

# Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

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NAMUR 2-channel signal conditioner for operating proximity sensors and switches. The signals are transmitted to the control level via 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
- ✓ Up to SIL 2 according to EN 61508
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ Line fault detection (LFD), can be activated/deactivated, error indicated by flashing red LED with disabling of transistor output
- ✓ 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-channel
- ✓ Transistor signal output (passive); up to 5 kHz
- ✓ 3-way electrical isolation
- ✓ Direction of operation can be selected (operating or closed circuit current behavior)



## Key Commercial Data

|              |   |
|--------------|---|
| Packing unit | 1 pc  |
| GTIN         | <br>4 046356 491754 |
| GTIN         | 4046356491754   |

## Technical data

### Note

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

### Dimensions

|        |          |
|--------|----------|
| Width  | 12.5 mm  |
| Height | 116 mm   |
| Depth  | 113.7 mm |

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## Technical data

### Dimensions

|  |  |
|--|--|
|  | 114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715) |
|--|--|

### Ambient conditions

|   |  |
|---|--|
| Ambient temperature (operation)         | -20 °C ... 60 °C (Any mounting position) |
| Ambient temperature (storage/transport) | -40 °C ... 80 °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 (IEC/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          | 1 transistor output, passive (per channel) |
| 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 | < 34 mA (24 V DC)                           |
| Power dissipation        | 1000 mW                                     |
| Power consumption        | 1000 mW                                     |

### Connection data

|                                  |   |
|----------------------------------|---|
| Connection method                | Push-in connection                          |
| Stripping length                 | 8 mm  |
| Conductor cross section solid    | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross section flexible | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross section AWG      | 24 ... 16                                   |

### General

# Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

## Technical data

### General

|                               |   |
|-------------------------------|---|
| No. of channels               | 2   |
| 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  |
| Electrical isolation          | 375 V (Peak value in accordance with IEC/EN 60079-11) |
| Designation                   | Input/output/supply, DIN rail connector               |
| Rated insulation voltage      | 300 V <sub>rms</sub>                                  |
| Test voltage                  | 2.5 kV AC (50 Hz, 1 min.)                             |
| Insulation                    | Safe isolation in accordance with IEC/EN 61010-1      |
| Designation                   | Input/supply, DIN rail connector                      |
| Electrical isolation          | 375 V (Peak value in accordance with IEC/EN 60079-11) |
| Designation                   | Output 1/output 2                                     |
| Rated insulation voltage      | 50 V <sub>rms</sub>                                   |
| Test voltage                  | 1 kV AC (50 Hz, 1 min.)                               |
| Insulation                    | Basic insulation in accordance with IEC/EN 61010-1    |

### Safety characteristic data

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

### 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       |

# Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

## Technical data

### Standards and Regulations

|                       |                         |
|-----------------------|-------------------------|
| Standards/regulations | EN 61000-4-3            |
| Evaluation criterion  | A                       |
| Standards/regulations | EN 61000-4-4            |
| Designation           | Conducted interferences |
| Standards/regulations | EN 61000-4-6            |
| Evaluation criterion  | A                       |
| Electrical isolation  | 3-way isolation         |

### Conformance/approvals

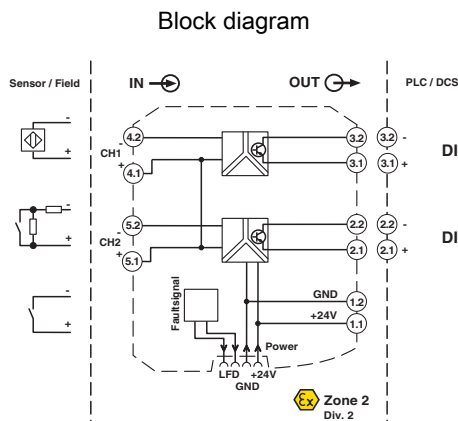
|                 |   |
|-----------------|---|
| Designation     | CE  |
| Certificate     | CE-compliant  |
| Additional text | and EN 61326  |
| Designation     | ATEX  |
| Identification  | # II 3 G Ex nA IIC T4 Gc X  |
| Designation     | UL, USA / Canada  |
| Identification  | UL 508 Listed   |
|                 | UL 61010 Listed   |
|                 | Class I, Div. 2, Groups A, B, C, D T4   |
|                 | Class I, Zone 2, Group IIC T4   |
| Designation     | 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   |
| Designation     | Shipbuilding approval   |
| Certificate     | DNV GL TAA00000AG   |
| Designation     | Safety Integrity Level (SIL, IEC 61508)   |
| Identification  | 2   |
| Temperature     | B   |
| Humidity        | B   |
| Vibration       | A   |
| EMC             | B   |
| Enclosure       | Required protection according to the Rules shall be provided upon installation on board |

### Environmental Product Compliance

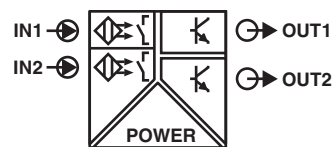
|            |   |
|------------|---|
| REACH SVHC | Lead 7439-92-1  |
| China RoHS | Environmentally Friendly Use Period = 50 years  |
|            | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

## Drawings

# Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281



Pictogram



## Classifications

### eCl@ss

|               |          |
|---------------|----------|
| eCl@ss 10.0.1 | 27210121 |
| eCl@ss 11.0   | 27210121 |
| 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 9.0    | 27210121 |

### ETIM

|          |          |
|----------|----------|
| ETIM 2.0 | EC001485 |
| ETIM 3.0 | EC001485 |
| ETIM 4.0 | 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 |

# Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

## Approvals

### Approvals

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#### Approvals

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

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#### Ex Approvals

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

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## Approval details

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

#### Component terminal block

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



Double-level terminal block, with preassembled resistors

## Device marking

## Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

### Accessories

#### 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

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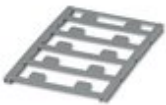
#### Plastic label - UC-EMLP (11X9) YE - 0822602



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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#### 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

## Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

### Accessories

#### 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

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#### 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

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#### 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

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### DIN rail connector

#### DIN rail bus connectors - ME 6,2 TBUS-2 1,5/5-ST-3,81 GY - 2695439



DIN rail connector (TBUS), 5-pos., for bridging the supply voltage, can be snapped onto NS 35/... DIN rails according to EN 60715

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### End cover



## Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

### Accessories

End cover - D-UKK 3/5 - 2770024



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

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



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

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### Insulating sleeve

Insulating sleeve - MPS-IH WH - 0201663



Insulating sleeve, color: white

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Insulating sleeve - MPS-IH RD - 0201676



Insulating sleeve, color: red

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Insulating sleeve - MPS-IH BU - 0201689



Insulating sleeve, color: blue

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## Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

### Accessories

Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green



Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray



Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black



### 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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## Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

### Accessories

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

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

### Module carrier

Module carrier - TC-D37SUB-AIO16-EX-PS-UNI - 2902932



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection), with HART multiplexer connection

Module carrier - TC-D37SUB-ADIO16-EX-P-UNI - 2924854



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection)

### 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

# Isolation amplifier - MACX MCR-SL-2NAM-T-SP - 2924281

## Accessories

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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## Power supply

Power supply unit - QUINT4-SYS-PS/1AC/24DC/2.5/SC - 2904614



Primary-switched power supply unit, QUINT POWER, Screw connection, DIN rail mounting, input: 1-phase, output: 24 V DC / 2.5 A

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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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