

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



2811297

<https://www.phoenixcontact.com/us/products/2811297>

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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), screw connection, SIL.

## Your advantages

- Over 1600 signal conversions can be set via DIP switches on the front
- Up to SIL 2 in accordance with EN 61508
- Installation in zone 2 permitted
- Analog signal conditioner for isolating, filtering, amplifying, and converting standard analog signals
- 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
- Plug-in screw or spring-cage connection technology (Push-in technology)
- 3-way electrical isolation
- Active or passive output

## Commercial data

Item number	2811297
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C402
Product key	CK1111
Catalog page	Page 118 (C-5-2019)
GTIN	4046356288910
Weight per piece (including packing)	193.3 g
Weight per piece (excluding packing)	167.2 g
Customs tariff number	85437090
Country of origin	DE

## Technical data

### Product properties

Product type	Signal conditioner
Product family	MACX Analog
No. of channels	1
Type	Signal conditioners with SIL functional safety
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)
Maximum power dissipation for nominal condition	< 0.9 W (20 mA)
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 <sub>rms</sub>
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
	0 mV ... 50 mV

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Voltage input signal	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
	0 mA ... 1 mA (Configurable via DIP switches)

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Current input signal	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

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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	$\geq 1 \text{ k}\Omega$ (10 V)
Load/output load current output	$\leq 600 \Omega$ (20 mA; active)
	passive: $\leq (U_B - 2 \text{ V}) / I_{\text{outmax}}$
Ripple	$< 10 \text{ mV}_{\text{rms}}$

## Connection data

Connection method	Screw connection
Stripping length	7 mm
Screw thread	M3
Conductor cross section rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section AWG	24 ... 14
Tightening torque	0.5 Nm ... 0.6 Nm

## Test socket

Max. diameter	2 mm
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## Ex data

Ex installation (EPL)	Gc
	Div. 2

## Dimensions

Dimensional drawing	
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Width	12.5 mm
Height	112.5 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

## 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
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### ATEX

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

### UKCA Ex (UKEX)

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Identification	Ex 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
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## Safety Integrity Level (SIL, IEC 61508)

Identification	2
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## INMETRO

Identification	Ex ec IIC T4 Gc
Certificate	DNV 21.0125 X

## EAC Ex

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

## DNV GL 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

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

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## 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



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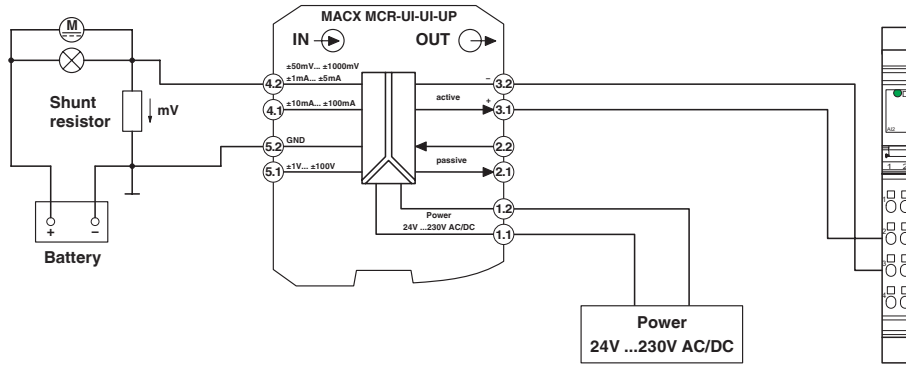


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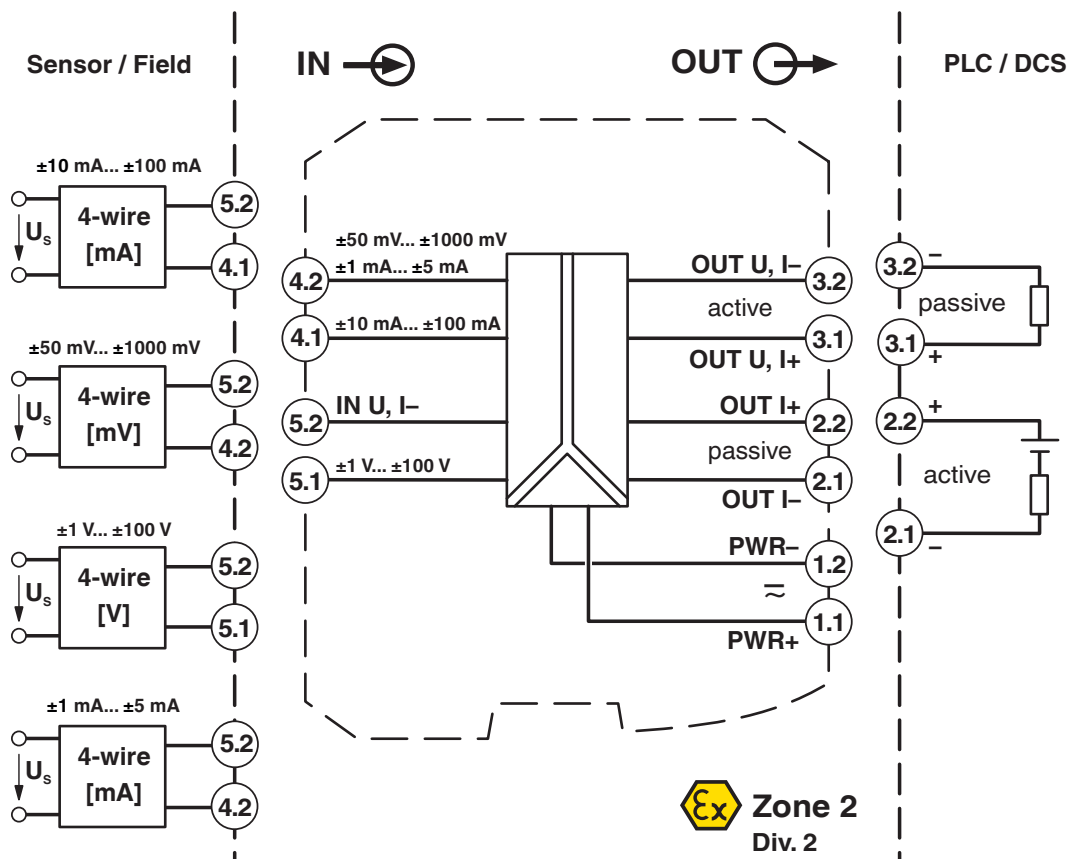
## Drawings

Application drawing



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

Block diagram



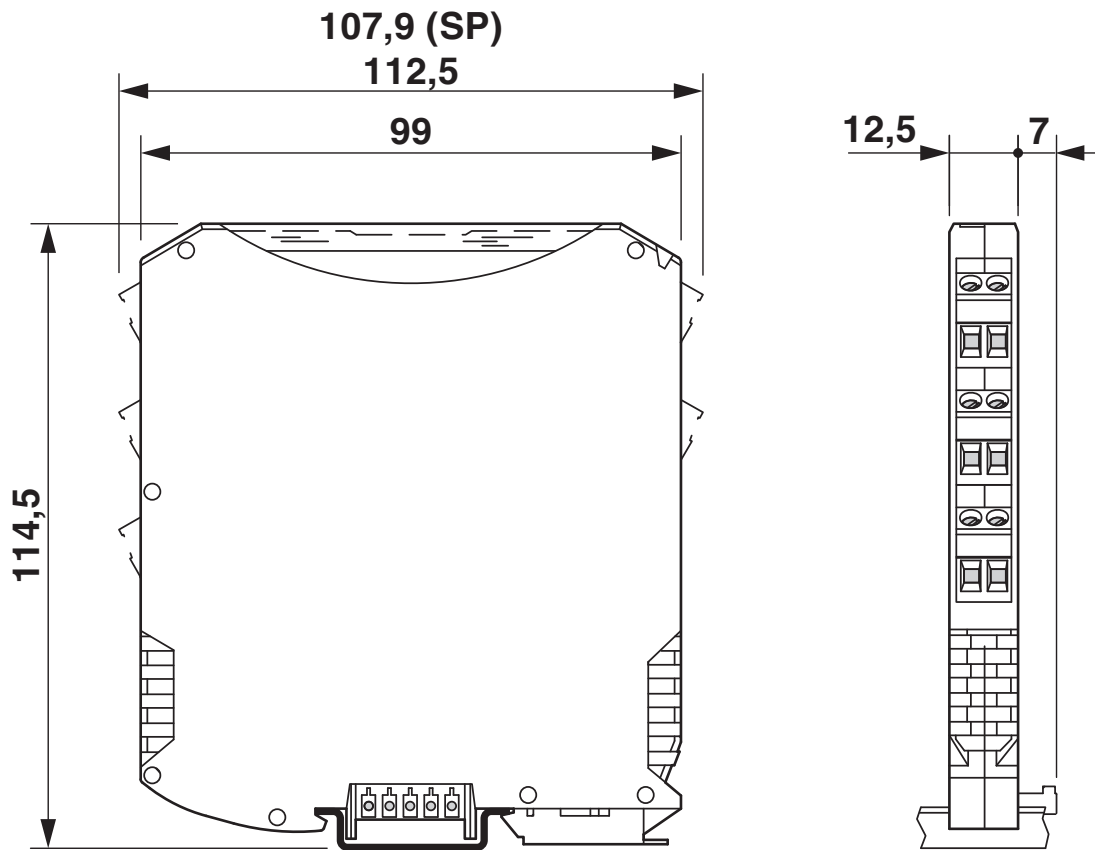
# MACX MCR-UI-UI-UP-NC - Signal conditioner



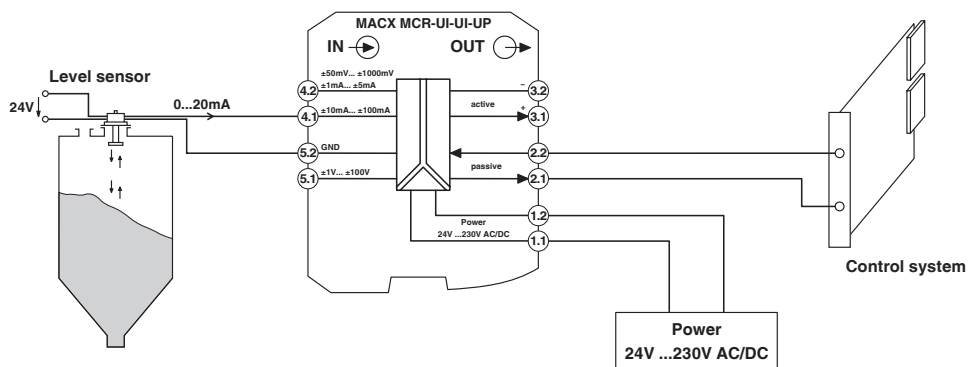
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Dimensional drawing



Application drawing



Level measurement with analog input terminals (active input card)

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2811297>



**DNV GL**

Approval ID: TAA00000AG



**UL Listed**

Approval ID: FILE E 330267



**cUL Listed**

Approval ID: FILE E 330267

**Functional Safety**

Approval ID: BVS Pb 02/09



**EAC Ex**

Approval ID: TP012 103.01 00078



**cUL Listed**

Approval ID: FILE E 199827



**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

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**cULus Listed**

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## Classifications

### ECLASS

ECLASS-11.0	27210120
ECLASS-12.0	27210120
ECLASS-13.0	27210120

### ETIM

ETIM 8.0	EC002653
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### UNSPSC

UNSPSC 21.0	39121000
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	15, 15(a), 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)
SCIP	a363c996-4e34-492c-94cf-5cd6c910a825

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