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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

Why buy this product

- 0/4 mA ... 20 mA input, intrinsically safe, [Ex ia], powered and not powered
- Measuring transducer supply voltage > 16 V
- 0/4 mA ... 20 mA output, active up to 1000 # load or passive
- Bidirectional HART signal transmission
- Error indication according to NAMUR NE 43
- SIL 2 according to IEC 61508/EN 61508
- Installation in Ex zone 2 permitted
- 3-way electrical isolation
- Power supply possible via DIN rail connector
- Plug-in connection terminals, push-in connection technology
- Design width of just 12.5 mm
- Minimal power dissipation
- High transmission accuracy



Key Commercial Data

Packing unit	1 STK
GTIN	 4 046356 338066

Technical data

Note

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

Technical data

Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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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 ... 0.02 A
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 ... 0.02 A
	4 mA ... 0.02 A
Voltage drop	< 3.5 V

Output data

Signal output	Current output (active and passive)
Current output signal	4 mA ... 0.02 A (active)
	4 mA ... 0.02 A (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 ... 0.02 A (active)
	4 mA ... 0.02 A (active)
	0 mA ... 0.02 A (14 ... 26 V ext. source voltage)

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Technical data

Output data

	4 mA ... 0.02 A (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)
	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
Color	green

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General

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})	2.40×10^{-4} (1 year)
	4.76×10^{-4} (2 years)
	7.13×10^{-4} (3 years)
	9.50×10^{-4} (4 years)
	11.9×10^{-4} (5 years)
Diagnostic coverage (DC)	DC _S = 0%, DC _D = 0%

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Technical data

Safety characteristic data

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

Standards and Regulations

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Technical data

Standards and Regulations

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

ETIM

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

UNSPSC

UNSPSC 6.01	30211506
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Classifications

UNSPSC

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

GL

EAC

BV

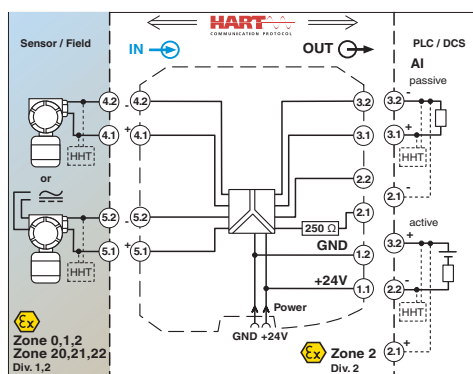
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Approvals

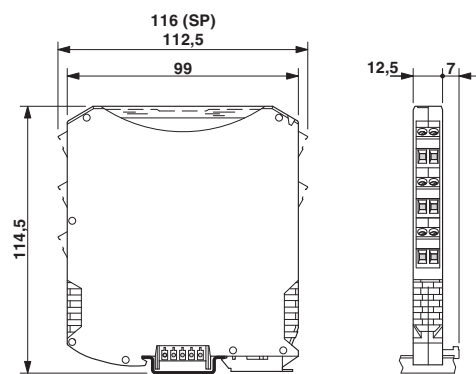


Drawings

Block diagram



Dimensional drawing



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