

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

Product Features

- Over 1600 signal conversions can be set via DIP switches on the front
- Up to SIL 2 according to 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



Key Commercial Data

Packing unit	1 pc
Weight per Piece (excluding packing)	160.0 g
Custom tariff number	85437090
Country of origin	Germany

Technical data

Note

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

Dimensions

Width	12.5 mm
Height	99 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

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
	-75 mV ... 75 mV
	-100 mV ... 100 mV
	-120 mV ... 120 mV
	-150 mV ... 150 mV

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Input data

	-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 ... 0.001 A (Configurable via DIP switches)
	0 mA ... 0.0015 A
	0 mA ... 0.002 A
	0 mA ... 0.003 A
	0 mA ... 0.005 A
	0 mA ... 0.01 A
	0 mA ... 0.015 A
	0 mA ... 0.02 A
	0 mA ... 0.03 A
	0 mA ... 0.05 A
	0 mA ... 0.1 A
	-1 mA ... 0.001 A
	-1.5 mA ... 0.0015 A
	-2 mA ... 0.002 A
	-3 mA ... 0.003 A
	-5 mA ... 0.005 A
	-10 mA ... 0.01 A
	-15 mA ... 0.015 A
	-20 mA ... 0.02 A
	-30 mA ... 0.03 A
	-50 mA ... 0.05 A

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Input data

	-100 mA ... 0.1 A
	1 mA ... 0.005 A
	2 mA ... 0.01 A
	4 mA ... 0.02 A
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 ... 0.005 A
	0 mA ... 0.01 A
	0 mA ... 0.02 A (Configurable via DIP switches)
	1 mA ... 0.005 A
	2 mA ... 0.01 A
	4 mA ... 0.02 A
	-5 mA ... 0.005 A
	-10 mA ... 0.01 A
	-20 mA ... 0.02 A
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 _{outmax}

Power supply

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

Connection method	Screw connection
Conductor cross section solid min.	0.2 mm ²
Conductor cross section solid max.	2.5 mm ²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	14
Conductor cross section flexible min.	0.2 mm ²
Conductor cross section flexible max.	2.5 mm ²
Stripping length	8 mm
Screw thread	M3
Connection method	COMBICON

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) 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 2004/108/EC
Noise immunity	EN 61000-6-2 When being exposed to interference, there may be minimal deviations.
Color	green
Housing material	PA 66-FR
Mounting position	any
Conformance	CE-compliant
ATEX	# II 3 G Ex nA IIC T4 Gc
IECEX	Ex nA IIC T4 Gc
UL, USA / Canada	UL 61010 Listed
	Class I, Div. 2, Groups A, B, C, D T6
	Class I, Zone 2, Group IIC
Functional Safety (SIL)	SIL 2

Safety characteristic data

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Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Designation	Input isolator (live zero signals)
Architecture	Single-channel, 1oo1
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	85.9 %
MTBF	231 Years
λ_{SU}	3.7×10^{-7} (370 FIT)
λ_{SD}	0
λ_{DU}	6×10^{-8} (60 FIT)
λ_{DD}	0
Probability of a hazardous failure on demand (PFD _{AVG})	2.7×10^{-4} (1 year)
Diagnostic coverage (DC)	0 %
Integrity requirement	IEC 61508 - Low demand
Designation	Output isolator (live zero signals)
Architecture	Single-channel, 1oo1
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	82.7 %
MTBF	233 Years
λ_{SU}	3.5×10^{-7} (350 FIT)
λ_{SD}	0
λ_{DU}	7.3×10^{-8} (73 FIT)
λ_{DD}	0
Probability of a hazardous failure on demand (PFD _{AVG})	3.2×10^{-4} (1 year)
Diagnostic coverage (DC)	0 %
Integrity requirement	IEC 61508 - High demand
Designation	Input isolator (live zero signals)
Architecture	Single-channel, 1oo1
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	85.9 %
MTBF	231 Years
λ_{SU}	3.7×10^{-7} (370 FIT)
λ_{SD}	0
λ_{DU}	5.97×10^{-8} (59.7 FIT)

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Technical data

Safety characteristic data

λ_{DD}	0
Probability of a hazardous failure per hour (PFH _D)	6.0×10^{-8}
Diagnostic coverage (DC)	0 %
Integrity requirement	IEC 61508 - High demand
Designation	Output isolator (live zero signals)
Architecture	Single-channel, 1oo1
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	82.7 %
MTBF	233 Years
λ_{SU}	3.5×10^{-7} (350 FIT)
λ_{SD}	0
λ_{DU}	7.3×10^{-8} (73 FIT)
λ_{DD}	0
Probability of a hazardous failure per hour (PFH _D)	7.3×10^{-8}
Diagnostic coverage (DC)	0 %

Standards and Regulations

Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Conformance	CE-compliant
ATEX	# II 3 G Ex nA IIC T4 Gc
IECEX	Ex nA IIC T4 Gc
UL, USA / Canada	UL 61010 Listed
	Class I, Div. 2, Groups A, B, C, D T6
	Class I, Zone 2, Group IIC

Classifications

eCl@ss

eCl@ss 4.0	27210120
eCl@ss 4.1	27210120
eCl@ss 5.0	27210120
eCl@ss 5.1	27210120
eCl@ss 6.0	27210120
eCl@ss 7.0	27210120
eCl@ss 8.0	27210120

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Classifications

ETIM

ETIM 2.0	EC001485
ETIM 3.0	EC001485
ETIM 4.0	EC002653
ETIM 5.0	EC002653

UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008

Approvals

Approvals

Approvals

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

Ex Approvals

IECEx / ATEX / UL Listed / cUL Listed / cULus Listed

Approvals submitted

Approval details

UL Listed

cUL Listed

GL

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Approvals

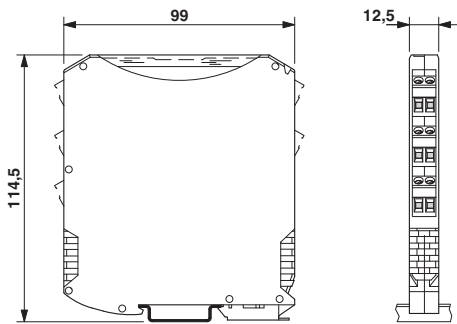
Functional Safety

EAC

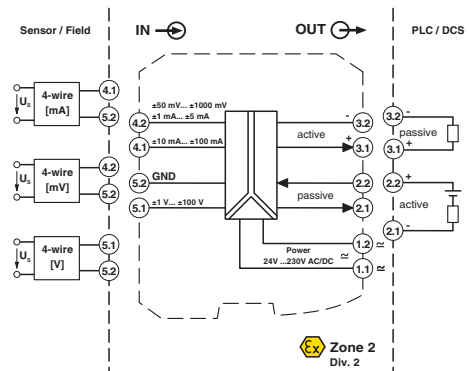
cULus Listed

Drawings

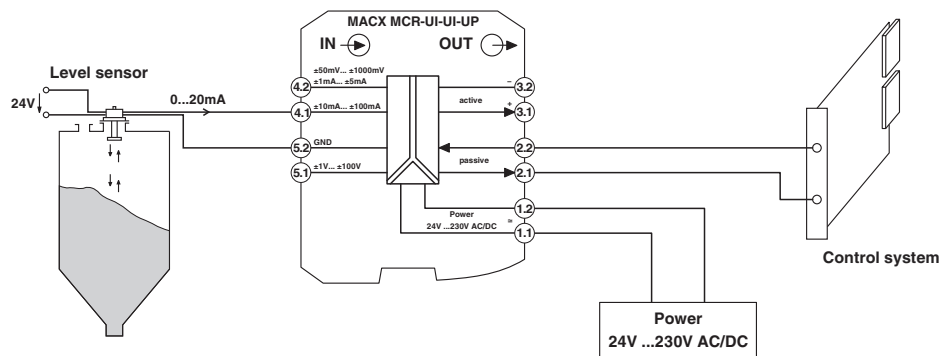
Dimensional drawing



Block diagram



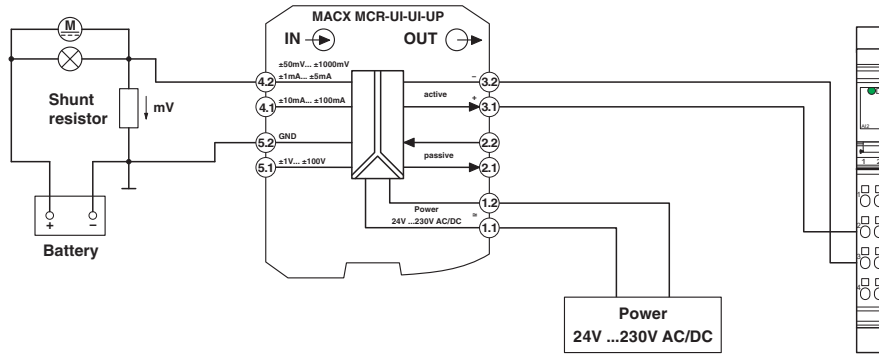
Application drawing



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)