

# Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

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Isolating amplifier with safe electrical isolation and wide-range power supply (24 V ... 230 V AC/DC). DIP switches on the front, over 1600 signal conversions can be set. Standard configuration (IN 0 ... 10 V/OUT 0 ... 20 mA), spring-cage connection, SIL.

## Your advantages

- ✓ Over 1600 signal conversions can be set via DIP switches on the front
- ✓ Installation in zone 2 permitted
- ✓ Up to SIL 2 according to EN 61508
- ✓ Analog signal conditioner for isolating, filtering, amplifying, and converting standard analog signals
- ✓ Plug-in screw or spring-cage connection technology (Push-in technology)
- ✓ Active or passive output
- ✓ Configurable input and output signals including bipolar current and voltage signals
- ✓ Status indicator for supply voltage
- ✓ Wide-range power supply of 19.2 ... 253 V AC/DC
- ✓ 3-way electrical isolation



## Key Commercial Data

|              |   |
|--------------|---|
| Packing unit | 1 pc  |
| GTIN         | <br>4 046356 466998 |
| GTIN         | 4046356466998   |

## 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 |

# Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

## 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 ... 70 °C  |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C  |
| Maximum altitude                        | ≤ 2000 m  |
| Degree of protection                    | IP20 (not assessed by UL)   |
| Noise immunity                          | EN 61000-6-2 When being exposed to interference, there may be minimal deviations. |

### Input data

|                      |  |
|----------------------|--|
| Designation          | Voltage/current input                        |
| Number of inputs     | 1  |
| Voltage input signal | 0 mV ... 50 mV                               |
|                      | 0 mV ... 60 mV                               |
|                      | 0 mV ... 75 mV                               |
|                      | 0 mV ... 100 mV                              |
|                      | 0 mV ... 120 mV                              |
|                      | 0 mV ... 150 mV                              |
|                      | 0 mV ... 200 mV                              |
|                      | 0 mV ... 300 mV                              |
|                      | 0 mV ... 500 mV                              |
|                      | 0 V ... 1 V                                  |
|                      | 0 V ... 1.5 V                                |
|                      | 0 V ... 2 V                                  |
|                      | 0 V ... 3 V                                  |
|                      | 0 V ... 5 V                                  |
|                      | 0 V ... 10 V (Configurable via DIP switches) |
|                      | 0 V ... 15 V                                 |
|                      | 0 V ... 20 V                                 |
|                      | 0 V ... 30 V                                 |
|                      | 0 V ... 50 V                                 |
|                      | 0 V ... 100 V                                |
|                      | -50 mV ... 50 mV                             |
|                      | -60 mV ... 60 mV                             |
|                      | -75 mV ... 75 mV                             |
|                      | -100 mV ... 100 mV                           |
|                      | -120 mV ... 120 mV                           |
|                      | -150 mV ... 150 mV                           |
|                      | -200 mV ... 200 mV                           |
|                      | -300 mV ... 300 mV                           |

## Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

### Technical data

#### Input data

|                      |   |
|----------------------|---|
|                      | -500 mV ... 500 mV                            |
|                      | -1 V ... 1 V                                  |
|                      | -1.5 V ... 1.5 V                              |
|                      | -2 V ... 2 V                                  |
|                      | -3 V ... 3 V                                  |
|                      | -5 V ... 5 V                                  |
|                      | -10 V ... 10 V                                |
|                      | -15 V ... 15 V                                |
|                      | -20 V ... 20 V                                |
|                      | -30 V ... 30 V                                |
|                      | -50 V ... 50 V                                |
|                      | -100 V ... 100 V                              |
|                      | 1 V ... 5 V                                   |
|                      | 2 V ... 10 V                                  |
| Current input signal | 0 mA ... 1 mA (Configurable via DIP switches) |
|                      | 0 mA ... 1.5 mA                               |
|                      | 0 mA ... 2 mA                                 |
|                      | 0 mA ... 3 mA                                 |
|                      | 0 mA ... 5 mA                                 |
|                      | 0 mA ... 10 mA                                |
|                      | 0 mA ... 15 mA                                |
|                      | 0 mA ... 20 mA                                |
|                      | 0 mA ... 30 mA                                |
|                      | 0 mA ... 50 mA                                |
|                      | 0 mA ... 100 mA                               |
|                      | -1 mA ... 1 mA                                |
|                      | -1.5 mA ... 1.5 mA                            |
|                      | -2 mA ... 2 mA                                |
|                      | -3 mA ... 3 mA                                |
|                      | -5 mA ... 5 mA                                |
|                      | -10 mA ... 10 mA                              |
|                      | -15 mA ... 15 mA                              |
|                      | -20 mA ... 20 mA                              |
|                      | -30 mA ... 30 mA                              |
|                      | -50 mA ... 50 mA                              |
|                      | -100 mA ... 100 mA                            |
|                      | 1 mA ... 5 mA                                 |
|                      | 2 mA ... 10 mA                                |
|                      | 4 mA ... 20 mA                                |
| max. input voltage   | ± 100 V                                       |

# Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

## Technical data

### Input data

|                                   |   |
|-----------------------------------|---|
| Max. input current                | ± 100 mA                                  |
| Input resistance of voltage input | approx. 1 MΩ (±1 V DC ... ±100 V DC)      |
| Input resistance current input    | approx. 10 Ω (± 10 mA DC ... ± 100 mA DC) |

### Output data

|                                 |  |
|---------------------------------|--|
| Output name                     | Voltage output / current output                |
| Number of outputs               | 1  |
| Configurable/programmable       | Yes, can be switched                           |
| Voltage output signal           | 0 V ... 10 V (Configurable via DIP switches)   |
|                                 | 0 V ... 5 V                                    |
|                                 | 2 V ... 10 V                                   |
|                                 | 1 V ... 5 V                                    |
|                                 | -10 V ... 10 V                                 |
|                                 | -5 V ... 5 V                                   |
|                                 | 0 V ... 2.5 V                                  |
|                                 | 0.5 V ... 2.5 V                                |
|                                 | -2.5 V ... 2.5 V                               |
| Current output signal           | 0 mA ... 5 mA                                  |
|                                 | 0 mA ... 10 mA                                 |
|                                 | 0 mA ... 20 mA (Configurable via DIP switches) |
|                                 | 1 mA ... 5 mA                                  |
|                                 | 2 mA ... 10 mA                                 |
|                                 | 4 mA ... 20 mA                                 |
|                                 | -5 mA ... 5 mA                                 |
|                                 | -10 mA ... 10 mA                               |
|                                 | -20 mA ... 20 mA                               |
| Max. output voltage             | 15 V   |
| Max. output current             | 35 mA  |
| Load/output load voltage output | ≥ 1 kΩ (10 V)                                  |
| Load/output load current output | ≤ 600 Ω (20 mA; active)                        |
|                                 | passive: ≤ (UB-2 V) / I <sub>outmax</sub>      |
| Ripple                          | < 10 mV <sub>rms</sub>                         |

### Power supply

|                      |  |
|----------------------|--|
| Supply voltage range | 24 V ... 230 V AC/DC (-20 %/+10 %, 50/60 Hz) |
|----------------------|--|

### Connection data

|                                  |   |
|----------------------------------|---|
| Connection method                | Push-in connection                          |
| Connection technology            | COMBICON                                    |
| 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> |

# Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

## Technical data

### Connection data

|                             |           |
|-----------------------------|-----------|
| Conductor cross section AWG | 24 ... 16 |
|-----------------------------|-----------|

### General

|                                 |   |
|---------------------------------|---|
| No. of channels                 | 1   |
| Maximum transmission error      | ≤ 0.1 % (Compared to the final value)   |
| Maximum temperature coefficient | 0.0075 %/K  |
| Limit frequency (3 dB)          | 10 kHz (Can be switched to 30 Hz)   |
| Alignment zero                  | ± 4 %   |
| Alignment span                  | ± 4 %   |
| Step response (10-90%)          | 35 µs (at 10 kHz)<br>11 ms (At 30 Hz)   |
| Protective circuit              | Transient protection  |
| Overvoltage category            | II  |
| Degree of pollution             | 2   |
| Rated insulation voltage        | 300 V AC (EN 61010-1)   |
| Electromagnetic compatibility   | Conformance with EMC directive  |
| Noise immunity                  | EN 61000-6-2 When being exposed to interference, there may be minimal deviations. |
| Color                           | gray  |
| Housing material                | PA 6.6-FR   |
| Mounting position               | any   |

### Standards and Regulations

|                               |                                |
|-------------------------------|--------------------------------|
| Electromagnetic compatibility | Conformance with EMC directive |
| Designation                   | GB Standard                    |
| Standards/regulations         | GB 3836.1<br>GB 3836.8         |

### Conformance/approvals

|                |                          |
|----------------|--------------------------|
| Designation    | CE                       |
| Certificate    | CE-compliant             |
| Designation    | ATEX                     |
| Identification | # II 3 G Ex nA IIC T4 Gc |
| Certificate    | BVS 09 ATEX E 028 X      |
| Designation    | IECEX                    |
| Identification | Ex ec IIC T4 Gc          |
| Certificate    | IECEX BVS 09.0013X       |
| Designation    | CCC / China-Ex           |
| Identification | Ex nA IIC T4 Gc          |
| Designation    | INMETRO                  |
| Identification | Ex ec IIC T4 Gc          |
| Certificate    | DNV 21.0125 X            |
| Designation    | UL, USA / Canada         |

# Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

## Technical data

### Conformance/approvals

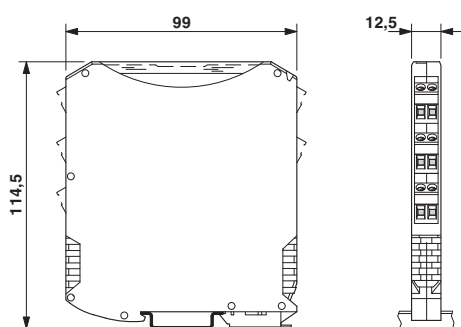
|                |   |
|----------------|---|
| Identification | UL 61010 Listed   |
|                | Class I, Div. 2, Groups A, B, C, D T4   |
|                | Class I, Zone 2, Group IIC  |
| Designation    | Shipbuilding approval   |
| Certificate    | DNV GL TAA00000AG   |
| Designation    | Safety 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

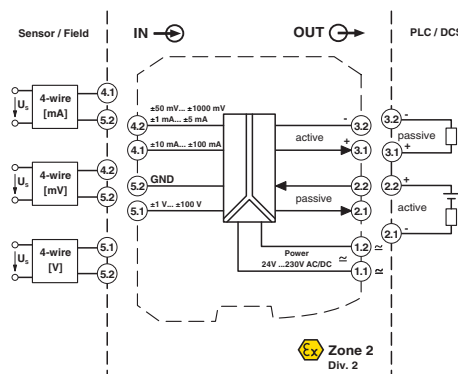
|            |   |
|------------|---|
| REACH SVHC | Lead 7439-92-1  |
| China RoHS | Environmentally Friendly Use Period = 50 years  |
|            | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

## Drawings

Dimensional drawing

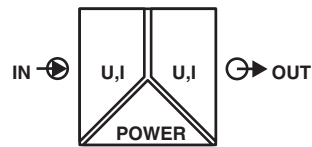


Block diagram

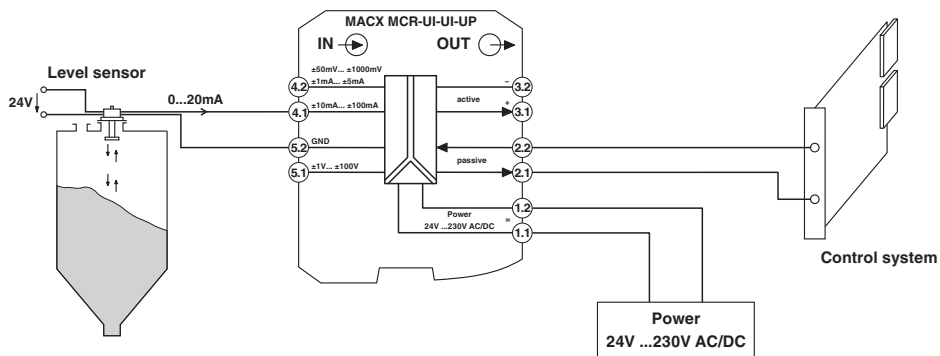


# Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

Pictogram

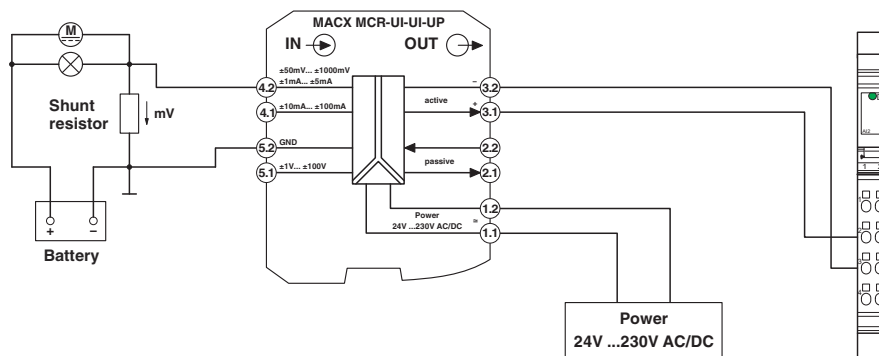


Application drawing



Level measurement with analog input terminals (active input card)

Application drawing



Shunt measurement and Inline terminal with analog input channels within an Inline station (passive input card)

# Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

## Classifications

### eCl@ss

|               |          |
|---------------|----------|
| eCl@ss 10.0.1 | 27210120 |
| eCl@ss 11.0   | 27210120 |
| 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    | 27210120 |
| eCl@ss 9.0    | 27210120 |

### ETIM

|          |          |
|----------|----------|
| ETIM 4.0 | EC002653 |
| ETIM 6.0 | EC002653 |
| ETIM 7.0 | EC002653 |

### 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 / CCC / Functional Safety / cULus Listed

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#### Ex Approvals

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

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### Approval details



# Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

## 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 |
|------------|--|---|---------------|

|     |  |  |                  |
|-----|--|--|------------------|
| CCC |  |  | 2021122304114078 |
|-----|--|--|------------------|

|                   |  |  |              |
|-------------------|--|--|--------------|
| Functional Safety |  |  | BVS Pb 02/09 |
|-------------------|--|--|--------------|

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

## Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

### 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

## Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

### Accessories

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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### 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



## Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

### 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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## Signal conditioner - MACX MCR-UI-UI-UP-SP-NC - 2811569

### 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

### 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

### 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