

## Isolation amplifier - MACX MCR-SL-NAM-2RO-SP - 2924265

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NAMUR isolation amplifier for operating proximity sensors and switches. The signals are transferred to the control level using 2 separate relay outputs (N/O contacts). Line fault detection (LFD), galvanic 3-way isolation, SIL 2.

The illustration shows the versions with screw connection

### Product Features

- ✓ 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 according to EN 61508
- ✓ Line fault detection (LFD), can be activated/deactivated, error indicated by red flashing LED with de-excitation of output relay
- ✓ 4-way electrical isolation
- ✓ Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- ✓ LED indicators for supply voltage, switching state, and malfunction according to NAMUR NE 44
- ✓ 2 relay signal outputs (N/O contact); output 2 can also be used as an error signaling output
- ✓ Direction of operation can be selected (operating or closed circuit current behavior)



### Key commercial data

|                                      |           |
|--------------------------------------|-----------|
| Packing unit                         | 1 pc      |
| Weight per Piece (excluding packing) | 140.0 GRM |
| Custom tariff number                 | 85437090  |
| Country of origin                    | Germany   |

### Technical data

#### Note

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

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## Technical data

### Dimensions

|        |          |
|--------|----------|
| Width  | 12.5 mm  |
| Height | 99 mm    |
| Depth  | 114.5 mm |

### Ambient conditions

|                                         |                                          |
|-----------------------------------------|------------------------------------------|
| Ambient temperature (operation)         | -20 °C ... 60 °C (Any mounting position) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C                         |
| Maximum altitude                        | ≤ 2000 m                                 |
| Permissible humidity (operation)        | 10 % ... 95 % (non-condensing)           |
| Noise immunity                          | EN 61000-6-2                             |
| Degree of protection                    | IP20                                     |

### Input data

|                                 |                       |
|---------------------------------|-----------------------|
| Non-load voltage                | ~ 8 V DC              |
| Switching points (attenuated)   | < 1.2 mA (blocking)   |
| Switching points (unattenuated) | > 2.1 mA (conductive) |

### Output data

|                           |                                       |
|---------------------------|---------------------------------------|
| Switching output          | Relay output                          |
| Contact 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)                         |
| Max. switching power      | 500 VA                                |
| Mechanical service life   | 10 <sup>7</sup> cycles                |

### Power supply

|                          |                       |
|--------------------------|-----------------------|
| Nominal supply voltage   | 24 V DC               |
| Supply voltage range     | 19.2 V DC ... 30 V DC |
| Max. current consumption | 30 mA (24 V DC)       |
| Power consumption        | < 950 mW              |

### Connection data

|                                        |                     |
|----------------------------------------|---------------------|
| Conductor cross section solid min.     | 0.2 mm <sup>2</sup> |
| Conductor cross section solid max.     | 1.5 mm <sup>2</sup> |
| Conductor cross section stranded min.  | 0.2 mm <sup>2</sup> |
| Conductor cross section stranded max.  | 1.5 mm <sup>2</sup> |
| Conductor cross section AWG/kcmil min. | 24                  |
| Conductor cross section AWG/kcmil max  | 16                  |

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## Technical data

### Connection data

|                   |                        |
|-------------------|------------------------|
| Stripping length  | 8 mm                   |
| Connection method | Spring-cage connection |

### General

|                                         |                                                                                                                                    |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| No. of channels                         | 1                                                                                                                                  |
| Status display                          | Green LED (supply voltage)                                                                                                         |
|                                         | LED yellow (switching state)                                                                                                       |
|                                         | Red LED (line errors)                                                                                                              |
| Inflammability class according to UL 94 | V0                                                                                                                                 |
| Pollution degree                        | 2                                                                                                                                  |
| Surge voltage category                  | III                                                                                                                                |
| Housing material                        | PA 66-FR                                                                                                                           |
| Color                                   | green                                                                                                                              |
| Designation                             | Input/output/supply, DIN rail connector                                                                                            |
| Electrical isolation                    | 300 V <sub>rms</sub> (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1))  |
|                                         | 2.5 kV (50 Hz, 1 min., test voltage)                                                                                               |
| Designation                             | Input/supply, DIN rail connector                                                                                                   |
| Electrical isolation                    | 300 V <sub>rms</sub> (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1))  |
|                                         | 2.5 kV (50 Hz, 1 min., test voltage)                                                                                               |
| Designation                             | Output 1/output 2/input, power supply, T connector                                                                                 |
| Electrical isolation                    | 300 V <sub>rms</sub> (Rated insulation voltage (surge voltage category III; pollution degree 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 3 G Ex nA nC IIC T4 Gc X                                                                                                      |
| UL, USA / Canada                        | UL applied for                                                                                                                     |

### Safety characteristic data

|                              |                                 |
|------------------------------|---------------------------------|
| Integrity requirement        | IEC 61508 - Low demand          |
| Designation                  | Non-inverted operation          |
| Equipment type               | Type A                          |
| Safety Integrity Level (SIL) | Up to 2                         |
| Safe Failure Fraction (SFF)  | 78 %                            |
| $\lambda_{SU}$               | $2.49 \times 10^{-7}$ (249 FIT) |
| $\lambda_{SD}$               | $6 \times 10^{-9}$ (6 FIT)      |
| $\lambda_{DU}$               | $6.4 \times 10^{-8}$ (64 FIT)   |
| $\lambda_{DD}$               | $7 \times 10^{-9}$ (7 FIT)      |

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## Technical data

### Safety characteristic data

|                                                                    |                                              |
|--------------------------------------------------------------------|----------------------------------------------|
| Probability of a hazardous failure on demand (PFD <sub>AVG</sub> ) | 3.09 x 10 <sup>-4</sup> (1 year)             |
|                                                                    | 6.17 x 10 <sup>-4</sup> (2 years)            |
|                                                                    | 1.54 x 10 <sup>-3</sup> (5 years)            |
| Diagnostic coverage (DC)                                           | DC <sub>S</sub> = 2.4%, DC <sub>D</sub> = 9% |
| Integrity requirement                                              | IEC 61508 - Low demand                       |
| Designation                                                        | Inverted operation                           |
| Equipment type                                                     | Type A                                       |
| Safety Integrity Level (SIL)                                       | Up to 2                                      |
| Safe Failure Fraction (SFF)                                        | 78 %                                         |
| $\lambda_{SU}$                                                     | 2.48 x 10 <sup>-7</sup> (248 FIT)            |
| $\lambda_{SD}$                                                     | 1 x 10 <sup>-9</sup> (1 FIT)                 |
| $\lambda_{DU}$                                                     | 6.2 x 10 <sup>-8</sup> (62 FIT)              |
| $\lambda_{DD}$                                                     | 6 x 10 <sup>-9</sup> (6 FIT)                 |
| Probability of a hazardous failure on demand (PFD <sub>AVG</sub> ) | 3.01 x 10 <sup>-4</sup> (1 year)             |
|                                                                    | 6.02 x 10 <sup>-4</sup> (2 years)            |
|                                                                    | 1.5 x 10 <sup>-3</sup> (5 years)             |
| Diagnostic coverage (DC)                                           | DC <sub>S</sub> = 0.4%, DC <sub>D</sub> = 8% |

## Classifications

### eCl@ss

|            |          |
|------------|----------|
| eCl@ss 4.0 | 27210121 |
| eCl@ss 4.1 | 27210121 |
| eCl@ss 5.0 | 27210121 |
| eCl@ss 5.1 | 27210121 |
| eCl@ss 6.0 | 27210121 |
| eCl@ss 7.0 | 27210121 |
| eCl@ss 8.0 | 27210121 |

### ETIM

|          |          |
|----------|----------|
| ETIM 2.0 | EC001430 |
| ETIM 3.0 | EC001599 |
| ETIM 4.0 | EC002653 |
| ETIM 5.0 | EC002653 |

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### Classifications

#### UNSPSC

|               |          |
|---------------|----------|
| UNSPSC 6.01   | 30211506 |
| UNSPSC 7.0901 | 39121008 |
| UNSPSC 11     | 39121008 |
| UNSPSC 12.01  | 39121008 |
| UNSPSC 13.2   | 39121008 |

### Approvals

#### Approvals

##### Approvals

GL / Functional Safety

##### Ex Approvals

ATEX

Approvals submitted

#### Approval details

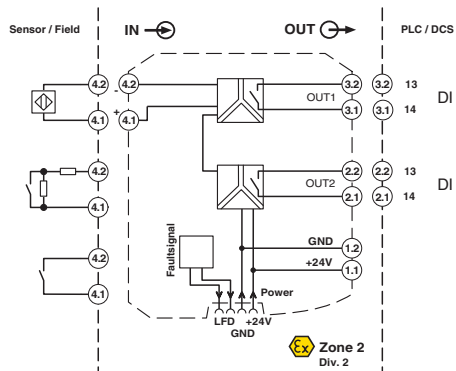
|    |
|----|
| GL |
|----|

|                   |
|-------------------|
| Functional Safety |
|-------------------|

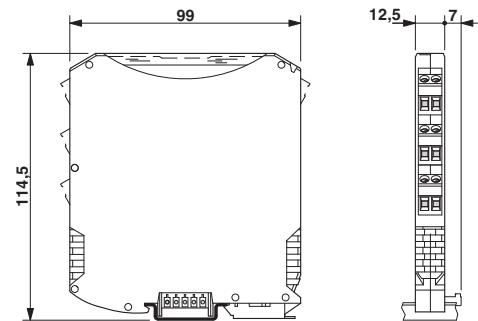
### Drawings

## Isolation amplifier - MACX MCR-SL-NAM-2RO-SP - 2924265

Block diagram



Dimensioned drawing





**Стандарт  
Электрон  
Связь**

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