

MACX MCR-SL-NAM-R - 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 |

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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 |

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| | |
|------------------|---|
| 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 mm ² ... 2.5 mm ² |
| Conductor cross-section flexible | 0.2 mm ² ... 2.5 mm ² |

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| | |
|-----------------------------|-------------------|
| 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 | ⊕ II 3G Ex ec nC IIC T4 Gc |
|----------------|----------------------------|

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| | |
|-------------|----------------------|
| 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 |
|-----------------------|--------------|

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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 |
|---------------|-------------------|

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Drawings

Dimensional drawing



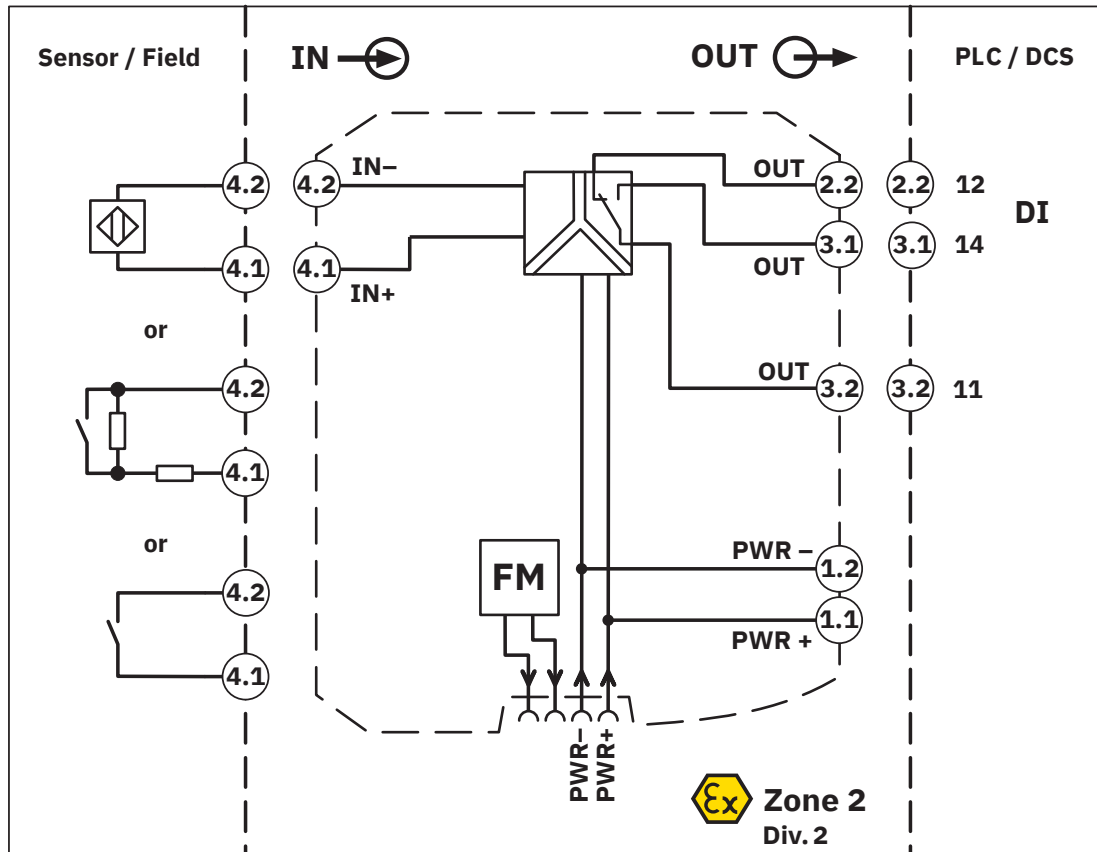
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Block diagram



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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


 **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

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Classifications

ECLASS

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

ETIM

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

UNSPSC

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

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Environmental product compliance

EU RoHS

| | |
|---|--------------|
| Fulfills EU RoHS substance requirements | Yes |
| Exemption | 7(a), 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) |
| | 2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol(CAS: 79-94-7) |
| SCIP | 13c82efe-7c24-4666-a98c-252ff0324db3 |

EF3.1 Climate Change

| | |
|---------|---------------|
| CO2e kg | 4.224 kg CO2e |
|---------|---------------|

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