

# MACX MCR-SL-NAM-2RO - Isolation amplifier



2865010

<https://www.phoenixcontact.com/us/products/2865010>

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NAMUR signal conditioner for operating proximity sensors and switches. The signals are transferred to the control level using 2 isolated relay outputs (N/O contact). Line fault detection (LFD), 3-way electrical isolation, SIL 2, screw connection.

## Your advantages

- Power supply and error indication possible via DIN rail connector
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- Up to SIL 2 in accordance with EN 61508
- Line fault detection (LFD), can be activated/deactivated, error indicated by flashing red LED with de-excitation of output relay
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- 4-way electrical isolation
- Direction of operation can be selected (operating or closed circuit current behavior)
- 2 relay signal outputs (N/O contact); output 2 can also be used as an error signaling output
- LED indicators for supply voltage, switching state, and malfunction in accordance with NAMUR NE 44

## Commercial data

Item number	2865010
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C402
Product key	CK1141
Catalog page	Page 135 (C-5-2019)
GTIN	4046356491686
Weight per piece (including packing)	181 g
Weight per piece (excluding packing)	140 g
Customs tariff number	85365019
Country of origin	DE

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## Technical data

### Product properties

Product type	Isolating switch transf.
Product family	MACX Analog
Application	Digital IN
No. of channels	1
Type	Signal conditioners with SIL functional safety
Configuration	DIP switches

### System properties

#### Functionality

Configuration	DIP switches
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### Electrical properties

Electrical isolation	3-way isolation
Electrical isolation between input and output	yes

#### Electrical isolation Input/supply, DIN rail connector IEC/EN 61010-1

Standards/regulations	IEC/EN 61010-1
Rated insulation voltage	300 V <sub>rms</sub>
Overvoltage category	II
Pollution degree	2
Insulation	Safe isolation

#### Electrical isolation Output 1/output 2/input, power supply, DIN rail connector IEC/EN 61010-1

Standards/regulations	IEC/EN 61010-1
Rated insulation voltage	300 V <sub>rms</sub>
Overvoltage category	III
Pollution degree	2
Insulation	Safe isolation

#### Electrical isolation Output 1/output 2/input/power supply, DIN rail connector

Test voltage	2.5 kV AC (50 Hz, 60 s)
Overvoltage category	III
Pollution degree	2

#### Supply

Nominal supply voltage	24 V DC -20 % ... +25 %
Supply voltage range	19.2 V DC ... 30 V DC
Max. current consumption	30 mA (24 V DC)
Power dissipation	< 950 mW
Power consumption	< 950 mW

### Input data

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Signal: NAMUR

Number of inputs	1
Available input sources	NAMUR proximity sensors (IEC/EN 60947-5-6)
	Floating switch contacts
	Switch contacts with resistance circuit
Switching threshold "0" signal current	< 1.2 mA (blocking)
Switching threshold "1" signal, current	> 2.1 mA (conductive)
Short-circuit current	8 mA
Switching hysteresis	< 0.2 mA
Line fault detection	< 0.05 mA ... 0.35 mA (Line break)
	< 100 Ω ... 360 Ω (Short circuit)
	Activated /deactivated via DIP switch
Non-load voltage	8 V DC

## Output data

Switching: Relay

Contact switching type	2 N/O contacts
Contact material	AgSnO <sub>2</sub> , hard gold-plated
Maximum switching voltage	250 V AC (2 A)
	120 V DC (0.2 A)
	30 V DC (2 A)
Maximum switching capacity	500 VA
Recommended minimum load	5 V / 10 mA
Switching frequency	≤ 20 Hz (without load)

Signal

Number of outputs	2
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## Connection data

Connection method	Screw connection
Stripping length	7 mm
Screw thread	M3
Conductor cross section rigid	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>
Conductor cross section AWG	24 ... 14
Tightening torque	0.5 Nm ... 0.6 Nm

Test socket

Max. diameter	2 mm
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## Ex data

Ex installation (EPL)	Gc
	Div. 2

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## Interfaces

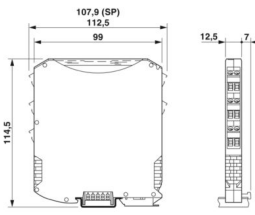
### Data

No. of channels	0
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## Signaling

Status display	Green LED (supply voltage)
	LED yellow (switching state)
	Red LED (line errors)

## Dimensions

Dimensional drawing	
Width	12.5 mm
Height	112.5 mm
Depth	113.7 mm
Depth NS 35/7,5	114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715)

## Material specifications

Color	gray (RAL 7042)
Flammability rating according to UL 94	V0 (Housing)
Housing material	PA 6.6-FR

## Characteristics

### Safety data

Safety Integrity Level (SIL)	2
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### Safety data: IEC 61508 - Low demand

Safety Integrity Level (SIL)	2
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### Safety data: IEC 61508 - Low demand

Safety Integrity Level (SIL)	2
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## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20 (not assessed by UL)
Ambient temperature (operation)	-40 °C ... 60 °C (Any mounting position)
	-40 °C ... 70 °C (Derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °C

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Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	5 % ... 95 % (non-condensing)

## Altitude range (≤ 2000 m)

Altitude	≤ 2000 m (The technical data refers to altitudes ≤2000 m above mean sea level. For altitudes >2000 m above mean sea level, refer to the data sheet.)
Ambient temperature (operation)	-40 °C ... 60 °C
	-40 °C ... 70 °C (Derating)
Rated insulation voltage	253 V AC (Power supply, input / output)
	125 V DC (Power supply, input / output)

## Altitude range (≤ 3000 m)

Height range	> 2000 m ... 3000 m
Ambient temperature (operation)	-40 °C ... 54 °C
	-40 °C ... 63 °C (Derating)
Rated insulation voltage	190 V AC (Power supply, input / output)
	110 V DC (Power supply, input / output)

## Altitude range (≤ 4000 m)

Height range	> 3000 m ... 4000 m
Ambient temperature (operation)	-40 °C ... 48 °C
	-40 °C ... 56 °C (Derating)
Rated insulation voltage	60 V AC/DC (Power supply, input / output)

## Altitude range (≤ 5000 m)

Height range	> 4000 m ... 5000 m
Ambient temperature (operation)	-40 °C ... 42 °C
	-40 °C ... 49 °C (Derating)
Rated insulation voltage	60 V AC/DC (Power supply, input / output)

## Approvals

### CE

Certificate	CE-compliant
Note	and EN 61326-1

### ATEX

Identification	Ⓜ II 3G Ex ec nC IIC T4 Gc
Certificate	IBExU 07 ATEX 1069 X

### UKCA Ex (UKEX)

Identification	Ⓜ II 3G Ex ec nC IIC T4 Gc
Certificate	PxCIF21UKEX2865049X

### IECEX

Identification	Ex ec nC IIC T4 Gc
Certificate	IBE 08.0001 X

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## CCC / China-Ex

Identification	Ex ec nC IIC T4 Gc
Certificate	2021122304114179

## UL, USA/Canada

Identification	UL 508 Listed
	UL 61010 Listed
	Class I, Div. 2, Groups A, B, C, D T4
	Class I, Zone 2, Group IIC T4

## Shipbuilding approval

Certificate	DNV GL TAA00000AG
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## Safety Integrity Level (SIL, IEC 61508)

Identification	2
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## INMETRO

Identification	Ex ec nC IIC T4 Gc
Certificate	DNV 18.0114 X

## EAC Ex

Identification	Ex ec nC IIC T4 Gc
Certificate	BY/112 02.01 TP012 103.01 00078

## DNV GL data

Temperature	B
Humidity	B
Vibration	A
EMC	B
Enclosure	Required protection according to the Rules shall be provided upon installation on board

## EMC data

Noise immunity	EN 61000-6-2
	EN 61326
Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4

## Standards and regulations

Electrical isolation	3-way isolation
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## GB Standard

Standards/regulations	GB/T 3836.1
	GB/T 3836.3
	GB/T 3836.8

## Mounting

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Mounting type	DIN rail mounting
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## Classifications

### ECLASS

ECLASS-11.0	27210121
ECLASS-12.0	27210121
ECLASS-13.0	27210121

### ETIM

ETIM 9.0	EC001485
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### UNSPSC

UNSPSC 21.0	39121000
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## Environmental product compliance

China RoHS	Environmentally Friendly Use Period = 50 years For information on hazardous substances, refer to the manufacturer's declaration available under "Downloads"
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