

## Power/input isolating amplifier - MACX MCR-EX-SL-RPSSI-I - 2865340

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Ex-i repeater power supply and input signal conditioner, HART. Sends fed or active 0/4-20 mA signals from the Ex area to a load (active or passive) to the safe area. Electrical 3-way isolation, SIL 2 in accordance with IEC 61508.

### Product Features

- ✓ Power supply possible via DIN rail connector
- ✓ Up to SIL 2 according to EN 61508
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ 0/4 ... 20 mA input, [Ex ia] IIC (powered or not powered)
- ✓ 3-way electrical isolation
- ✓ Terminal point with 250 Ω resistor to increase HART impedance for low-resistance systems
- ✓ Plug-in screw or spring-cage connection technology (Push-in technology), with integrated sockets for HART communicators
- ✓ Bidirectional transmission of digital HART communication signals
- ✓ 0/4 ... 20 mA output (active or passive)



### Key commercial data

Packing unit	1 PCE
Catalog page	Page 440 (IF-2011)
GTIN	 4 046356 160353
Custom tariff number	85437090
Country of origin	GERMANY

### Technical data

Note:

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## Technical data

### Note:

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

Current input signal	0 mA ... 20 mA
Current input signal	4 mA ... 20 mA
Transmitter supply voltage	> 16 V (at 20 mA)
Voltage drop	< 3.5 V (in input isolating amplifier operation)

### Output data

Signal output	Current output
Current output signal	0 mA ... 20 mA (active)
Current output signal	4 mA ... 20 mA (active)
Current output signal	0 mA ... 20 mA (14 ... 26 V ext. source voltage)
Current output signal	4 mA ... 20 mA (14 ... 26 V ext. source voltage)
Transmission Behavior	1:1 to input signal
Load/output load current output	< 600 Ω
Output ripple	< 20 mV <sub>rms</sub>

### Power supply

Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC
Max. current consumption	< 60 mA (at 24 V DC)
Power consumption	< 1.1 W (at 24 V DC / 20 mA)

### Connection data

Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	2.5 mm <sup>2</sup>
Conductor cross section stranded min.	0.2 mm <sup>2</sup>
Conductor cross section stranded max.	2.5 mm <sup>2</sup>
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	14
Stripping length	7 mm
Screw thread	M3
Connection method	Screw connection
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

### General data

No. of channels	1
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### General data

Maximum transmission error	< 0.1 % (of final value)
Transmission error, typical	< 0.05 % (of final value)
Maximum temperature coefficient	< 0.01 %/K
Ambient temperature (operation)	-20 °C ... 60 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Permissible humidity (operation)	10 % ... 95 % (no condensation)
Step response (10-90%)	< 600 µs (for 4 mA ... 20 mA step)
Status display	Green LED (supply voltage)
Width	12.5 mm
Height	99 mm
Depth	114.5 mm
Inflammability class according to UL 94	V0
Pollution degree	2
Surge voltage category	II
Noise immunity	EN 61000-6-2 When being exposed to interference, there may be minimal deviations.
Housing material	PA 66-FR
Degree of protection	IP20
Color	green
Electrical isolation input / output / supply	2.5 kV (50 Hz, 1 min., test voltage)
Electrical isolation input / output	375 V (Peak value in accordance with EN 60079-11)
Electrical isolation input / supply	375 V (Peak value in accordance with EN 60079-11)
Conformance	CE-compliant, additionally EN 61326
ATEX	# II (1)G [Ex ia] IIC/IIB
ATEX	# II (1) D [Ex iaD]
ATEX	# II 3 (1)G Ex nA [ia] IIC/IIB T4
IECEX	[Ex ia] IIC/IIB; [Ex iaD]; Ex nA [ia] IIC/IIB T4
UL, USA / Canada	Class I Div 2; IS for Class I, II, III Div 1
Functional safety (SIL)	SIL 2 according to EN 61508

### Data communication (bypass)

HART function	Yes
Protocols supported	HART

### Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	90.7 %

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### Technical data

#### Safety characteristic data

$\lambda_{SU}$	$4.867 \times 10^{-7}$ (486.7 FIT)
$\lambda_{SD}$	0
$\lambda_{DU}$	$5 \times 10^{-8}$ (50 FIT)
$\lambda_{DD}$	0
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	$2.19 \times 10^{-4}$ (1 year)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	$8.76 \times 10^{-4}$ ( years)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	$1.1 \times 10^{-3}$ (5 years)
Diagnostic coverage (DC)	(DC <sub>S</sub> = 0%, DC <sub>D</sub> = 0%)
Integrity requirement	IEC 61508 - High demand
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	90.7 %
$\lambda_{SU}$	$4.867 \times 10^{-7}$ (486.7 FIT)
$\lambda_{SD}$	0
$\lambda_{DU}$	$5 \times 10^{-8}$ (50 FIT)
$\lambda_{DD}$	0
Probability of a hazardous failure per hour (PFH <sub>D</sub> )	$4,99 \times 10^{-8}$
Diagnostic coverage (DC)	(DC <sub>S</sub> = 0%, DC <sub>D</sub> = 0%)

#### Safety data

Max. voltage U <sub>o</sub>	25.2 V
Max. current I <sub>o</sub>	93 mA
Max. power P <sub>o</sub>	587 mW
Gas group	II C
Max. external inductivity L <sub>o</sub>	2 mH
Max. external capacity C <sub>o</sub>	107 nF
Safety-related maximum voltage U <sub>m</sub>	253 V AC (125 V DC)
Max. voltage U <sub>i</sub>	30 V
Max. current I <sub>i</sub>	130 mA
Max. inductance L <sub>i</sub>	Negligible
Max. capacitance C <sub>i</sub>	Negligible

#### EMC data

Name	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
Typical deviation from the measuring range final value	1 %
Name	Fast transients (burst)

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## Technical data

### EMC data

Standards/regulations	EN 61000-4-4
Typical deviation from the measuring range final value	1 %
Name	Conducted interferences
Standards/regulations	EN 61000-4-6

## Classifications

### ETIM

ETIM 2.0	EC001431
ETIM 3.0	EC001596
ETIM 4.0	EC002653
ETIM 5.0	EC002653

### UNSPSC

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

### eCl@ss

eCl@ss 4.0	27210121
eCl@ss 4.1	27210121
eCl@ss 5.0	27210121
eCl@ss 5.1	27210121
eCl@ss 6.0	27210120
eCl@ss 7.0	27210120

## Approvals

### Approvals

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#### Approvals

UL Listed / cUL Listed / Functional Safety / cULus Listed

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#### Ex Approvals

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

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## Approvals

Approvals submitted

GL

## Approval details

UL Listed

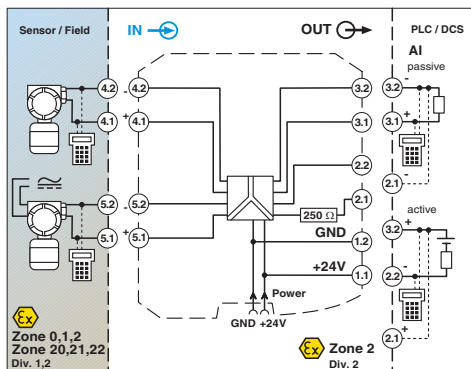
cUL Listed

Functional Safety

cULus Listed

## Drawings

Block diagram



Dimensioned drawing

