# MACX MCR-UI-UI-UP-SP-NC - Input signal conditioner

2811569

https://www.phoenixcontact.com/us/products/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 in accordance with 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

## Commercial data

| | |
|---|---|
| Item number | 2811569 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | C402 |
| Product key | DK1111 |
| GTIN | 4046356466998 |
| Weight per piece (including packing) | 183 g |
| Weight per piece (excluding packing) | 150 g |
| Customs tariff number | 85437090 |
| Country of origin | DE |

# Technical data

## Product properties

| | |
|---|---|
| Product type | Input signal conditioner |
| Product family | MACX Analog |
| No. of channels | 1 |
| Configuration | DIP switches |

## System properties

### Functionality

| | |
|---|---|
| Configuration | DIP switches |

## Electrical properties

| | |
|---|---|
| Alignment span | ± 4 % |
| Alignment zero | ± 4 % |
| Electrical isolation between input and output | yes |
| Limit frequency (3 dB) | 10 kHz (Can be switched to 30 Hz) |
| Protective circuit | Transient protection |
| Step response (10-90%) | 35 µs (10 kHz) |
| | 11 ms (30 Hz) |
| Maximum temperature coefficient | 0.0075 %/K |
| Maximum transmission error | ≤ 0.1 % (Compared to the final value) |

### Electrical isolation

| | |
|---|---|
| Test voltage | 2.5 kV AC (50 Hz, 60 s) |
| Overvoltage category | II |
| Pollution degree | 2 |

### Electrical isolation Input/output/power supply IEC/EN 61010-1

| | |
|---|---|
| Standards/regulations | IEC/EN 61010-1 |
| Rated insulation voltage | 300 $V_{rms}$ |
| Insulation | Safe isolation |

### Electrical isolation Input/output/power supply IEC/EN 60079-7

| | |
|---|---|
| Standards/regulations | IEC/EN 60079-7 |
| Rated insulation voltage | 275 V |

### Supply

| | |
|---|---|
| Nominal supply voltage range | 24 V AC/DC ... 230 V AC/DC -20 % ... +10 % (50/60 Hz) |
| Supply voltage range | 19.2 V AC/DC ... 253 V AC/DC (50/60 Hz) |
| Power dissipation | < 0.8 W (at 24 V DC / 20 mA) |
| | < 0.9 W (At 230 V AC / 20 mA) |

## Input data

Signal: Voltage/current

| | |
|---|---|
| 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 |
| | -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 |
| Min. voltage input signal | ± 50 mV |
| Max. voltage input signal | ± 100 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 |
| Minimum current input signal | ± 1 mA |
| Max. current input signal | ± 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

Signal: Voltage/current

| | |
|---|---|
| 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 |
| Max. voltage output signal | 15 V |
| Output signal voltage inverse | 0 V ... 2.5 V |
| | 0 V ... 5 V |
| | 0 V ... 10 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. current output signal | 35 mA |
| Output signal current inverse | 0 mA ... 5 mA |
| | 0 mA ... 10 mA |
| | 0 mA ... 20 mA |
| Load/output load voltage output | ≥ 1 kΩ (10 V) |
| Load/output load current output | ≤ 600 Ω (20 mA; active) |
| | passive: ≤ (UB-2 V) / $I_{outmax}$ |
| Ripple | < 10 $mV_{rms}$ |

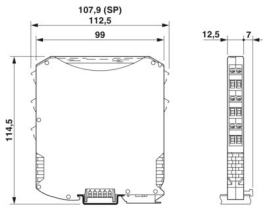
## Connection data

| | |
|---|---|
| Connection method | Push-in connection |
| Stripping length | 10 mm |
| Conductor cross-section rigid | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section flexible (2 conductors with same cross section) | 0.25 mm² ... 0.34 mm² (TWIN ferrule without plastic sleeve) |
| | 0.5 mm² ... 1.5 mm² (TWIN ferrule with plastic sleeve) |
| Conductor cross-section AWG | 24 ... 14 |
| | 24 ... 22 (TWIN ferrule without plastic sleeve) |
| | 20 ... 16 (TWIN ferrule with plastic sleeve) |

## Ex data

| | |
|---|---|
| Ex installation (EPL) | Gc |
| | Div. 2 |

## Dimensions

| | |
|---|---|
| Dimensional drawing |   |
| Width | 12.5 mm |
| Height | 107.9 mm |
| Depth | 113.7 mm |
| Depth NS 35/7,5 | 114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715) |

## Material specifications

| | |
|---|---|
| Color | gray (RAL 7042) |
| Housing material | PA 6.6-FR |

## Characteristics

Safety data: IEC 61508 - High demand

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

Safety data: IEC 61508 - High demand

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

Safety data: IEC 61508 - Low demand

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

Safety data: IEC 61508 - Low demand

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

## Environmental and real-life conditions

Ambient conditions

| | |
|---|---|
| Degree of protection | IP20 (not assessed by UL) |
| Ambient temperature (operation) | -20 °C ... 70 °C |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |

Altitude range (≤ 2000 m)

| | |
|---|---|
| Altitude | ≤ 2000 m (The technical data refers to altitudes ≤2000 m above mean sea level. For altitudes >2000 m above mean sea level, refer to the data sheet.) |
| Ambient temperature (operation) | -20 °C ... 70 °C |
| Safety-related maximum voltage $U_m$ | 275 V |

Altitude range (≤ 3000 m)

| | |
|---|---|
| Height range | > 2000 m ... 3000 m |
| Ambient temperature (operation) | -20 °C ... 60 °C |
| Safety-related maximum voltage $U_m$ | 190 V |

Altitude range (≤ 4000 m)

| | |
|---|---|
| Height range | > 3000 m ... 4000 m |
| Ambient temperature (operation) | -20 °C ... 55 °C |
| Safety-related maximum voltage $U_m$ | 60 V |

Altitude range (≤ 5000 m)

| | |
|---|---|
| Height range | > 4000 m ... 5000 m |
| Ambient temperature (operation) | -20 °C ... 45 °C |
| Safety-related maximum voltage $U_m$ | 60 V |

## Approvals

CE

| | |
|---|---|
| Certificate | CE-compliant |

ATEX

| | |
|---|---|
| Identification | Ⓔx II 3 G Ex nA IIC T4 Gc |
| Certificate | BVS 09 ATEX E 028 X |

UKCA Ex (UKEX)

| | |
|---|---|
| Identification | Ⓔx II 3 G Ex nA IIC T4 Gc |
| Certificate | PxCIF21UKEX2811459X |

IECEx

| | |
|---|---|
| Identification | Ex ec IIC T4 Gc |
| Certificate | IECEx BVS 09.0013X |

CCC / China-Ex

| | |
|---|---|
| Identification | Ex ec IIC T4 Gc |
| Certificate | 2021122304114078 |

UL, USA/Canada

| | |
|---|---|
| Identification | UL 61010 Listed |
| | Class I, Div. 2, Groups A, B, C, D T4 |
| | Class I, Zone 2, Group IIC |

Shipbuilding approval

| | |
|---|---|
| Certificate | DNV GL TAA00000AG |

Safety Integrity Level (SIL, IEC 61508)

| | |
|---|---|
| Identification | 2 |

INMETRO

| | |
|---|---|
| Identification | Ex ec IIC T4 Gc |
| Certificate | DNV 21.0125 X |

EAC Ex

| | |
|---|---|
| Identification | EAC Ex Ex ec IIC T4 Gc |
| Certificate | BY/112 02.01 TP012 103.01 00078 |

Shipbuilding data

| | |
|---|---|
| Temperature | B |
| Humidity | B |
| Vibration | A |
| EMC | B |
| Enclosure | Required protection according to the Rules shall be provided upon installation on board |

## EMC data

| | |
|---|---|
| Electromagnetic compatibility | Conformance with EMC directive |
| Noise immunity | EN 61000-6-2 |
| Note | When being exposed to interference, there may be minimal deviations. |

Noise emission

| | |
|---|---|
| Standards/regulations | EN 61000-6-4 |

Electromagnetic HF field

| | |
|---|---|
| Designation | Electromagnetic RF field |
| Standards/regulations | EN 61000-4-3 |
| Typical deviation from the measuring range final value | 1.9 % |

Fast transients (burst)

| | |
|---|---|
| Designation | Fast transients (burst) |
| Standards/regulations | EN 61000-4-4 |
| Typical deviation from the measuring range final value | 2 % |

Conducted interference

| | |
|---|---|
| Designation | Conducted interferences |
| Standards/regulations | EN 61000-4-6 |
| Typical deviation from the measuring range final value | 4.6 % |

## Standards and regulations

GB Standard

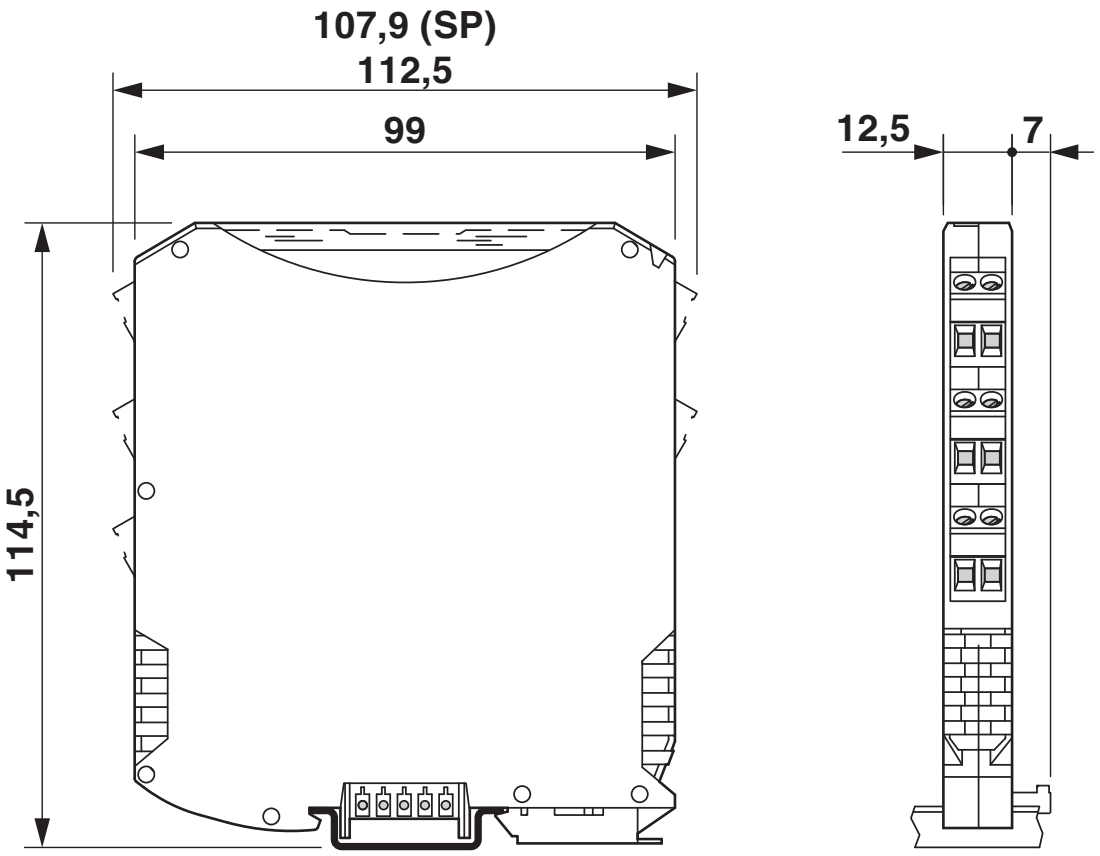
| | |
|---|---|
| Standards/regulations | GB/T 3836.1 |
| | GB/T 3836.3 |

## Mounting

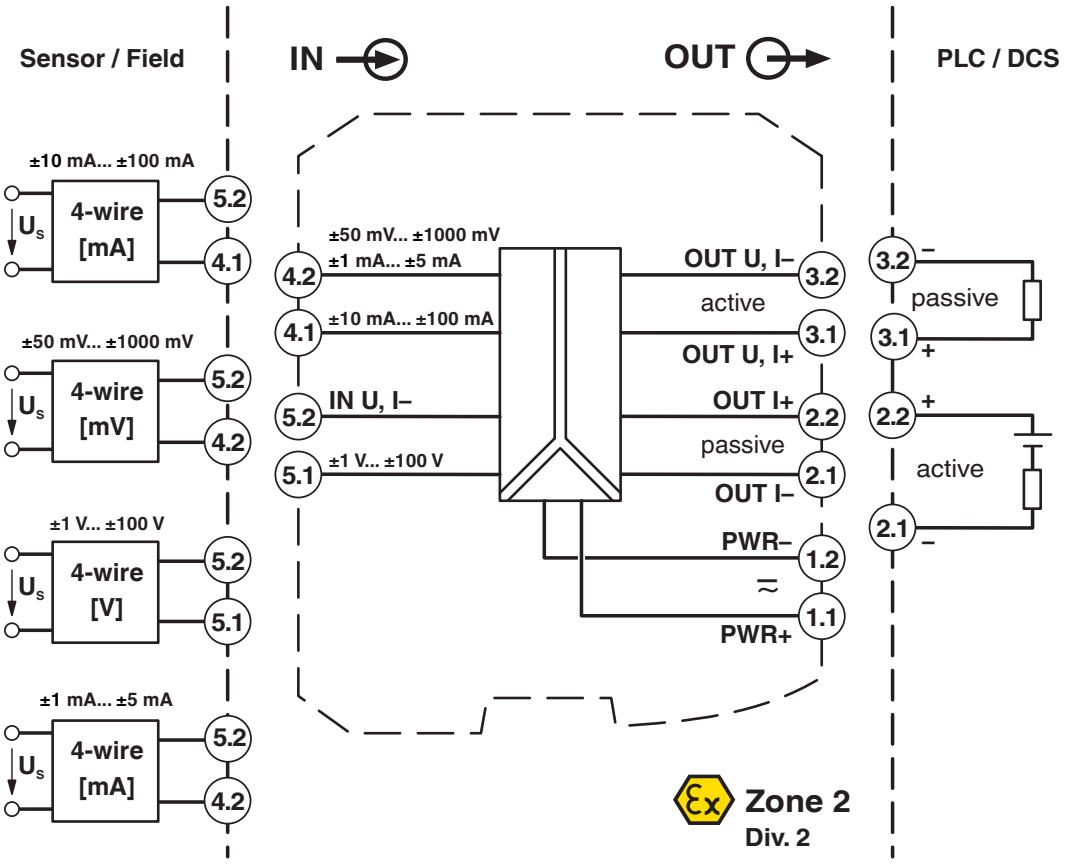
| | |
|---|---|
| Mounting type | DIN rail mounting |
| Mounting position | any |

## Drawings

Dimensional drawing



Block diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2811569

**UL Listed**
Approval ID: E330267

**cUL Listed**
Approval ID: E330267

**Functional Safety**
Approval ID: BVS Pb 02/09

**DNV**
Approval ID: TAA00000AG

**EAC Ex**
Approval ID: BY/112 02.01 TP012xx

**cUL Listed**
Approval ID: E199827

**UL Listed**
Approval ID: FILE E 199827

**IECEx**
Approval ID: IECEx BVS 09.0013X

**ATEX**
Approval ID: BVS 09 ATEX E 028 X

**INMETRO**
Approval ID: DNV 21.0125 X

**CCC**
Approval ID: 2021122304114078

## Classifications

### ECLASS

| | |
|---|---|
| ECLASS-13.0 | 27210120 |
| ECLASS-15.0 | 27210120 |

### ETIM

| | |
|---|---|
| ETIM 10.0 | EC002653 |

### UNSPSC

| | |
|---|---|
| UNSPSC 21.0 | 39121000 |

## Environmental product compliance

EU RoHS

| | |
|---|---|
| Fulfills EU RoHS substance requirements | Yes |
| Exemption | 6(c), 7(a), 7(c)-I |

China RoHS

| | |
|---|---|
| Environment friendly use period (EFUP) | EFUP-50 |
| | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

EU REACH SVHC

| | |
|---|---|
| REACH candidate substance (CAS No.) | Lead(CAS: 7439-92-1) |
| | 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol(CAS: 119-47-1) |
| | 2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol(CAS: 79-94-7) |
| SCIP | 8a57274a-5821-4a06-8052-8e2257a6bce5 |

EF3.1 Climate Change

| | |
|---|---|
| CO2e kg | 5.417 kg CO2e |



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