

Power/input isolating amplifier - MACX MCR-EX-SL-RPSSI-I-SP - 2924016

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Ex i repeater power supply and input signal conditioner, HART. Transmits supplied or active 0/4 - 20 mA signals from the hazardous area to a load (active or passive) in the safe area. 3-way electrical isolation; SIL 2 according to IEC 61508, with push-in connection

The illustration shows the versions with screw connection

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 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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Power/input isolating amplifier - MACX MCR-EX-SL-RPSSI-I-SP - 2924016

Technical data

Dimensions

Width	12.5 mm
Height	116 mm
Depth	114.5 mm

Ambient conditions

Ambient temperature (operation)	-20 °C ... 60 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Noise immunity	EN 61000-6-2 When being exposed to interference, there may be minimal deviations.
Degree of protection	IP20

Input data

Signal input	Active current input, intrinsically safe
Current input signal	4 mA ... 20 mA
Transmitter supply voltage	> 16 V (20 mA)
	> 15.3 V (22.5 mA)
Polarization and surge protection	Yes
Signal input	Passive current input, intrinsically safe
Current input signal	0 mA ... 20 mA
	4 mA ... 20 mA
Voltage drop	< 3.5 V

Output data

Signal output	Current output (active and passive)
Current output signal	4 mA ... 20 mA (active)
	4 mA ... 20 mA (14 ... 26 V ext. source voltage)
Transmission Behavior	1:1 to input signal
Load/output load current output	< 1000 Ω (20 mA)
	< 825 Ω (24 mA)
Output ripple	< 20 mV _{rms}
Output behavior in the event of an error	0 mA (Cable break in the input)
	≥ 22.5 mA (Cable short-circuit in the input)
Signal output	Current output (active and passive)
Current output signal	0 mA ... 20 mA (active)
	4 mA ... 20 mA (active)
	0 mA ... 20 mA (14 ... 26 V ext. source voltage)
	4 mA ... 20 mA (14 ... 26 V ext. source voltage)

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Technical data

Output data

Transmission Behavior	1:1 to input signal
Load/output load current output	< 1000 Ω (20 mA)
	< 825 Ω (24 mA)
Output ripple	< 20 mV _{rms}
Output behavior in the event of an error	0 mA (Cable break in the input)
	0 mA (Cable short-circuit in the input)

Power supply

Designation	Repeater power supply operation
Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Max. current consumption	< 76 mA (24 V DC / 20 mA / 1000 #)
Power consumption	< 1.1 W (24 V DC / 20 mA / 1000 #)
	< 1.8 W (20 mA / 1000 #)

Connection data

Conductor cross section solid min.	0.2 mm ²
Conductor cross section solid max.	1.5 mm ²
Conductor cross section flexible min.	0.2 mm ²
Conductor cross section flexible max.	1.5 mm ²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	16
Stripping length	8 mm
Connection method	Push-in connection

General

No. of channels	1
Maximum transmission error	< 0.1 % (of final value)
Transmission error, typical	< 0.05 % (of final value)
Maximum temperature coefficient	< 0.01 %/K
Temperature coefficient, typical	< 0.004 %/K
Step response (10-90%)	< 200 μs (for jump 4 mA ... 20 mA, load 600)
	< 600 μs (for jump 0 mA ... 20 mA, load 600)
Status display	Green LED (supply voltage)
Flammability rating according to UL 94	V0
Degree of pollution	2
Overvoltage category	II
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Housing material	PA 66-FR

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Technical data

General

Color	green
Designation	Input/output/power supply
Electrical isolation	300 V _{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 2, safe isolation as per EN 61010-1))
	2.5 kV (50 Hz, 1 min., test voltage)
Designation	Input/output
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Designation	Input/power supply
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Conformance	CE-compliant, additionally EN 61326
ATEX	# II (1) G [Ex ia Ga] IIC/IIB
	# II (1) D [Ex ia Da] IIIC
	# II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc
	# I (M1) [Ex ia Ma] I
IECEX	[Ex ia Ga] IIC/IIB
	[Ex ia Da] IIIC
	Ex nA [ia Ga] IIC/IIB T4 Gc
	[Ex ia Ma] I
UL, USA / Canada	UL 61010 Listed
	Class I Div 2; IS for Class I, II, III Div 1
Functional Safety (SIL)	SIL 2

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 %
λ_{SU}	4.867×10^{-7} (486.7 FIT)
λ_{SD}	0
λ_{DU}	5×10^{-8} (50 FIT)
λ_{DD}	0
Probability of a hazardous failure on demand (PFD _{AVG})	2.19×10^{-4} (1 year)
	8.76×10^{-4} (years)
	1.1×10^{-3} (5 years)

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Technical data

Safety characteristic data

Diagnostic coverage (DC)	DC _S = 0%, DC _D = 0%
Integrity requirement	IEC 61508 - High demand
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	90.7 %
λ_{SU}	4.867×10^{-7} (486.7 FIT)
λ_{DU}	5×10^{-8} (50 FIT)
λ_{DD}	0
Probability of a hazardous failure per hour (PFH _D)	$4,99 \times 10^{-8}$
Diagnostic coverage (DC)	DC _S = 0%, DC _D = 0%

Safety data

Operation	Repeater power supply operation
Max. output voltage U _o	25.2 V
Max. output current I _o	93 mA
Max. output power P _o	587 mW
Group	IIC
Max. external inductivity L _o	2 mH
Max. external capacity C _o	107 nF
Group	IIB
Max. external inductivity L _o	4 mH
Max. external capacity C _o	820 nF
Safety-related maximum voltage U _m	253 V AC (125 V DC)
Operation	Signal conditioner operation
Input voltage U _i	≤ 30 V
Input current I _i	≤ 150 mA
Max. internal inductance L _i	negligible
Max. internal capacitance C _i	negligible

EMC data

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

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Technical data

EMC data

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

Standards and Regulations

Order No.	2924016
Product key	CK3111
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
	EN 61000-4-4
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Flammability rating according to UL 94	V0
Conformance	CE-compliant, additionally EN 61326
ATEX	# II (1) G [Ex ia Ga] IIC/IIB
	# II (1) D [Ex ia Da] IIIC
	# II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc
	# I (M1) [Ex ia Ma] I
IECEX	[Ex ia Ga] IIC/IIB
	[Ex ia Da] IIIC
	Ex nA [ia Ga] IIC/IIB T4 Gc
	[Ex ia Ma] I
UL, USA / Canada	UL 61010 Listed
	Class I Div 2; IS for Class I, II, III Div 1
Group	IIC
	IIB

Classifications

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	27210121
eCl@ss 7.0	27210121
eCl@ss 8.0	27210120

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Classifications

ETIM

ETIM 2.0	EC001431
ETIM 3.0	EC001596
ETIM 4.0	EC001596
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 / Functional Safety / GL / EAC / BV / cULus Listed

Ex Approvals

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

Approvals submitted

Approval details

UL Listed

cUL Listed

Functional Safety

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Approvals

GL

EAC

BV

cULus Listed

Accessories

Accessories

DIN rail connector

DIN rail connector - ME 6,2 TBUS-2 1,5/5-ST-3,81 GN - 2869728



DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

Power module

Power and error message module - MACX MCR-PTB - 2865625



Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GN DIN rail connector

Power and error message module - MACX MCR-PTB-SP - 2924184

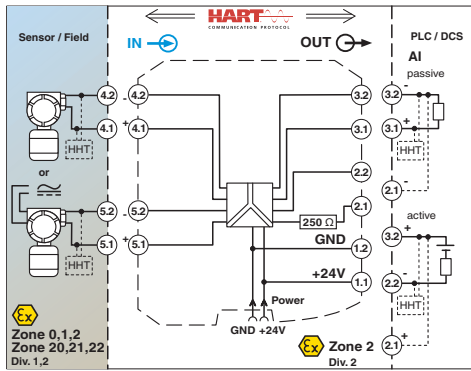


Power and fault signaling module with push-in connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GN DIN rail connector

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Drawings

Block diagram



Dimensional drawing

