	25 mA
Test input voltage	V_s (sender on) 0 V DC (sender off)	-
Test duration	2.6 ms ²⁾	-
Switching outputs	-	PNP, Q and \bar{Q} ³⁾
Maximum response time	-	540 μ s
Maximum switching sequence	-	1000 Hz
Maximum switching current	-	100 mA
Diagnostic display	LED	

¹⁾ Reverse polarity protected

²⁾ Signal propagation time for resistive load, for test signal application (sender) and output signal reaction (receiver)

³⁾ Short-circuit protected, interference suppression

Dimensional drawings



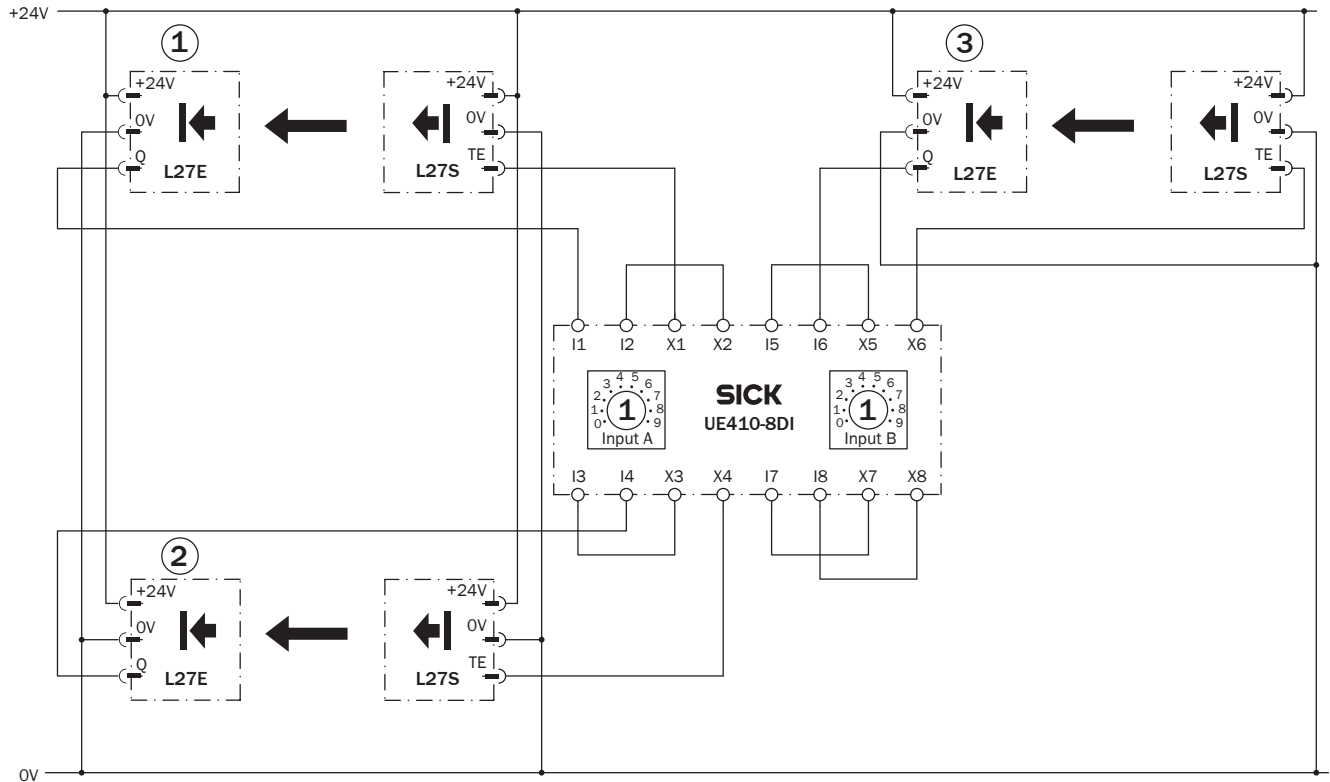
Dimensions in mm

H

Connection diagrams

→ You can find more connection diagrams at www.mysick.com

3 x L27 with a Flexi Classic UE410-8DI input expansion unit



H

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

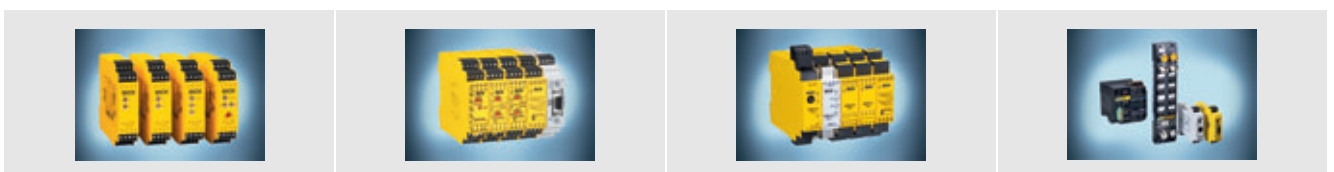
A UE410-8DI has two test pulse generators. This means that short-circuits between odd (X1) and evenly (X2) numbered outputs will be detected. Short-circuits between two odd (i.e., X1 and X3) or two evenly (i.e., X2 and X4) numbered outputs will not be detected. In this case, short-circuits between X1 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	
					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 ¹⁾

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

¹⁾ 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) ¹⁾
Performance level	PL c (EN ISO 13849) ¹⁾

¹⁾ 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

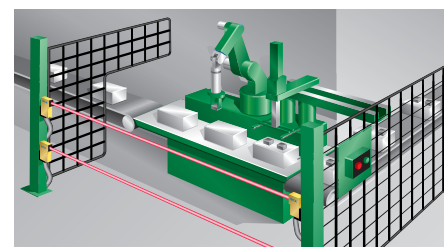
→ You can find more applications using the application finder at www.mysick.com

- Processing machines
- Machining centers
- Palletizer systems
- High-bay warehouses
- Transfer lines

Further information	Page
→ Dimensional drawings	H-36
→ Connection diagrams	H-37
→ Accessories	H-38
→ Systematic safety	A-0
→ Services	B-0



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

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 _A)	100.000 h (+25 °C)	-
Protection class	II	
Enclosure rating	IP 67	
Safety related parameters	Type 2 (EN 61496) ¹⁾ Safety integrity level SIL1 (IEC 61508), SILCL1 (IEC 62061) ¹⁾ Category 2 (EN ISO 13849) ¹⁾ Test rate (external test) 100/s (EN ISO 13849) ²⁾ Maximum demand rate 60/min (EN ISO 13849) ³⁾ Performance level PL c (EN ISO 13849) ¹⁾ PFHd (mean probability of a dangerous failure per hour) 1.0 x 10 ⁻⁶ (EN ISO 13849) ¹⁾ T _M (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	

¹⁾ Only in conjunction with suitable testing device, e.g., Flexi Classic, DeviceNet Safety

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Electrical data

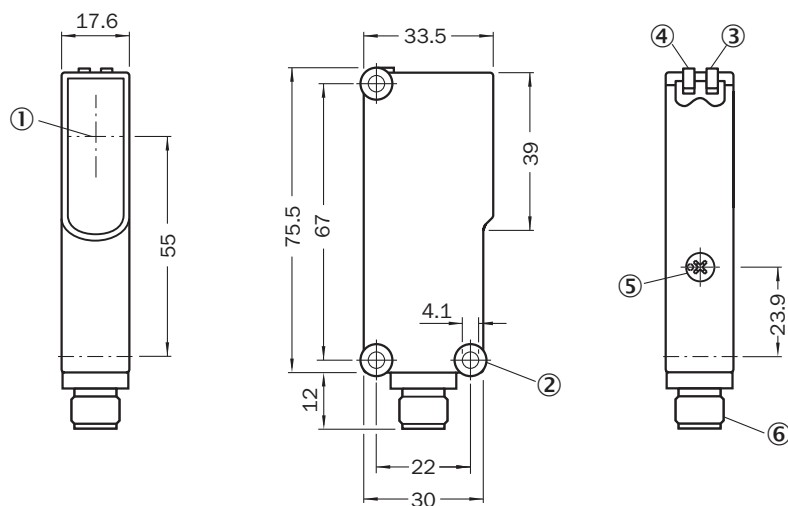
System part	Sender	Receiver
Connection type	Plug M12 x 4	
Supply voltage V_s	24 V DC (16.8 V DC ... 28.8 V DC) ¹⁾	
Maximum power consumption	35 mA	25 mA
Test input voltage	V_s (sender on) 0 V DC (sender off)	-
Test duration	2 ms ²⁾	-
Switching outputs	-	PNP, Q and \bar{Q} ³⁾
Maximum response time	-	500 μ s
Maximum switching sequence	-	1000 Hz
Maximum switching current	-	100 mA
Diagnostic display	LED	

¹⁾ Reverse polarity protected

²⁾ Signal propagation time for resistive load, for test signal application (sender) and output signal reaction (receiver)

³⁾ Short-circuit protected, interference suppression

Dimensional drawings



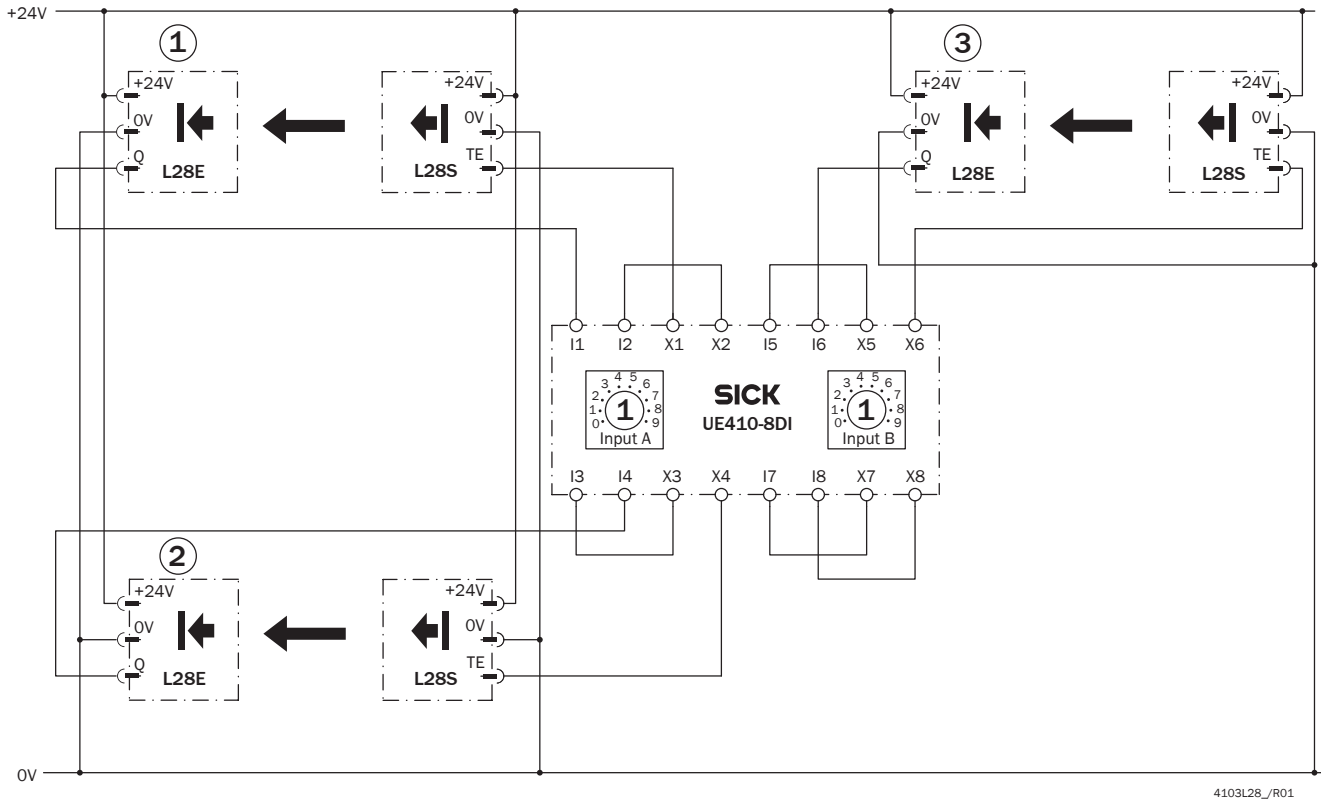
Dimensions in mm

H

Connection diagrams

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3 x L28 with a Flexi Classic UE410-8DI input expansion unit



Task

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Possible faults

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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



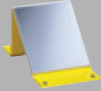
Property	Description	Type	Part no.
Mounting bracket	For L28	BEF-WN-W18	2009317
Spring fastening	For PSK1	BEF-4AAAAHST3	2012473
Fixing bracket	For PSK1	BEF-4GHAAHAL1	2009292

Connectors

Figure	Connection type	Designation	Direction of cable outlet	Cable length	Cable material	Type	Part no.		
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			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

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Deflector mirrors ¹⁾

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

¹⁾ Reduction of the scanning range