# MACX MCR-SL-NAM-R - NAMUR isolation switch amplifier

2865997

https://www.phoenixcontact.com/us/products/2865997

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NAMUR signal conditioners for operating proximity sensors and switches. The signals are transmitted to the control level via relay output (changeover contact). Line fault detection (LFD), 3-way electrical isolation, SIL 2, with 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
- LED indicators for supply voltage, switching state, and malfunction in accordance with NAMUR NE 44
- 3-way electrical isolation
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- Signal output relay (changeover contact)
- Direction of operation can be selected (operating or closed circuit current behavior)

## Commercial data

| | |
|---|---|
| Item number | 2865997 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | C402 |
| Product key | DK1113 |
| GTIN | 4046356466981 |
| Weight per piece (including packing) | 178.4 g |
| Weight per piece (excluding packing) | 134.1 g |
| Customs tariff number | 85365019 |
| Country of origin | DE |

# Technical data

## Product properties

| | |
|---|---|
| Product type | Isolating switch amplifier |
| Product family | MACX Analog |
| Application | Digital IN |
| No. of channels | 1 |
| Configuration | DIP switches |

## System properties

### Functionality

| | |
|---|---|
| Configuration | DIP switches |

## Electrical properties

| | |
|---|---|
| Electrical isolation | 3-way isolation |
| Electrical isolation between input and output | yes |
| Maximum power dissipation for nominal condition | < 650 mW |

### Electrical isolation

| | |
|---|---|
| Test voltage | 2.5 kV AC (50 Hz, 60 s) |

### Electrical isolation Input/output IEC/EN 60079-11

| | |
|---|---|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 375 $V_{PP}$ |
| Overvoltage category | II |
| Pollution degree | 2 |

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

| | |
|---|---|
| Standards/regulations | IEC/EN 61010-1 |
| Rated insulation voltage | 300 $V_{rms}$ |
| Overvoltage category | II |
| Pollution degree | 2 |
| Insulation | Safe isolation |

### Electrical isolation Output/input, supply, TBUS IEC/EN 61010-1

| | |
|---|---|
| Standards/regulations | IEC/EN 61010-1 |
| Rated insulation voltage | 300 $V_{rms}$ |
| Overvoltage category | III |
| Pollution degree | 2 |
| Insulation | Safe isolation |

### Electrical isolation Input/supply, DIN rail connector IEC/EN 60079-11

| | |
|---|---|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 375 $V_{PP}$ |
| Overvoltage category | II |

| | |
|---|---|
| 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 | 21 mA (24 V DC) |
| Power dissipation | < 650 mW |
| Power consumption | < 650 mW |

## Input data

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 |
| Open-circuit voltage | 8 V DC |

## Output data

Switching: Relay

| | |
|---|---|
| Contact switching type | 1 changeover contact |
| Contact material | $AgSnO_2$, hard gold-plated |
| Maximum switching voltage | 250 V AC (2 A) |
| | 120 V DC (0.2 A) |
| | 30 V DC (2 A) |
| Maximum switching power | 500 VA |
| Recommended minimum load | 5 V / 10 mA |
| Switching frequency | ≤ 20 Hz (without load) |

Signal

| | |
|---|---|
| Number of outputs | 1 |

## Connection data

| | |
|---|---|
| Connection method | Screw connection |
| Stripping length | 7 mm |
| Screw thread | M3 |
| Conductor cross-section rigid | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |

| | |
|---|---|
| Conductor cross-section AWG | 24 ... 14 |
| Tightening torque | 0.5 Nm ... 0.6 Nm |

Test socket

| | |
|---|---|
| Max. diameter | 2 mm |

## Ex data

| | |
|---|---|
| Ex installation (EPL) | Gc |
| | Div. 2 |

## Interfaces

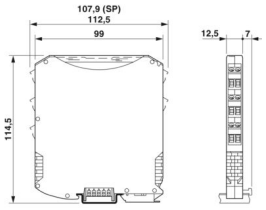
Data

| | |
|---|---|
| No. of channels | 0 |

## 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 (Housing) | V0 (Housing) |
| Housing material | PA 6.6-FR |

## Characteristics

Safety data

| | |
|---|---|
| Safety Integrity Level (SIL) | 2 |

Safety data: IEC 61508 - Low demand

| | |
|---|---|
| Safety Integrity Level (SIL) | 2 |

Safety data: IEC 61508 - Low demand

| | |
|---|---|
| Safety Integrity Level (SIL) | 2 |

## 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 |
| 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 | Ⓔx II 3G Ex ec nC IIC T4 Gc |

| | |
|---|---|
| Certificate | IBExU 07 ATEX 1069 X |

IECEx

| | |
|---|---|
| Identification | Ex ec nC IIC T4 Gc |
| Certificate | IBE 08.0001 X |

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 |

Safety Integrity Level (SIL, IEC 61508)

| | |
|---|---|
| Identification | 2 |
| Certificate | IN-AT-AS-MRL-24-00163 |

Systematic Capability

| | |
|---|---|
| Identification | 3 |

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 |

Shipbuilding 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

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

Noise emission

| | |
|---|---|
| Standards/regulations | EN 61000-6-4 |

## Standards and regulations

| | |
|---|---|
| Electrical isolation | 3-way isolation |

GB Standard

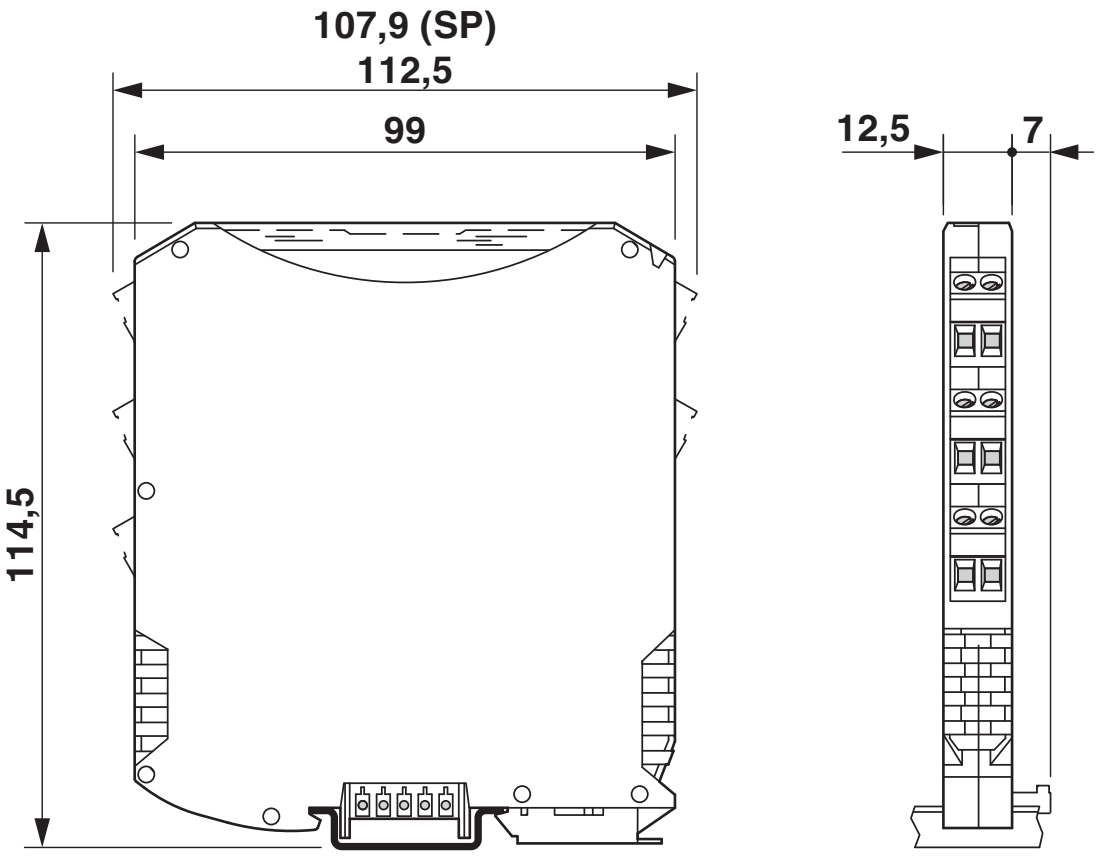
| | |
|---|---|
| Standards/regulations | GB/T 3836.1 |
| | GB/T 3836.3 |
| | GB/T 3836.8 |

## Mounting

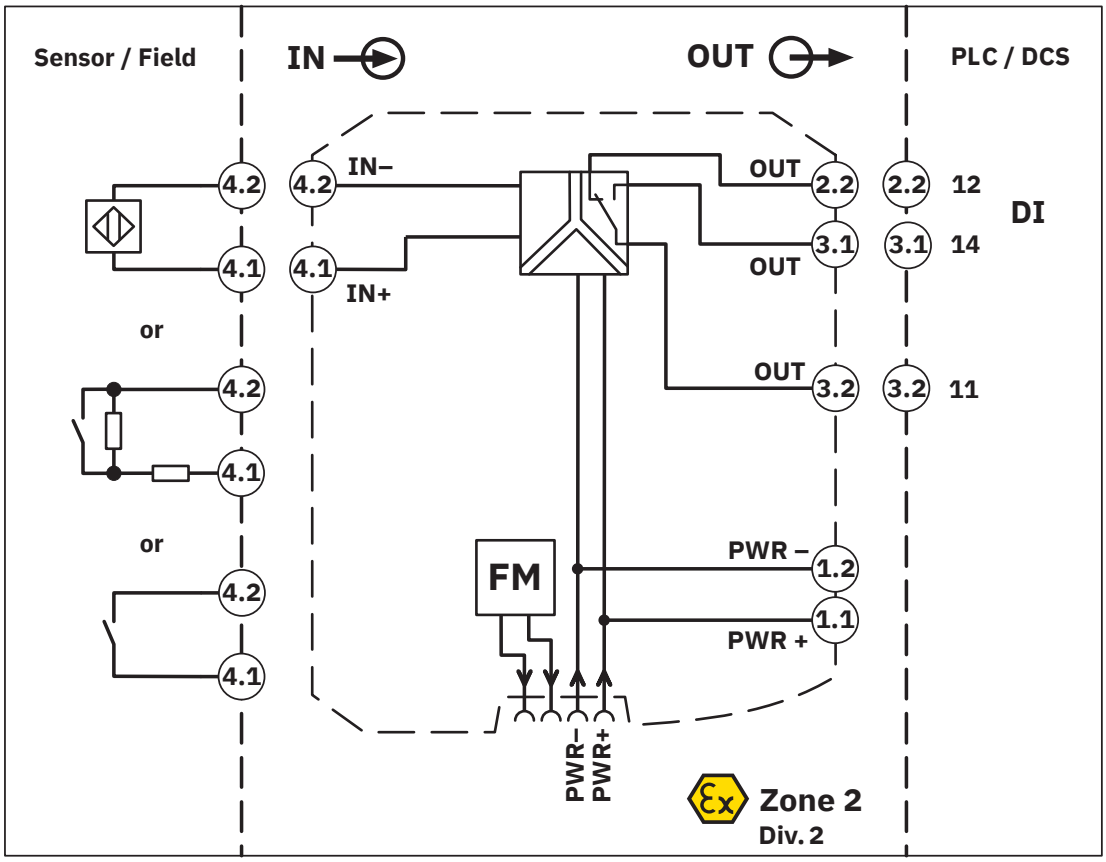
| | |
|---|---|
| Mounting type | DIN rail mounting |

## Drawings

Dimensional drawing



Block diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2865997

**UL Listed**
Approval ID: E330267

**cUL Listed**
Approval ID: E330267

**Functional Safety**
Approval ID: 07-06-39 R005 V2R2

**DNV**
Approval ID: TAA00000AG

**TUEV Austria FS**
Approval ID: IN-AT-AS-24-00163

**cULus Listed**
Approval ID: E330267

**DNV**
Approval ID: TAA000020C

**IECEx**
Approval ID: IECEx IBE 08.0001X

**cUL Listed**
Approval ID: E199827

**UL Listed**
Approval ID: FILE E 199827

**ATEX**
Approval ID: IBExU07ATEX1069

**INMETRO**
Approval ID: DNV 18.0114 X

**CCC**
Approval ID: 2021122304114179

**cULus Listed**
Approval ID: E199827

**CCC**
Approval ID: 2021122304114179

## Classifications

### ECLASS

| | |
|---|---|
| ECLASS-13.0 | 27210121 |
| ECLASS-15.0 | 27210121 |

### ETIM

| | |
|---|---|
| ETIM 10.0 | EC001485 |

### UNSPSC

| | |
|---|---|
| UNSPSC 21.0 | 39121000 |

## Environmental product compliance

EU RoHS

| | |
|---|---|
| Fulfills EU RoHS substance requirements | Yes |
| Exemption | 7(a), 7(a)-I, 7(c)-I |

China RoHS

| | |
|---|---|
| Environment friendly use period (EFUP) | EFUP-50 |
| | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

EU REACH SVHC

| | |
|---|---|
| REACH candidate substance (CAS No.) | Lead(CAS: 7439-92-1) |
| SCIP | 13c82efe-7c24-4666-a98c-252ff0324db3 |


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Phoenix Contact USA
586 Fulling Mill Road
Middletown, PA 17057, United States
(+717) 944-1300
info@phoenixcon.com