

## 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                                                                                           |
| Weight per Piece (excluding packing) | 150.000 g                                                                                               |
| Custom tariff number                 | 85437090                                                                                                |
| Country of origin                    | Germany                                                                                                 |

### Technical data

#### Note

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

## 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  | 114.5 mm |

### 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

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

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## Technical data

### Input data

|                      |                                               |
|----------------------|-----------------------------------------------|
|                      | -75 mV ... 75 mV                              |
|                      | -100 mV ... 100 mV                            |
|                      | -120 mV ... 120 mV                            |
|                      | -150 mV ... 150 mV                            |
|                      | -200 mV ... 200 mV                            |
|                      | -300 mV ... 300 mV                            |
|                      | -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                              |

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## Technical data

### Input data

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

|                                 |                                                |
|---------------------------------|------------------------------------------------|
| 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)                        |

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## Technical data

### Output data

|        |                                                         |
|--------|---------------------------------------------------------|
|        | passive: $\leq (U_B - 2 \text{ V}) / I_{\text{outmax}}$ |
| Ripple | $< 10 \text{ mV}_{\text{rms}}$                          |

### 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> |
| Conductor cross section AWG      | 24 ... 16                                   |

### General

|                                 |                                                                                   |
|---------------------------------|-----------------------------------------------------------------------------------|
| No. of channels                 | 1                                                                                 |
| Maximum transmission error      | $\leq 0.1 \%$ (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                  | $\pm 4 \%$                                                                        |
| Alignment span                  | $\pm 4 \%$                                                                        |
| Step response (10-90%)          | 35 $\mu\text{s}$ (at 10 kHz)                                                      |
|                                 | 11 ms (At 30 Hz)                                                                  |
| Protective circuit              | Transient protection                                                              |
| Overvoltage category            | II                                                                                |
| Degree of pollution             | 2                                                                                 |
| Rated insulation voltage        | 300 V AC                                                                          |
| 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                      |
|                               | GB 3836.8                      |

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

### Technical data

#### 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 nA IIC T4 Gc                                                                         |
| Certificate    | IECEX BVS 09.0013X                                                                      |
| Designation    | CCC / China-Ex                                                                          |
| Identification | Ex nA IIC T4 Gc                                                                         |
| Designation    | UL, USA/Canada                                                                          |
| Identification | UL 61010 Listed                                                                         |
|                | Class I, Div. 2, Groups A, B, C, D T6                                                   |
|                | 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 |

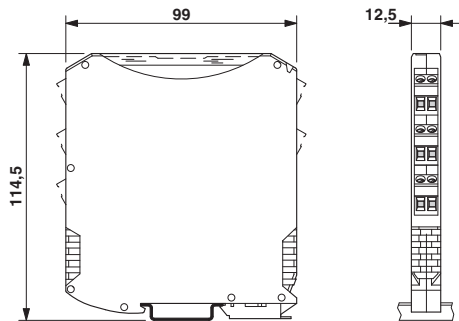
#### Environmental Product Compliance

|            |                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------|
| 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" |

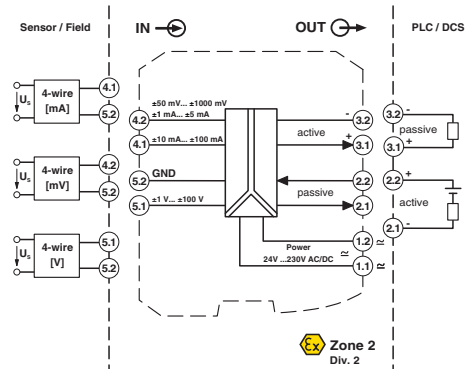
### Drawings

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

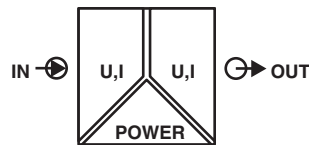
Dimensional drawing



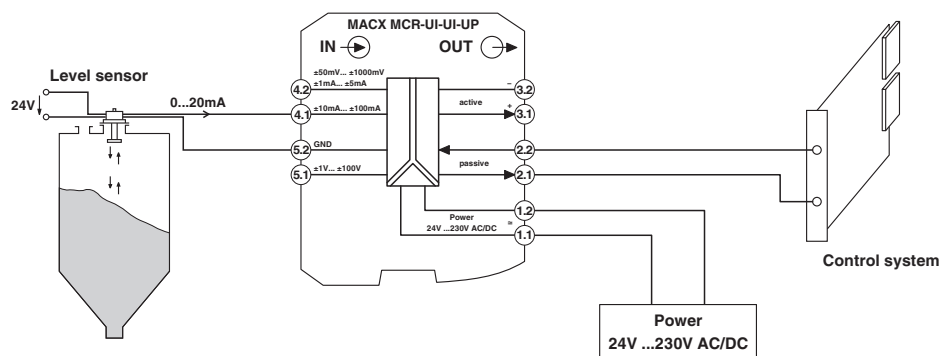
Block diagram



Pictogram



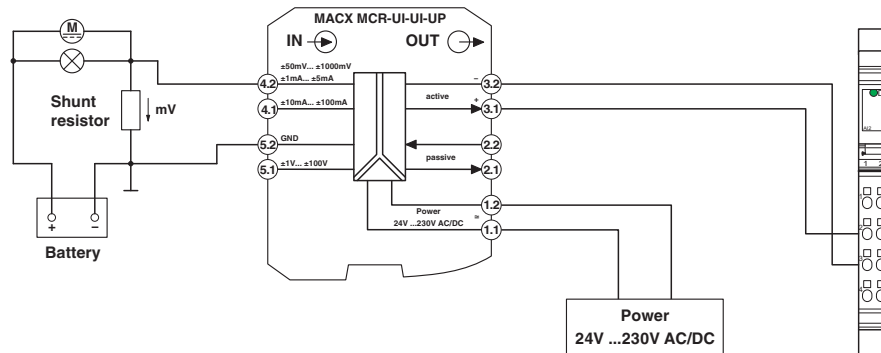
Application drawing



Level measurement with analog input terminals (active input card)

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Application drawing



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

### 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 |



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

### Classifications

#### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121008 |
|-------------|----------|

### Approvals

#### Approvals

#### Approvals

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

#### Ex Approvals

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

### 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 |  |  | BVS Pb 02/09 |
|-------------------|--|--|--------------|

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

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

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

### 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

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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

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

### Accessories

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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

#### 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

#### 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

#### 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

### Insulating sleeve

#### Insulating sleeve - MPS-IH WH - 0201663

Insulating sleeve, color: white



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

### Accessories

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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Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



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Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green



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Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray



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

### Accessories

Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black



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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



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



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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

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

## Accessories

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