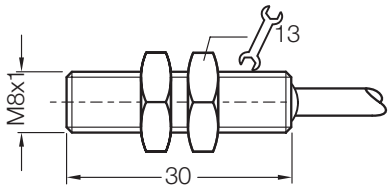
Inductive proximity sensors

IM 08 series, sensing range 1 mm
NAMUR, metal housing

Dimensions in mm



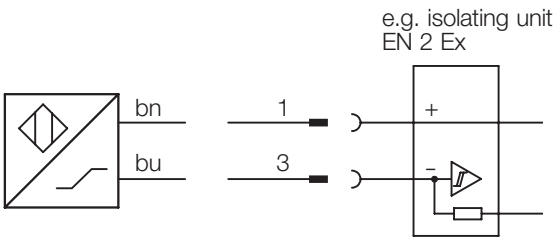
Features

- Can be installed flush in metal
- NAMUR to EN 50227
- High switching frequency
- Robust brass housing, nickel-plated, with fine thread M8 x 1 mm
- Enclosure rating IP 67
- **Classification**
  PTB 03 ATEX 2037
  Ⓔx II 2G EEx ia IIC T6

Accessories

Isolating unit EN2Ex

Connection diagram



Wire colour			Assignment
bn	braun	brown	+ V DC
bu	blau	blue	- V DC

Electrical and mechanical data

Operating voltage U_b	5 ... 25 V DC	**Enclosure rating** to EN 60529	IP 67
Nominal voltage U_n	8.2 V DC	**Shock and vibration stress**	30 g, 11 ms 10 to 55 Hz, 1 mm
Power consumption, attenuated	≤ 1.0 mA	**Ambient temperature** T_a	- 25 ... + 70 °C
Power consumption, unattenuated	≥ 2.2 mA	**Housing material**	Brass, nickel-plated, plastic
Internal capacitance	≤ 80 nF	**Tightening torque**	2.5 Nm
Internal inductance	≤ 110 µH	**Connection cable**	PVC, 2 x 0.14 mm^2, blue
Cable resistance	≤ 50 Ω		
Temperature drift	± 10% of s_r		
EMC	to EN 60 947-5-2		

Max. data for connecting Isolating unit EN 2 EX or other approved isolating amplifier:

Short circuit current I_K max.	50 mA
No load voltage U_O	15 V
Power loss Pmax.	180 mW

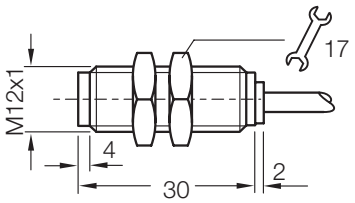
Selection table

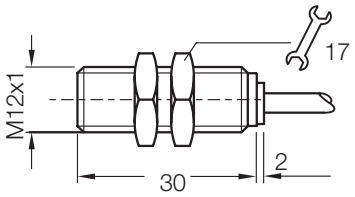
Sensing range s_n mm	Installation in metal	Version	Output function	Switching frequency f in Hz	Connection	Type	Order number
1		NAMUR		2000	Cable 2 m	IM08-01B-N-ZW0	6021123

Inductive proximity sensors

IM 12 series, sensing range 2 / 4 mm NAMUR, metal housing

Dimensions in mm





Features

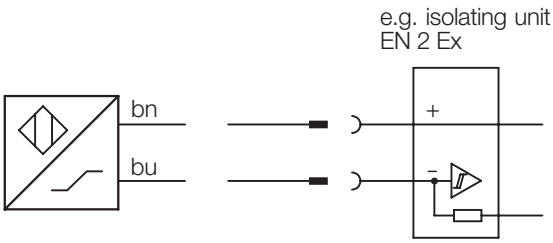
- Can be installed flush or non-flush in metal
- NAMUR to EN 50227
- High switching frequency
- Robust brass housing, nickel-plated, with fine thread M12 x 1 mm
- Enclosure rating IP 67
- **Classification**
  PTB 03 ATEX 2037
  Ex II 2 G EEx ia IIC T6

Accessories

Isolating unit EN2Ex

Mounting bracket

Connection diagram



Wire colour			Assignment
bn	braun	brown	+ V DC
bu	blau	blue	- V DC

Electrical and mechanical data

Operating voltage U_b	5 ... 25 V DC	**Short-circuit protected**	yes
Rated voltage U_n	8.2 V DC	**Reverse polarity protected**	yes
Power consumption, attenuated	≤ 1.0 mA	**Enclosure rating** to EN 60529	IP 67
Power consumption, unattenuated	≥ 2.2 mA	**Shock and vibration stress**	30 g, 11 ms 10 to 55 Hz, 1 mm
Internal capacitance	≤ 230 nF	**Ambient temperature** T_a	- 25 ... + 70 °C
Internal inductance	≤ 380 µH	**Housing material**	Brass, nickel-plated, plastic
Cable resistance	≤ 50 Ω	**Tightening torque**	7.0 Nm
Temperature drift	± 10% of s_r	**Connection cable**	PVC, 2 x 0.34 mm², blue
EMC	to EN 60 947-5-2		

Max. data for connecting Isolating unit EN 2 EX or other approved isolating amplifier:

Short circuit current I_K max.	50 mA
No load voltage U_O	15 V
Power loss Pmax.	180 mW

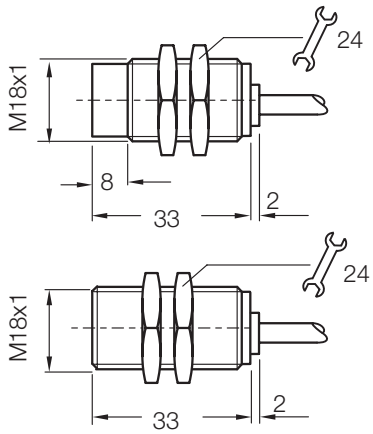
Selection table

Sensing range s_n mm	Installation in metal	Version	Output function	Switching frequency f in Hz	Connection	Type	Order number
2		NAMUR		1200	Cable 2 m	IM12-02B-N-ZW0	6021124
4		NAMUR		1500	Cable 2 m	IM12-04N-N-ZW0	6021125

Inductive proximity sensors

IM 18 series, sensing range 5 / 8 mm NAMUR, metal housing

Dimensions in mm



Features

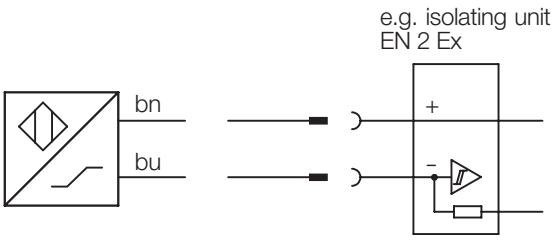
- Can be installed flush or non-flush in metal
- NAMUR to EN 50227
- High switching frequency
- Robust brass housing, nickel-plated, with fine thread M18 x 1 mm
- Enclosure rating IP 67
- **Classification**
  PTB 03 ATEX 2037
  Ex **II 2 G EEx ia IIC T6**

Accessories

Isolating unit EN2Ex

Mounting bracket

Connection diagram



Wire colour			Assignment
bn	braun	brown	+ V DC
bu	blau	blue	- V DC

Electrical and mechanical data

Operating voltage U_b	5 ... 25 V DC
Rated voltage U_n	8.2 V DC
Power consumption, attenuated	≤ 1.0 mA
Power consumption, unattenuated	≥ 2.2 mA
Internal capacitance	≤ 230 nF (flush) ≤ 240 nF (non-flush)
Internal inductance	≤ 60 µH
Cable resistance	≤ 50 Ω
Temperature drift	± 10% of s_r
EMC	to EN 60 947-5-2
Short-circuit protected	yes
Reverse polarity protected	yes
Enclosure rating to EN 60529	IP 67
Shock and vibration stress	30 g, 11 ms 10 to 55 Hz, 1 mm
Ambient temperature T_a	- 25 ... + 70 °C
Housing material	Brass, nickel-plated, plastic
Tightening torque	35 Nm
Connection cable	PVC, 2 x 0.34 mm^2, blue

Max. data for connecting Isolating unit EN 2 EX or other approved isolating amplifier:

Short circuit current I_K max.	50 mA
No load voltage U_O	15 V
Power loss Pmax.	180 mW

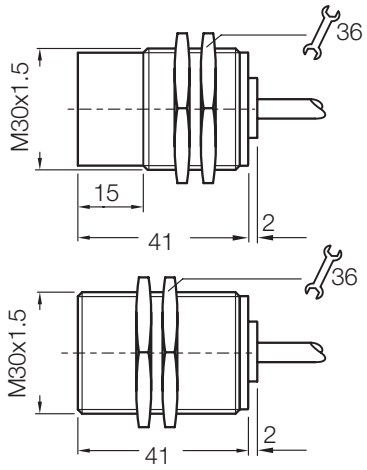
Selection table

Sensing range s_n mm	Installation in metal	Version	Output function	Switching frequency f in Hz	Connection	Type	Order number
5		NAMUR		720	Cable 2 m	IM18-05B-N-ZW0	6021126
8		NAMUR		300	Cable 2 m	IM18-08N-N-ZW0	6021127

Inductive proximity sensors

IM 30 series, sensing range 10 / 15 mm NAMUR, metal housing

Dimensions in mm



Features

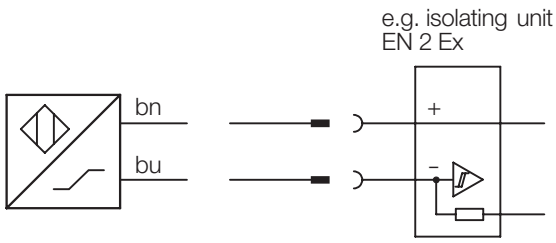
- Can be installed flush or non-flush in metal
- NAMUR to EN 50227
- High switching frequency
- Robust brass housing, nickel-plated, with fine thread M30 x 1.5 mm
- Enclosure rating IP 67
- **Classification**
  PTB 03 ATEX 2037
  Ex **II 2 G EEx ia IIC T6**

Accessories

Isolating unit EN2Ex

Mounting bracket

Connection diagram



Wire colour			Assignment
bn	braun	brown	+ V DC
bu	blau	blue	- V DC

Electrical and mechanical data

Operating voltage U_b	5 ... 25 V DC	**Short-circuit protected**	yes
Rated voltage U_n	8.2 V DC	**Reverse polarity protected**	yes
Power consumption, attenuated	≤ 1.0 mA	**Enclosure rating** to EN 60529	IP 67
Power consumption, unattenuated	≥ 2.2 mA	**Shock and vibration stress**	30 g, 11 ms 10 to 55 Hz, 1 mm
Internal capacitance	≤ 230 nF (flush) ≤ 240 nF (non-flush)	**Ambient temperature** T_a	- 25 ... + 70 °C
Internal inductance	≤ 130 µH (flush) ≤ 100 µH (non-flush)	**Housing material**	Brass, nickel-plated, plastic
Cable resistance	≤ 50 Ω	**Tightening torque**	50 Nm
Temperature drift	± 10% of s_r	**Connection cable**	PVC, 2 x 0.5 mm^2, blue
EMC	to EN 60 947-5-2		

Max. data for connecting isolating unit EN 2 EX or other approved isolating amplifier:

Short circuit current I_K max.	50 mA
No load voltage U_O	15 V
Power loss Pmax.	180 mW

Selection table

Sensing range s_n mm	Installation in metal	Version	Output function	Switching frequency f in Hz	Connection	Type	Order number
10		NAMUR		450	Cable 2 m	IM30-10B-N-ZW0	6021128
15		NAMUR		200	Cable 2 m	IM30-15N-N-ZW0	6021129

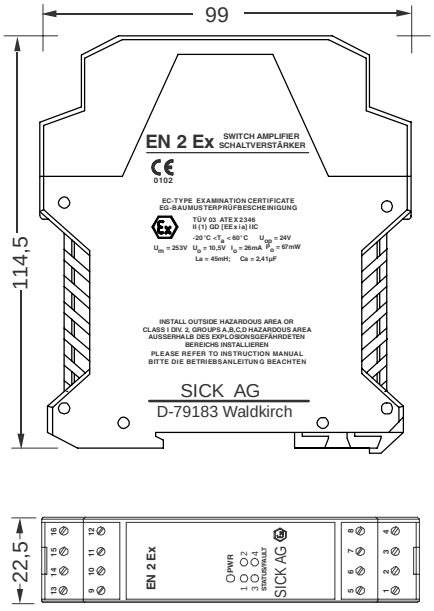
EN 2 Ex

Trennschaltverstärker
Relais Ausgang
Switch Amplifier
Relay Output

SICK AG
Industrial Sensors
Schiess-Strasse 56
D - 40549 Düsseldorf
Germany
+49 211 5301-0
Fax: +49 211 5301-00
www.sick.de

0227005 / 01 2004

Betriebsanleitung
Operating Instruction



Sicherheitshinweise

- Kennzeichnung: Ex II (1) GD [EEx ia] II C
- Vor der Inbetriebnahme die Betriebsanleitung lesen.
- Anschluss, Montage und Einstellung nur durch Fachpersonal in Anlehnung an die nationalen/internationalen Standards (z.B. VDE 0165) gefolgt von etablierten Installationsregeln.
- Die eigensicheren Kreise müssen klar getrennt und von anderen getrennt verlegt werden.
- Führt der eigensichere Stromkreis in staubexplosionsgefährdete Bereiche der Zone 20 bzw. 21, ist sicherzustellen, dass an diesen Stromkreis angeschlossene Geräte die Anforderungen für Kategorie 1D bzw. 2D erfüllen und entsprechend zertifiziert sind.
- Die auf dem Gerät angegebene Temperaturklasse, die Explosionsgruppe sowie die besonderen Bedingungen sind zu beachten.
- Prüfen Sie bei der Sicherheitsbetrachtung dass die zulässigen Werte der angeschlossenen Geräte (Ua, Ia, Pa) grösser sind als die Sicherheitsparameter des Betriebsmittels (Uo, Io, Po).
- Achten Sie darauf, dass die angeschlossenen Kabel keine grösseren Kapazitäten und Induktivitäten aufweisen (Co, Lo, L/R) als die eigensicheren Parameter des Betriebsmittels.
- Kein Sicherheitsbauteil gemäss EU-Maschinenrichtlinie

Bestimmungsgemässe Verwendung

- Richtlinienkonformität Explosionsschutz: Richtlinie 94/9/EG
- Das Gerät darf nicht in explosionsgefährdeten Bereichen eingesetzt bzw. eingebaut werden.
- Das Gerät dient als Schnittstelle zwischen elektrischen Signalen aus dem explosionsgefährdeten Bereich (Ex-Bereich) und dem nicht explosionsgefährdeten Bereich (Nicht-Ex-Bereich).
- Veränderungen am Gerät dürfen nicht vorgenommen werden.

Betrieb

Die Eingangssignale von NAMUR-Initiatoren, mechanischen Kontakten oder Optokopplern werden Relais Schaltkontakte in den sicheren Bereich übertragen. Eingangs-, Ausgangs- und Hilfsenergiekreis sind sicher galvanisch getrennt. Betriebsbereitschaft und Ausgangsstatus als auch Fühler-/Leitungsüberwachung werden über LED's signalisiert (Power: grün, Status: gelb, Fehler: rot). Es gibt zwei unabhängige galvanisch getrennte Ein- und Ausgänge. Zwei Zustände können unabhängig für jeden Kanal über frontseitige Schalter eingestellt werden:
Eingang offen > Ausgang schaltet oder Eingang geschlossen > Ausgang schaltet
Leitungsüberwachung ist aktiviert (Ausschalten: Brücke zwischen 5-6 kanal 1 und 1-2 Kanal 2)
Anmerkung: Soll ein Eingangskontakt mit LFD beaufschlagt werden, ist ein Serienwiderstand von 2,7 kΩ, sowie ein Parallelwiderstand von 10 kΩ am Kontakt erforderlich.

Funktionstabelle

	Eingang	Wirkrichtung	Leitungs-überwachung	Ausgang	gelbe LED (Schaltzustand)	rote LED (Leitungs-überwachung)
ohne Störung	offen	normal	beliebig	aus	aus	aus
	geschlossen	normal	beliebig	ein	ein	aus
	offen	invers	beliebig	ein	ein	aus
	geschlossen	invers	beliebig	aus	aus	aus
mit Störung	Leitungsfehler Kurzschluss / Bruch	beliebig	ein	aus	aus	ein
	Leitungsbruch	normal	aus	aus	aus	aus
	Leitungsbruch	invers	aus	ein	ein	aus
	Kurzschluss	normal	aus	ein	ein	aus
	Kurzschluss	invers	aus	aus	aus	aus

Installation

Das Gerät befindet sich in einem Kunststoffgehäuse geeignet zur Montage auf DIN-Schienen nach EN60715. Der elektrische Anschluss über steckbare Klemmen eignet sich für Anschlussquerschnitte 0,2 bis 2,5 mm². Die Klemmenblöcke können im Betrieb gezogen oder gesteckt werden, ohne Schaden hervorzurufen. Das Anschlussbild befindet sich im Datenblatt und auf der Gehäuseseite. Z.B.:
Hilfsenergie an "13 +" und an "15 -"
Ausgang Kanal 1 Common an "14", NC an "10", NO an "9"
Ausgang Kanal 2 Common an "16", NC an "12", NO an "11"
Näherungsschalter oder spg. freier Kontakt: Kanal 1: "5+" und "7-"; Kanal 2: "1+" und "3-"
Eigensichere Anschlüsse müssen gekennzeichnet und getrennt von nicht eigensicheren verlegt sein entsprechend nationalen und internationalen Installationsstandards. Stellen Sie sicher, dass die Anschlüsse von einander isoliert sind und keine unbeabsichtigten Verbindungen erzeugen. Die Gehäuse besitzen einen mechanischen Mindestschutz IP20 zur Montage innerhalb von Gebäuden. Die Geräte sind gegen Schmutz, Staub, extremen mechanischen und thermischen Stress zu schützen.

Inbetriebnahme

Prüfen Sie vor Anlegen der Hilfsenergie, dass alle Anschlussdrähte ordentlich angeschlossen sind, besonders Hilfsenergie und Polarität, sowie Eingangs- und Ausgangsanschlüsse. Prüfen Sie ebenso die eigensicheren Anschlüsse und dass deren Kabel von anderen getrennt verlegt sind. Die Kabel müssen gekennzeichnet sein, vorzugsweise blau oder durch Markierung.
Legen Sie Hilfsenergie an, die "Power On" - LED muss leuchten. Status- und Fehler-LED muss mit der entsprechenden Eingangsleitung übereinstimmen. Wenn möglich schliessen und öffnen Sie die Eingänge und prüfen die entsprechenden LED's (Status und Fehler).

Safety Information

- Category: Ex II (1) GD [EEx ia] II C
- Before setting up read the manual.
- Installation, Mounting and Maintenance only by qualified personal in accordance to the national/international standards (e.g. VDE 0165) following the established installation rules.
- I.S. conductors must be segregated from non I.S. ones.
- If I.S. circuit is passed through zone 20 or 21 hazardous areas, be sure that devices connected to this circuit fulfil category's 1D or 2D requirements and that they are certified respectivly.
- The max. operating temperature, the explosion group as well as special conditions are to be observed.
- In the system analysis check that parameters of connected field devices (Ua, Ia, Pa) are not exceeded the limits (Co, Lo, L/R) given in the Associated Apparatus parameters.
- Check that added connecting cable's capacitance and inductance do not exceed the limits (Co, Lo, L/R) given in the Associated Aparatus parameters.
- No relevant safety component acc. to the EC Machinery Directive

Intended Purpose

- Conformity Explosion Protection acc. to Directive 94/9/EC
- Not to be located and used in Hazardous Area.
- The device is used as an interface for electrical signals coming from Hazardous and non Hazardous Area.
- Any modification of the device may not be made.

Operation

The unit accepts as an input from Hazardous Area a proximity sensor or voltage free electrical contact and repeats their status to Safe Area by relay contacts. Presence of supply power and status of output (energized or de-energized), as well as integrity or fault condition of sensor and connecting line are displayed by signalling LEDs (green for power, yellow for status and red for fault condition).The apparatus has two independent input channels and actuates the corresponding output transistor; two actuation modes can be independently front switch configured for each input channel:
NO input > NE relay or NO input > ND relay
Contact or proximity sensor and its connection line, short or open circuit fault detection is enabled. Fault detection can be disabled (jumper between terminal 5-6 channel 1 and 1-2 channel 2)
Note: use of voltage free electrical contacts with line fault detection enabled requires at the switch end of the line a 2,7 kΩ series connected resistor and a 10 kΩ parallel connected resistor.

Device operation - Truth table

	Input	Working direction	Line monitoring	Output	Yellow LED output status	Red LED line monitor
Line O.K.	Initiator attenuated open contact	normal	Independent of output operation	deener-gized	off	off
	Initiator unattenuated contact closed	normal		ener-gized	on	off
	Initiator attenuated open contact	reverse		ener-gized	on	off
	Initiator unattenuated contact closed	reverse		deener-gized	off	off
Line fault	Line fault	don't care	on	deener-gized	off	on
	Line open	normal	off	deener-gized	off	off
	Line open	reverse	off	ener-gized	on	off
	Short circuit	normal	off	ener-gized	on	off
	Short circuit	reverse	off	deener-gized	off	off

Installation

The device is a switch/proximity detector repeater housed in a plastic enclosure suitable for installation on T35 DIN Rail according to EN60715. Electrical connection of conductors from 0.2 to 2.5 mm² are accomodated by polarized plug-in removable srew terminal blocks which can be plugged in/out into a powered unit without suffering or causing any damage. On the data sheet and enclosure side a block diagram identifies all connections and configurations .
Connect power supply at terminal "13 +" and at "15 -".
Connect relay 1: Common at "14", NC at "10" , NO at "9"
Connect relay 2: Common at "16" , NC at "12", NO at "11"
Connect proximity sensor or voltage free contact at "5+" and "7-" for channel 1, connect at "1+" and "3-" for channel 2
Intrinsically safe conductors must be identified and segregated from non I.S. and wired in accordance to the relevant national or international installation standards. The enclosure provides an IP20 minimum degree of mechanical protection for indoor installation. Consistent with the effective operating environment of the specific installation, units must be protected against dirt, dust, extreme mechanical and thermal stress and causal contacts.

Start-Up

Before powering the unit check all wires are properly connected, particulary supply conductors and their polarity, input and output wires, also check that Intrinsically Safe conductors and cable trays are segregated and identified either by color coding, preferable blue, or by marking.
Turn on power, the „Power On" LED must be lit, status and fault LED on each channel must be in accordance with condition of corresponding input line. If possible close and open input lines one at time checking the corresponding status and fault LED's condition as well as output to be correct.

Technische Daten

Hilfsenergie:

24V DC (20 bis 30V) verpolungssicher, max. 0,7 W
230 / 120 V AC, 2,2 VA / Kanal

Galvanische Trennung

Eingang/Ausgang 1,5 kV; Eingang/Versorgung 1,5 kV; Ausgang / Ausgang: 500 V; Ausgang/Versorgung 500 V

Eingangspegel:

EIN >1,75 mA, AUS < 1,55 mA
(Leerlaufspannung 8,5 V, Kurzschlussstrom 8,5 mA)

Ausgang

Potentialfreie Umschaltkontakte
Belastung: 250V, 5 A, 100 VA / 100 V, 2 A, 50 W
Schaltfrequenz: 20Hz max.

Elektromagnetische Verträglichkeit:

CE-Zeichen, nach EN 61326

Umgebungsbedingungen:

Betrieb: -20 bis +60°C, rel. Feuchte max. 75% keine Betauung, bis 35°C
Lagerung: -25 bis +80°C

Sicherheitstechnische Werte:

Ex II (1) G D [EEx ia] IIC zugehöriges elektrisches Betriebsmittel
Uo = 10,5 V, Io = 26mA, Po = 67 mW an Anschluss 1,2, 3; 5, 6, 7
Um = 253 V rms, -20°C ≤ Ta ≤ 60°C
EG-Baumusterprüfbescheinigung: TÜV 03 ATEX 2346 entsprechend EN50014, EN50020
Montage: T35 DIN Schiene nach EN 60715
Gewicht: ca. 175 g
Anschlüsse: Schraub-Steck-Klemmblöcke, bis 2,5 mm²
Montageort: im Nicht Ex Bereich / Sicherer Bereich
Schutzart: IP20
Abmessungen: Breite 22,5mm, Tiefe 99mm, Höhe 114,5mm

Parameter Tabelle			
Sicherheitswerte	Maximale externe Parameter		
	Gruppe	Co (µF)	Lo (mH)
Anschluss 1, 2, 3 u. 5, 6, 7			
Uo = 10,5 V	IIC	2,41	45
Io = 26 mA	IIB	16,80	160
Po = 67 mW			

Technical Data

Supply:

24 V nom. (20 to 30 V) reverse polarity protected, max. 0,7 W
230 / 120 V AC, 2.2 VA / channel

Isolation (Test Voltage):

I.S. in/Out 1,5 kV; I.S. In/Supply 1.5 kV;
Out /Out: 1.5 kV; Out/Supply 500 V

Input switching current levels:

ON > 1.75 mA, OFF < 1.55 mA
(No load operation voltage 8.5 V, Short current 8.5 mA)

Output:

Voltage free SPST contacts
Contact rating: 250 V, 5 A, 100 VA / 100 V, 2 A, 50 W
Frequency response: 20 Hz max.

Electromagnetic compatibility:

CE mark compliant, conforms to EN61326

Environmental conditions:

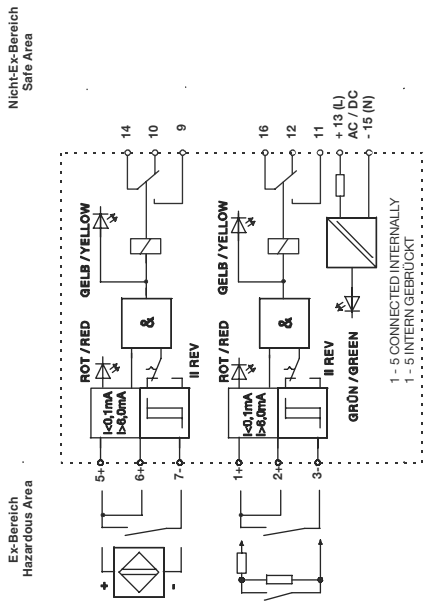
Operating: Temperature limits -20 to +60°C, relative humidity max. 75% non condensing, up to 35°C
Storage: Temperature limits -25 to + 80°C

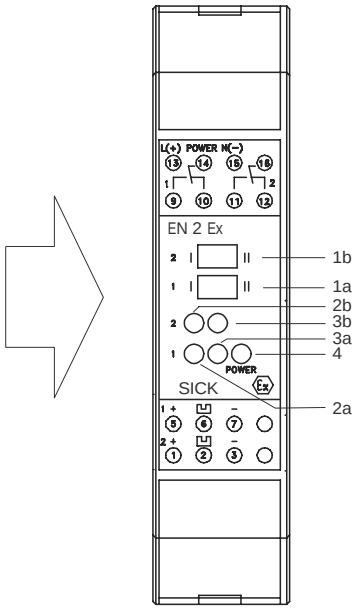
Safety Description:

Ex II (1) GD [EEx ia] IIC associated electrical app.
Voc = 10.5 V; Isc = 26mA; Po = 67 mW at terminals: 1,2,3; 5, 6, 7
Um = 253 V rms, -20°C ≤ Ta ≤ 60°C
EC-Type Examination Certificate: TÜV 03 ATEX 2346 conforms to EN50014, EN50020
Mounting: T35 DIN Rail according to EN60715
Weight: ~ 175 g
Connection: By polarized plug-in disconnect scew terminal blocks; terminations up to 2.5 mm²
Location: Safe Area / Non Hazardous Locations
Protection class: IP20
Dimensions: Width 22.5 mm, Depth 99 mm, High 114.5 mm

Parameters Table			
Safety description	Maximum External Parameters		
	Group	Co (µF)	Lo (mH)
Terminals 1,2, 3; 5, 6, 7			
Voc = 10,5V	IIC	2,41	45
Isc = 26 mA	IIB	16,80	160
Po = 67 mW			

Anschlussplan / Functional Diagram





Beschreibung der Bedienelemente

1. Schalter zur Umkehr der Wirkungsrichtung:
   Schalter Stellung I: Kontakt geschlossen > Ausgang aktiv (EIN)
   Schalter Stellung II:Kontakt offen > Ausgang aktiv (EIN)
2. LED rot: Signalisierung Leitungsüberwachung (nur aktiv bei NAMUR Schalter bzw. mech. Kontakt mit Widerständen
3. LED gelb: Signalisierung Schaltzustand, wird parallel zum Ausgang angesteuert
4. LED grün: Hilfsenergie liegt an

a für Kanal 1
b für Kanal 2

Description of control elements

1. Switches for changing output direction.
   Switch in position I: If contact closed > output active (ON).
   Switch in position II: If contact open > output active (ON).
2. Red LED for input monitoring: Only working with NAMUR switch e.g. mechanical switches with current limiting network
3. Yellow LED: displays switch status (connected in parallel to the output)
4. Green LED: power 'ON' indication

a: Channel 1
b: Channel 2

Sur demande, notre Service Commercial vous enverra la Notice d'emploi en français.
As instruções de serviço em português podem ser requisitadas junto da empresa F. Fonseca SA. +351 234 303 900
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Sobre demanda, a través de nuestra organizaçion de ventas podrá obtener las instrucciones de servicio en español.
Käyttöohjeen suomen kielellä saat toivomuksesta myyntiorganisaatioltamme.
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SICK

EC Declaration of Conformity

In Compliance with the EC Directive ATEX 94/9/EC and EMC 89/336/EEC

We hereby declare that the devices (see page 2)

of the product family EN2EX.

comply with the basic requirements of the EC Directive specified under Point 1. If an item of equipment listed overleaf is modified without our approval then this declaration loses its validity for this equipment.

We employ a quality system certified by the DQS (German Quality Assurance Society), No. 462, quality system TÜV 02 ATEX 1845 Q as per ISO 9001 and have therefore observed the regulations in accordance with module H as well as the following EC directives and EN standards during development and production:

1. ***EC directives***	EC ATEX Directive 94/9/EC EC EMC Directive 89/336/EEC as per 92/31/EEC, 93/68/EEC, 93/465/EEC		
2. ***Harmonized standards used***	EN 50014	Electrical apparatus for potentially explosive atmospheres - general requirements	Ed. 92-12
	EN 50020	Electrical apparatus for potentially explosive atmospheres – intrinsinc safety „i"	Ed. 94-08
	EN 61326, EN 61326/A1, EN 61326/A2	Electrical equipment for measurement, control and laboratory use	Ed. 97-04 Ed. 98-06 Ed. 01-05
3. ***Test Result***	Ex II (1) GD (EEx ia) IIC		

The conformance of a type examplation belonging to the above-mentioned product family with the regulations from the listed EC-directive 94/9/EG has been certified by:

Address of notified body		TÜV NORD CERT GmbH & Co. KG Am TÜV 1 D-30519 Hannover
No. of notified body	:	03
EC-type-examplation-No.	:	2346

Conformance of a type examplation belonging to the above-mentioned product family with the regulations from the listed EC directives has been certified by:

Waldkirch/Br., 30/07-04

ppa. Schröder (Business Unit Manager Division Industrial Standard Sensors)

ppa. Hertweck (Manager Production Division Industrial Standard Sensors)

The declaration certifies conformance with the listed directives, but does not guarantee product characteristics. The safety instructions contained in the product documentation must be observed.

Mat. No.: 9 089 170
Page 3
Update no. see page 2

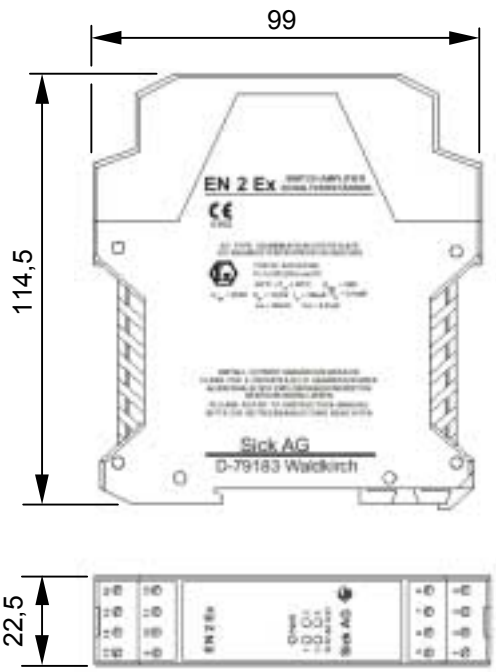
SICK AG • Sebastian-Kneipp-Straße 1 • D-79183 Waldkirch • Telefon 0 76 81-2 02-0 • Telefax 0 76 81-2 02-38 63 • www.sick.com
Aufsichtsrat: Gisela Sick (Ehrenvorsitzende) • Volker Reiche (Vorsitzender)
Vorstand: Anne-Kathrin Deutlich (Sprecherin) • Dr. Robert Bauer • Jens Hörhne
Sitz: Waldkirch i. Br. • Handelsregister: Emmendingen HRB 355 W

Switching amplifier

EN 2 Ex

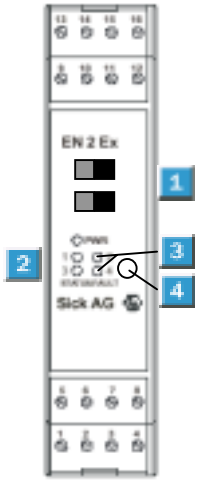
- **Marking:**
  II (1) G / D [EEx ia] IIC according to Directive 94/9/EC (ATEX) with intrinsically safe inputs
- **Reliable electrical isolation between input, output, and supply voltage to VDE 0100 Part 410**
- **2-channel each with one relay output 1 x u**
- **Invertible outputs**
- **Mounting on 35 mm (1.378 in.) DIN rails according to DIN EN 60715**

Dimensional drawing



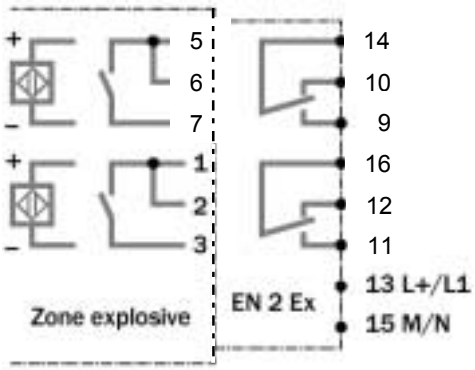
Adjustment possible

All types



1	Switches to reverse action. Switch in position I and contact in the input circuit closed, output active (ON) Switch in position II, output action inverted.
2	LED (red), cable monitoring indicator: The activation of the cable-break and cable short-circuit monitoring is only functional if a sensor/proximity switch to EN 60947-5-6 (NAMUR) or a mechanical contact with suitable resistance circuit as per the operating instructions is connected. This circuit monitors the input current and deactivates the output with input currents < 0.3 mA cable-break and > 6.5 mA short-circuit irrespective of setting for the direction of action.
3	LED (yellow), switch status indication This LED is activated in parallel to the output.
4	LED (green), supply voltage indication.

Connection diagram



TECHNICAL DESCRIPTION

Technical Data	EN 2 Ex	-1	-2	-3
Supply voltage V_S	120 V AC			
	230 V AC			
	24 V DC			
Power frequency	48...62 Hz			
Power consumption per channel	Approx. 2.2 VA			
Power consumption, total	Approx. 0.7 W			
Inputs	For 1 or 2 sensors			
No-load voltage	8.5 V DC			
EC-type examination certificate	TÜV 03 ATEX 2346			
Output voltage $U_{O,}$ max.	10.5 V			
Output current $I_{O,}$ max.	26 mA			
Output power $P_{O,}$ max.	67 mW			
External capacity $C_{a,}$ max.	2,41 µF			
External inductivity $L_{a,}$ max.	45 mH			
Ambient temperature T_A	Operation: – 20 °C ≤ T_a ≤ + 60 °C			
Switching points	0: OFF < 1.55 mA			
	1: ON > 1.75 mA			
Short circuit current	I ≥ 8.5 mA			
Switching outputs [1]	1 relay per input: SPDT			
Switching voltage $U_{max.}$	250 V AC			
Switching current $I_{max.}$	5 A			
Switching power $P_{max.}$	100 VA			
VDE protection class	I			
Enclosure rating	IP 20			
Ambient temperature T_A	Storage: – 25 °C ... + 85 °C			
Weight	Approx. 175 g			
Housing material	Plastic			

[1] Provide suitable spark suppression for inductive or capacitive loads

Transmission characteristic	
Active direction	
Direction of action	reversible (see table)
Cable monitoring	Can be switched off
Max. switching frequency	20 Hz

Order information	
Type	**Part No.**
EN 2 EX-1	6 010 459
EN 2 EX-2	6 010 460
EN 2 EX-3	6 009 944

Table of switching functions

Input		Active direction light/dark change-over switch on		Cable monitoring		Output status	
		I	II		Red LED	Relay	Yellow LED
No fault in input circuit	Contact open	Normal		as desired	off	dropped off	off
			Inverted	as desired	off	responded	on
	Contact closed	Normal		as desired	off	responded	on
			Inverted	as desired	off	dropped off	off
With fault in input circuit	Cable break	Normal		on	on	dropped off	off
			Inverted	on	on	dropped off	off
	Short-circuit	Normal		on	on	dropped off	off
			Inverted	on	on	dropped off	off
	Cable break	Normal		off	off	dropped off	off
			Inverted	off	off	responded	on
	Short-circuit	Normal		off	off	responded	on
			Inverted	off	off	dropped off	off