

## Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

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NAMUR signal conditioner for operating proximity sensors and switches. The signals are transmitted to the control level via 2 transistor outputs (passive). Line fault detection, 3-way electrical isolation, SIL 2, Push-in 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 according to EN 61508
- ✓ Line fault detection (LFD), can be activated/deactivated, error indicated by red flashing LED with disabling of transistor output
- ✓ Signal output 2 can also be used as an error signaling output
- ✓ LED indicators for supply voltage, switching state, and malfunction according to NAMUR NE 44
- ✓ 2 transistor signal outputs (passive); up to 5 kHz
- ✓ 4-way electrical isolation
- ✓ Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- ✓ Direction of operation can be selected (operating or closed circuit current behavior)



### Key Commercial Data

|              |               |
|--------------|---------------|
| Packing unit | 1 pc          |
| GTIN         |               |
| GTIN         | 4046356492089 |

### Technical data

#### Note

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

#### Dimensions

|        |          |
|--------|----------|
| Width  | 12.5 mm  |
| Height | 116.9 mm |

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## Technical data

### Dimensions

|       |          |
|-------|----------|
| Depth | 113.7 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)           |
| Degree of protection                    | IP20 (not assessed by UL)                |
| 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)                  |
| 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          | 2 transistor outputs, passive |
| Minimum switching voltage | 3 V DC                        |
| Maximum switching voltage | 30 V DC                       |
| Min. contact current      | 5 mA (short-circuit-proof)    |
| Max. switching current    | 50 mA (short-circuit-proof)   |
| Switching frequency       | ≤ 5 kHz                       |

### Power supply

|                          |                                             |
|--------------------------|---------------------------------------------|
| Nominal supply voltage   | 24 V DC                                     |
| Supply voltage range     | 19.2 V DC ... 30 V DC (24 V DC -20%...+25%) |
| Max. current consumption | < 28 mA (24 V DC)                           |
| Power dissipation        | ≤ 800 mW                                    |
| Power consumption        | ≤ 800 mW                                    |

### Connection data

|                                  |                     |
|----------------------------------|---------------------|
| Connection method                | Push-in connection  |
| Stripping length                 | 8 mm                |
| Conductor cross section solid    | 0.2 mm² ... 1.5 mm² |
| Conductor cross section flexible | 0.2 mm² ... 1.5 mm² |
| Conductor cross section AWG      | 24 ... 16           |

### General

|                 |   |
|-----------------|---|
| No. of channels | 1 |
|-----------------|---|

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## Technical data

### General

|                               |                                         |
|-------------------------------|-----------------------------------------|
| Status display                | Green LED (supply voltage)              |
|                               | LED yellow (switching state)            |
|                               | Red LED (line errors)                   |
| Degree of pollution           | 2                                       |
| Overvoltage category          | II                                      |
| Electromagnetic compatibility | Conformance with EMC directive          |
| Interference emission         | EN 61000-6-4                            |
| Housing material              | PA 6.6-FR                               |
| Color                         | gray                                    |
| Designation                   | Input/output/supply, DIN rail connector |
|                               | Output 1/output 2                       |
| Conformance                   | CE-compliant, additionally EN 61326-1   |
| ATEX                          | # II 3 G Ex nA IIC T4 Gc X              |
| UL, USA/Canada                | UL 508 Listed                           |
|                               | UL 61010 Listed                         |
|                               | Class I, Div. 2, Groups A, B, C, D T4   |
|                               | Class I, Zone 2, Group IIC T4           |
| SIL                           | 2                                       |

### Safety characteristic data

|                              |   |
|------------------------------|---|
| Safety Integrity Level (SIL) | 1 |
|                              | 1 |

### 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        |

## Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

### Technical data

#### Standards and Regulations

|                       |                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------|
| Standards/regulations | EN 61000-4-6                                                                            |
| Evaluation criterion  | A                                                                                       |
| Conformance           | CE-compliant, additionally EN 61326-1                                                   |
| ATEX                  | # II 3 G Ex nA IIC T4 Gc X                                                              |
| UL, USA/Canada        | UL 508 Listed                                                                           |
|                       | UL 61010 Listed                                                                         |
|                       | Class I, Div. 2, Groups A, B, C, D T4                                                   |
|                       | Class I, Zone 2, Group IIC T4                                                           |
| DNV GL-Temperature    | B                                                                                       |
| DNV GL-Humidity       | B                                                                                       |
| DNV GL-Vibration      | A                                                                                       |
| DNV GL-EMC            | B                                                                                       |
| DNV GL-Enclosure      | Required protection according to the Rules shall be provided upon installation on board |

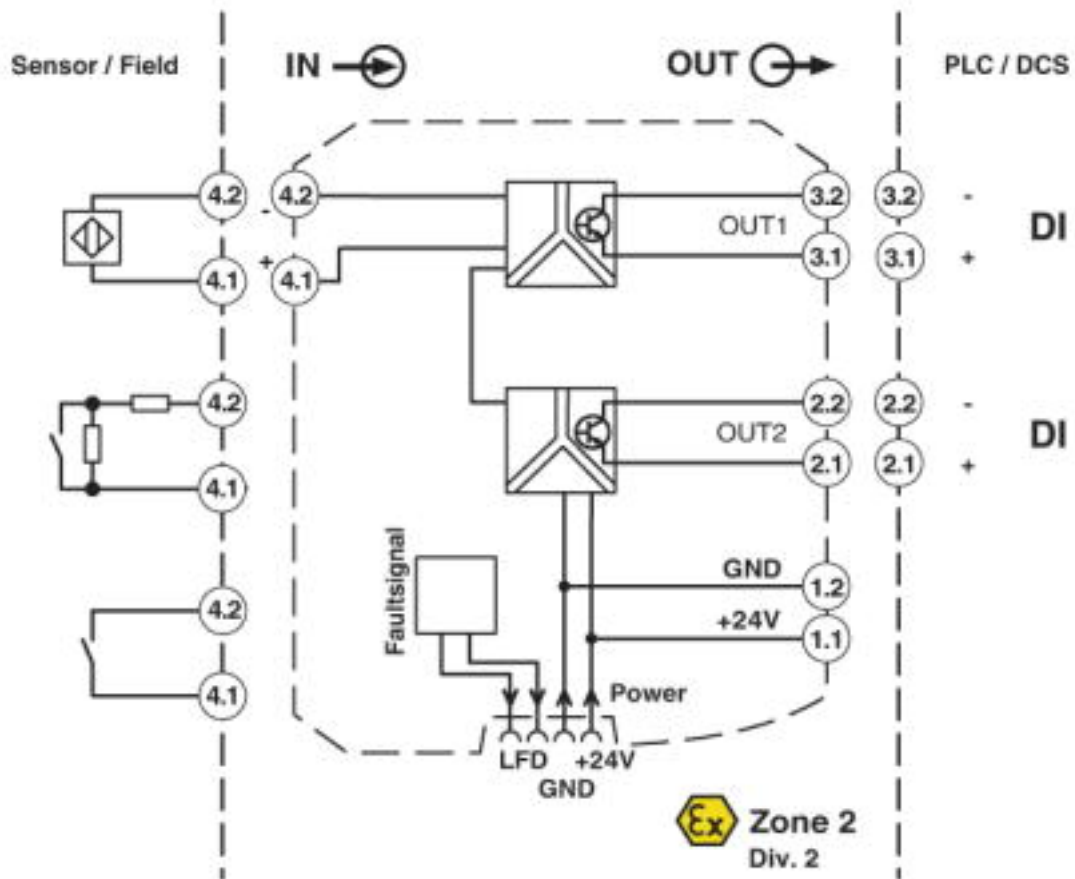
#### Environmental Product Compliance

|            |                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------|
| REACH SVHC | Lead 7439-92-1                                                                                      |
| China RoHS | Environmentally Friendly Use Period = 50 years                                                      |
|            | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

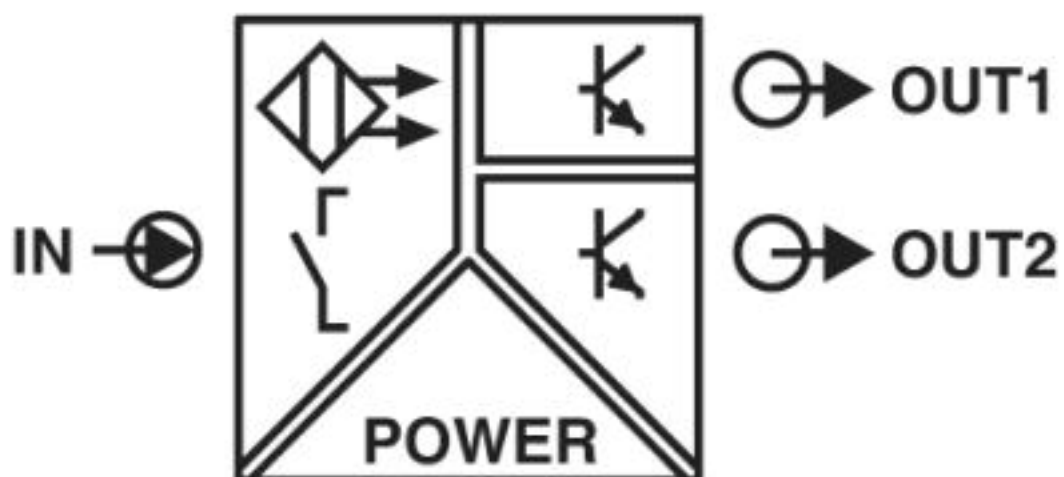
### Drawings

# Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

Block diagram



Pictogram



## Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

### Classifications

#### eCl@ss

|            |          |
|------------|----------|
| eCl@ss 4.0 | 27210100 |
| eCl@ss 4.1 | 27210100 |
| eCl@ss 5.0 | 27210100 |
| eCl@ss 5.1 | 27210100 |
| eCl@ss 6.0 | 27210100 |
| eCl@ss 7.0 | 27210121 |
| eCl@ss 8.0 | 27210121 |
| eCl@ss 9.0 | 27210121 |

#### ETIM

|          |          |
|----------|----------|
| ETIM 2.0 | EC001485 |
| ETIM 3.0 | EC001485 |
| ETIM 4.0 | EC001485 |
| ETIM 5.0 | EC001485 |
| ETIM 6.0 | EC001485 |
| ETIM 7.0 | EC001485 |

#### UNSPSC

|               |          |
|---------------|----------|
| UNSPSC 6.01   | 30211506 |
| UNSPSC 7.0901 | 39121008 |
| UNSPSC 11     | 39121008 |
| UNSPSC 12.01  | 39121008 |
| UNSPSC 13.2   | 39121008 |
| UNSPSC 18.0   | 39121008 |
| UNSPSC 19.0   | 39121008 |
| UNSPSC 20.0   | 39121008 |
| UNSPSC 21.0   | 39121008 |

### Approvals

#### Approvals

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##### Approvals

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

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##### Ex Approvals

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

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#### Approval details

# Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

## Approvals

|        |                                                                                   |                                                                                   |            |
|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------|
| DNV GL |  | <a href="https://approvalfinder.dnvgl.com/">https://approvalfinder.dnvgl.com/</a> | TAA00000AG |
|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------|

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

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

|                   |                    |  |  |
|-------------------|--------------------|--|--|
| Functional Safety | 07-06-39 R006 V1R2 |  |  |
|-------------------|--------------------|--|--|

|              |                                                                                    |  |  |
|--------------|------------------------------------------------------------------------------------|--|--|
| cULus Listed |  |  |  |
|--------------|------------------------------------------------------------------------------------|--|--|

## Accessories

### Accessories

#### Device marking

Plastic label - UC-EMLP (11X9) - 0819291



Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Plastic label - UC-EMLP (11X9) YE - 0822602



Plastic label, Sheet, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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### Accessories

#### Plastic label - UC-EMLP (11X9) SR - 0828094



Plastic label, Sheet, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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#### Plastic label - US-EMLP (11X9) - 0828789



Plastic label, Card, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

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#### Plastic label - US-EMLP (11X9) YE - 0828871



Plastic label, Card, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

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#### Plastic label - US-EMLP (11X9) SR - 0828872



Plastic label, Card, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

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#### Device marker - LS-EMLP (11X9) WH - 0831678



Device marker, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255



## Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

### Accessories

Device marker - LS-EMLP (11X9) YE - 0831732



Device marker, Sheet, yellow, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

Device marker - LS-EMLP (11X9) SR - 0831705



Device marker, Sheet, silver, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

### DIN rail connector

DIN rail bus connectors - ME 6,2 TBUS-2 1,5/5-ST-3,81 GN - 2869728



DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

### End cover

End cover - D-UKK 3/5 - 2770024



End cover, length: 56 mm, width: 2.5 mm, height: 52 mm, color: gray

End cover - D-UKK 3/5 BU - 2770105



End cover, length: 56 mm, width: 2.5 mm, height: 62 mm, color: blue

### Insulating sleeve

## Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

### Accessories

Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black



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Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray



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Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green



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Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



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Insulating sleeve - MPS-IH BU - 0201689

Insulating sleeve, color: blue



## Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

### Accessories

Insulating sleeve - MPS-IH RD - 0201676

Insulating sleeve, color: red



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Insulating sleeve - MPS-IH WH - 0201663

Insulating sleeve, color: white



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### Labeled device marker

Plastic label - UC-EMLP (11X9) CUS - 0824547



Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

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Plastic label - UC-EMLP (11X9) YE CUS - 0824548



Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

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Plastic label - UC-EMLP (11X9) SR CUS - 0828098



Plastic label, can be ordered: by sheet, silver, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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### Module carrier

## Isolation amplifier - MACX MCR-SL-NAM-2T-SP - 2924278

### Accessories

Module carrier - TC-2D37SUB-ADIO32-2EX-P-UNI - 2904684



Universal Termination Carrier for connecting 16 two-channel MACX Analog Ex i signal conditioners to digital or analog I/O cards, via two D-SUB connectors, 37-pos. (1:1 connection)

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### Power module

Power and error message module - MACX MCR-PTB - 2865625



Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

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Power and error message module - MACX MCR-PTB-SP - 2924184



Power and fault signaling module with Push-in connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

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### Test plug terminal block

Test plugs - MPS-MT - 0201744



Test plugs, with solder connection up to 1 mm<sup>2</sup> conductor cross section, color: gray

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Component terminal block - UKK 5-2R/NAMUR - 2941662



Double-level terminal block, with preassembled resistors

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