

# Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP - 2865984

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2-channel Ex-i NAMUR isolation amplifier with wide-range power supply for proximity sensors and switches. Every channel has a relay with PDT contact as a signal output. Line fault detection (LFD), 3-way isolation, SIL 2.

## Your advantages

- ✓ Up to SIL 2 according to EN 61508
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ Line fault detection (LFD), can be activated/deactivated, error indicated by red flashing LED with de-excitation of output relay
- ✓ Relay signal output (PDT)
- ✓ 3-way electrical isolation
- ✓ LED indicators for supply voltage, switching state, and malfunction according to NAMUR NE 44
- ✓ Direction of operation can be selected (operating or closed circuit current behavior)
- ✓ Wide-range power supply of 19.2 ... 253 V AC/DC
- ✓ 2-channel
- ✓ Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia] IIC



## Key Commercial Data

Packing unit	1 pc
GTIN	
GTIN	4046356462532

## Technical data

### Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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### Dimensions

Width	17.5 mm
Height	99 mm

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## Technical data

### Dimensions

Depth	114.5 mm
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### Ambient conditions

Ambient temperature (operation)	-20 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Degree of protection	IP20
Noise immunity	EN 61000-6-2

### Input data

Non-load voltage	~ 8 V DC
Switching points (attenuated)	< 1.2 mA (blocking)
Switching points (unattenuated)	> 2.1 mA (conductive)
Signal input	Intrinsically safe
Available input sources	NAMUR proximity sensors (EN 60947-5-6)
Short-circuit current	~ 8 mA
Switching hysteresis	< 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA
	Short circuit 100 Ω < RSensor < 360 Ω

### Output data

Switching output	Relay output
Contact type	1 PDT per channel
Contact material	AgSnO <sub>2</sub> , hard gold-plated
Maximum switching voltage	250 V AC (2 A, 60 Hz)
	120 V DC (0.2 A)
	30 V DC (2 A)
Maximum switching capacity	500 VA
Mechanical service life	10 <sup>7</sup> cycles
Switching frequency	≤ 20 Hz (Load-dependent)

### Power supply

Supply voltage range	24 V ... 230 V AC/DC (-20 % ... +10 %, 50 Hz ... 60 Hz)
Max. current consumption	< 80 mA
Power dissipation	≤ 1.3 W
Power consumption	≤ 1.3 W

### Connection data

Connection method	Screw connection
Stripping length	7 mm
Conductor cross section solid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

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### Connection data

Conductor cross section AWG	24 ... 14
Torque	0.5 Nm ... 0.6 Nm

### General

No. of channels	2
Step response (10-90%)	typ. 6 ms (N/O contact: OFF/ON)
	typ. 6 ms (N/O contact: ON/OFF)
	typ. 4 ms (N/C contact: ON/OFF)
	typ. 10 ms (N/C contact: OFF/ON)
Status display	Green LED (supply voltage, PWR)
	LED yellow (switching state)
	Red LED (line errors)
Flammability rating according to UL 94	V0
Degree of pollution	2
Overvoltage category	III
Electromagnetic compatibility	Conformance with EMC directive
Interference emission	EN 61000-6-4
Housing material	PA 6.6-FR
Color	gray
Designation	Input/output
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Designation	Input/power supply
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
	300 V <sub>rms</sub> (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
	2.5 kV AC (50 Hz, 1 min., test voltage)
Designation	Output 1/output 2/input, power supply
Electrical isolation	300 V <sub>rms</sub> (Rated insulation voltage (overvoltage category III; degree of pollution 2, safe isolation as per EN 61010-1))
	2.5 kV (50 Hz, 1 min., test voltage)
Conformance	CE-compliant, additionally EN 61326
ATEX	# II (1) G [Ex ia Ga] IIC
	# II (1) D [Ex ia Da] IIIC
	# II 3(1) G Ex nA nC [ia Ga] IIC T4 Gc X
IECEX	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA nC [ia Ga] IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
SIL	2

### Safety characteristic data

Safety Integrity Level (SIL)	1
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## Technical data

### Safety characteristic data

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### Safety data

Max. internal inductance $L_i$	negligible
Max. internal capacitance $C_i$	11 nF
Max. output voltage $U_o$	9.56 V
Max. output current $I_o$	10.3 mA
Max. output power $P_o$	25 mW
Group	IIC
Max. external inductivity $L_o$	300 mH
Max. external capacity $C_o$	3.6 $\mu$ F
Group	IIB/IIIC
Max. external inductivity $L_o$	1000 mH
Max. external capacity $C_o$	26 $\mu$ F
Safety-related maximum voltage $U_m$	253 V AC/DC (Supply terminals)

### EMC data

Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
Evaluation criterion	A
Designation	Fast transients (burst)
Standards/regulations	EN 61000-4-4
Evaluation criterion	A
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Evaluation criterion	A

### Standards and Regulations

Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4
Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
Evaluation criterion	A
Standards/regulations	EN 61000-4-4
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Evaluation criterion	A
Flammability rating according to UL 94	V0
Conformance	CE-compliant, additionally EN 61326
ATEX	# II (1) G [Ex ia Ga] IIC
	# II (1) D [Ex ia Da] IIIC
	# II 3(1) G Ex nA nC [ia Ga] IIC T4 Gc X

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## Technical data

### Standards and Regulations

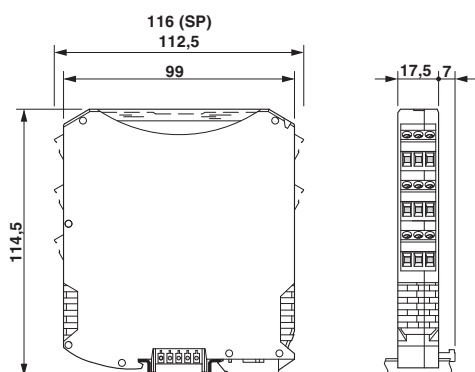
IECEEx	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA nC [ia Ga] IIC T4 Gc
UL, USA/Canada	Class I Div 2; IS for Class I, II, III Div 1
DNV GL-Temperature	B
DNV GL-Humidity	B
DNV GL-Vibration	A
DNV GL-EMC	A
DNV GL-Enclosure	Required protection according to the Rules shall be provided upon installation on board
Group	IIC
	IIB/IIIC

### Environmental Product Compliance

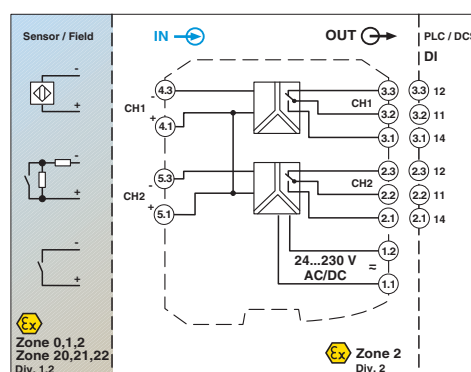
China RoHS	Environmentally Friendly Use Period = 50
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

## Drawings

Dimensional drawing

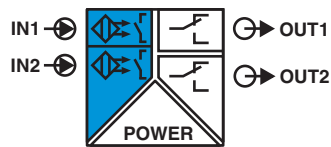


Block diagram

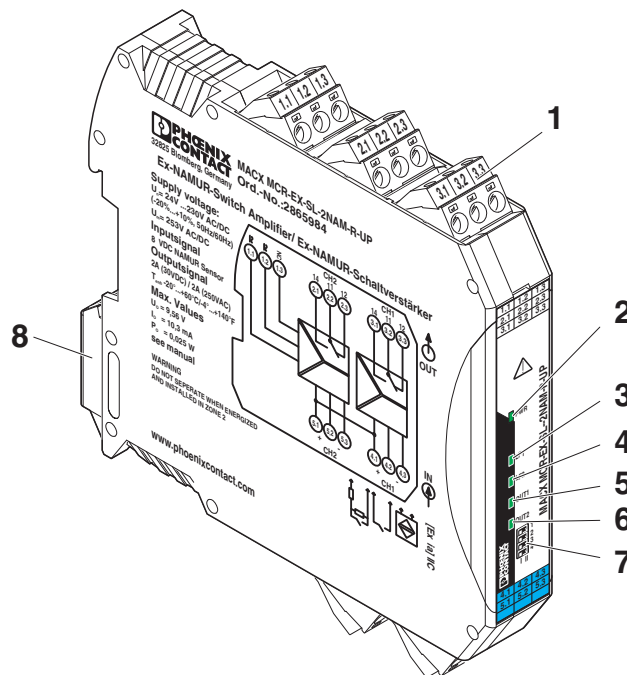


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Pictogram



Schematic diagram



Approvals

Approvals

Approvals

UL Listed / cUL Listed / Functional Safety / DNV GL / cULus Listed

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## Approvals

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Ex Approvals

IECEX / ATEX / UL Listed / cUL Listed / EAC Ex / cULus Listed

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### Approval details

UL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 330267
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cUL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 330267
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Functional Safety			09/12-02 R010 V1R0
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DNV GL		<a href="https://approvalfinder.dnvgl.com/">https://approvalfinder.dnvgl.com/</a>	TAA000020C
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cULus Listed			
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