

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

Your advantages

- ✓ 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
- ✓ Housing width: 12.5 mm
- ✓ Minimal power dissipation
- ✓ High transmission accuracy



Key Commercial Data

Packing unit	1 pc
GTIN	 4 046356 338066
GTIN	4046356338066

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	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)
Degree of protection	IP20
Noise immunity	EN 61000-6-2 When being exposed to interference, there may be minimal deviations.

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)
Underload/overload signal range	0 mA ... 24 mA (Extended transmission range for diagnostics)
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 (in input isolating amplifier operation)
Underload/overload signal range	0 mA ... 24 mA (Extended transmission range for diagnostics)

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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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 dissipation	< 1.1 W (24 V DC / 20 mA / 1000 #)
Power consumption	< 1.8 W (20 mA / 1000 #)
Designation	Signal conditioner 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	< 44 mA (24 V DC / 20 mA / 1000 #)
Power dissipation	< 0.75 W (24 V DC / 20 mA / 1000 #)

Connection data

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

Connection data 2

Connection name	Test socket
Max. diameter	2 mm

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 Ω)
	< 600 μs (for jump 0 mA ... 20 mA, load 600 Ω)
Status display	Green LED (supply voltage)
Flammability rating according to UL 94	V0
Degree of pollution	2

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Technical data

General

Overvoltage category	II
Electromagnetic compatibility	Conformance with EMC directive
Interference emission	EN 61000-6-4
Housing material	PA 6.6-FR
Color	gray
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
	# II (1) D [Ex ia Da] IIIC
	# II 3 (1) G Ex nA [ia Ga] IIC T4 Gc
	# I (M1) [Ex ia Ma] I
IECEX	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA [ia Ga] IIC T4 Gc
	[Ex ia Ma] I
UL, USA/Canada	UL 61010 Listed
	Class I Div 2; IS for Class I, II, III Div 1
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)	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)

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Technical data

Safety characteristic data

	4.76 x 10 ⁻⁴ (2 years)
	7.13 x 10 ⁻⁴ (3 years)
	9.50 x 10 ⁻⁴ (4 years)
	11.9 x 10 ⁻⁴ (5 years)
Diagnostic coverage (DC)	DC _S =0 %, DC _D =0 %
Integrity requirement	IEC 61508 - High demand
Equipment type	Type A
Safety Integrity Level (SIL)	2
Safe Failure Fraction (SFF)	90.7 %
λ _{SU}	4.867 x 10 ⁻⁷ (486.7 FIT)
λ _{DU}	5 x 10 ⁻⁸ (50 FIT)
λ _{DD}	0
Probability of a hazardous failure per hour (PFH _D)	4,99 x 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

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Technical data

EMC data

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

Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4
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
	# II (1) D [Ex ia Da] IIIC
	# II 3 (1) G Ex nA [ia Ga] IIC T4 Gc
	# I (M1) [Ex ia Ma] I
IECEX	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA [ia Ga] IIC T4 Gc
	[Ex ia Ma] I
UL, USA/Canada	UL 61010 Listed
	Class I Div 2; IS for Class I, II, III Div 1
DNV GL-Temperature	B
DNV GL-Humidity	B
DNV GL-Vibration	A
DNV GL-EMC	A
DNV GL-Enclosure	Required protection according to the Rules shall be provided upon installation on board
Group	IIC
	IIB

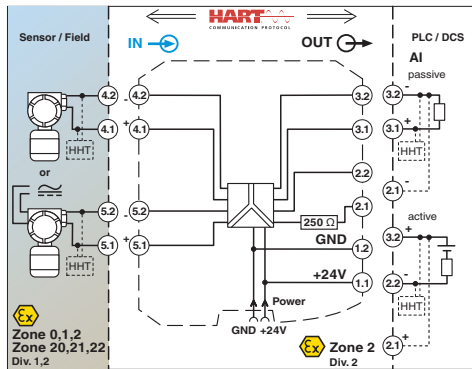
Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

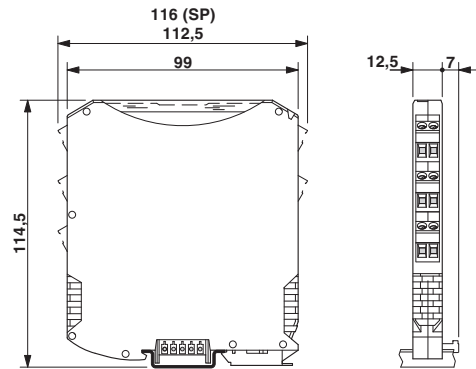
Drawings

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

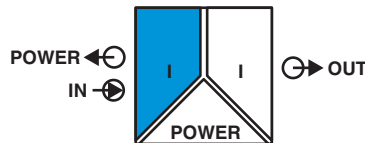
Block diagram



Dimensional drawing



Pictogram



Approvals

Approvals

Approvals

BV / UL Listed / cUL Listed / Functional Safety / DNV GL / cULus Listed

Ex Approvals

KC-s / IECEx / ATEX / UL Listed / cUL Listed / EAC Ex / cULus Listed

Approval details

BV		http://www.veristar.com/portal/veristarinfo/generalinfo/approved/approvedProducts/equipmentAndMaterials	39933/A0_BV
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Approvals

UL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 330267
cUL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 330267
Functional Safety			BVS Pb 03/08
DNV GL		https://approvalfinder.dnvgl.com/	TAA000020C
cULus Listed			

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