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. 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 screw 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 zone 2, protection type "ec" (EN 60079-7) permitted
- 3-way electrical isolation
- Power supply possible via DIN rail connector
- Plug-in connection terminal blocks, screw connection technology, with integrated sockets for HART communicators
- Housing width: 12.5 mm
- Minimal power dissipation
- High transmission accuracy

Key Commercial Data

Packing unit	1 pc
GTIN	4 046356 160353
GTIN	4046356160353
Weight per Piece (excluding packing)	170.000 g
Custom tariff number	85437090
Country of origin	Germany

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Technical data

Note

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

Dimensions

Width	12.5 mm
Height	112.5 mm
Depth	113.7 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 (not assessed by UL)
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)

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Output data

	≥ 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)
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 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	Screw connection
Stripping length	7 mm
Screw thread	M3
Conductor cross section solid	0.2 mm² ... 2.5 mm²
Conductor cross section flexible	0.2 mm² ... 2.5 mm²
Conductor cross section AWG	24 ... 14
Torque	0.5 Nm ... 0.6 Nm

Connection data 2

Connection name	Test socket
Max. diameter	2 mm

General

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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)
Degree of pollution	2
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

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Technical data

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 x 10^{-7} (486.7 FIT)
λ_{SD}	0
λ_{DU}	5 x 10^{-8} (50 FIT)
λ_{DD}	0
Probability of a hazardous failure on demand (PFD_{AVG})	2.40 x 10^{-4} (1 year)
	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_{SD}	0
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 capacitance C_o	107 nF
Group	IIB
Max. external inductivity L_o	4 mH
Max. external capacitance C_o	820 nF

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Safety data

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
Safety-related maximum voltage U_m	253 V AC (125 V DC)

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

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
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

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Technical data

Standards and Regulations

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

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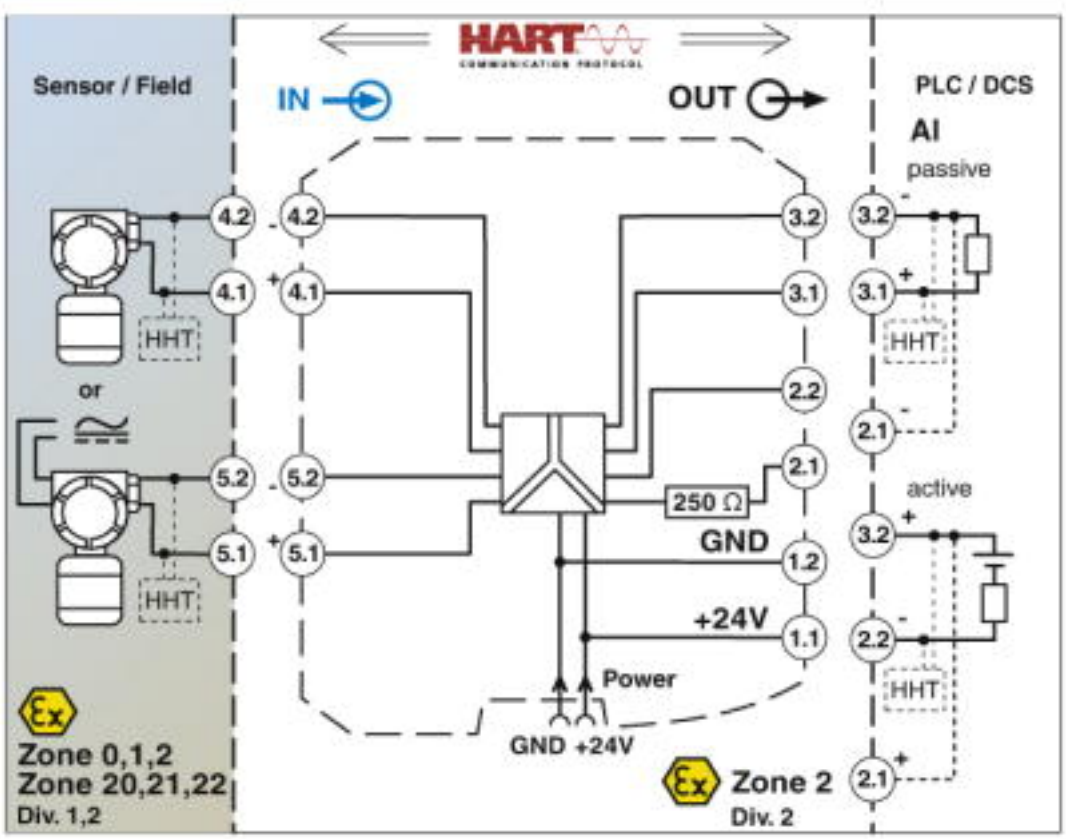
Block diagram



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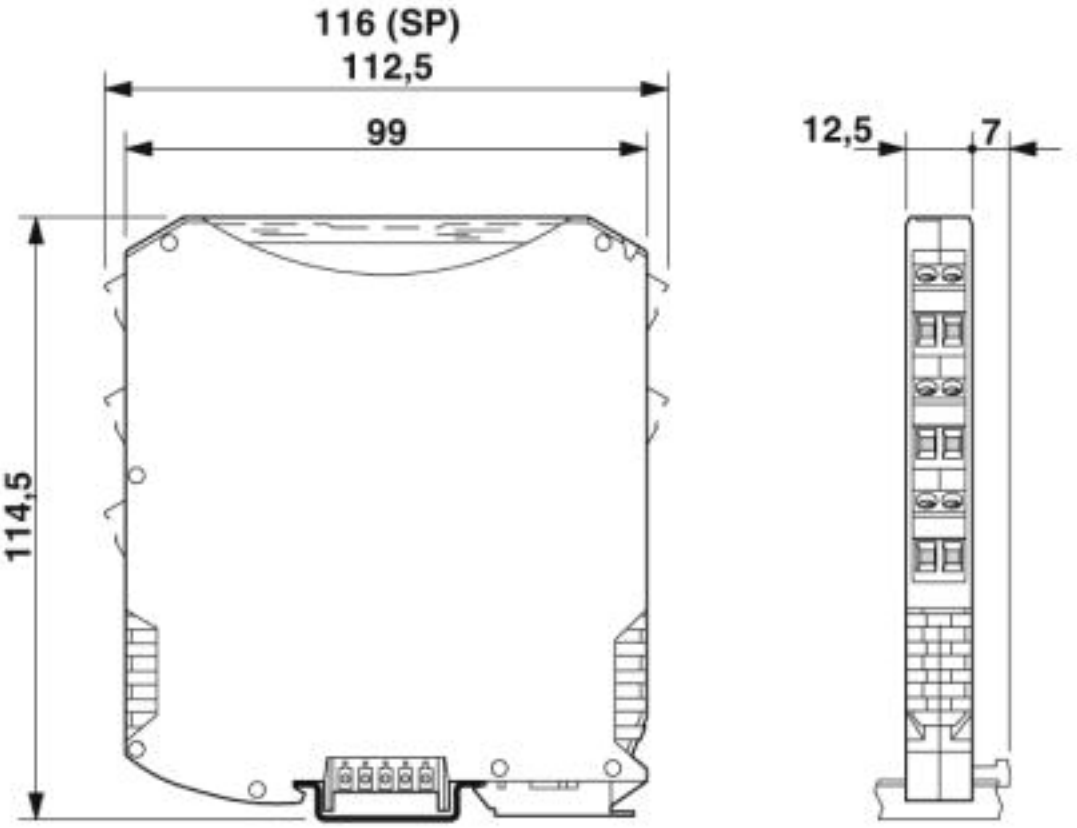
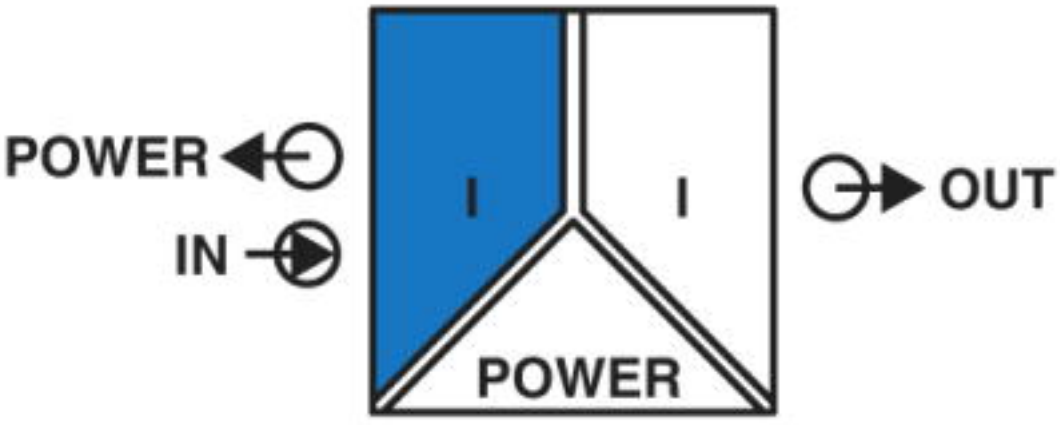
Dimensional drawing



Pictogram



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Classifications

eCl@ss

eCl@ss 4.0	27210100
eCl@ss 4.1	27210100
eCl@ss 5.0	27210100
eCl@ss 5.1	27210100
eCl@ss 6.0	27210100
eCl@ss 7.0	27210120
eCl@ss 8.0	27210120
eCl@ss 9.0	27210120

ETIM

ETIM 4.0	EC002653
ETIM 5.0	EC002653
ETIM 6.0	EC002653
ETIM 7.0	EC002653

UNSPSC

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

Approvals

Approvals

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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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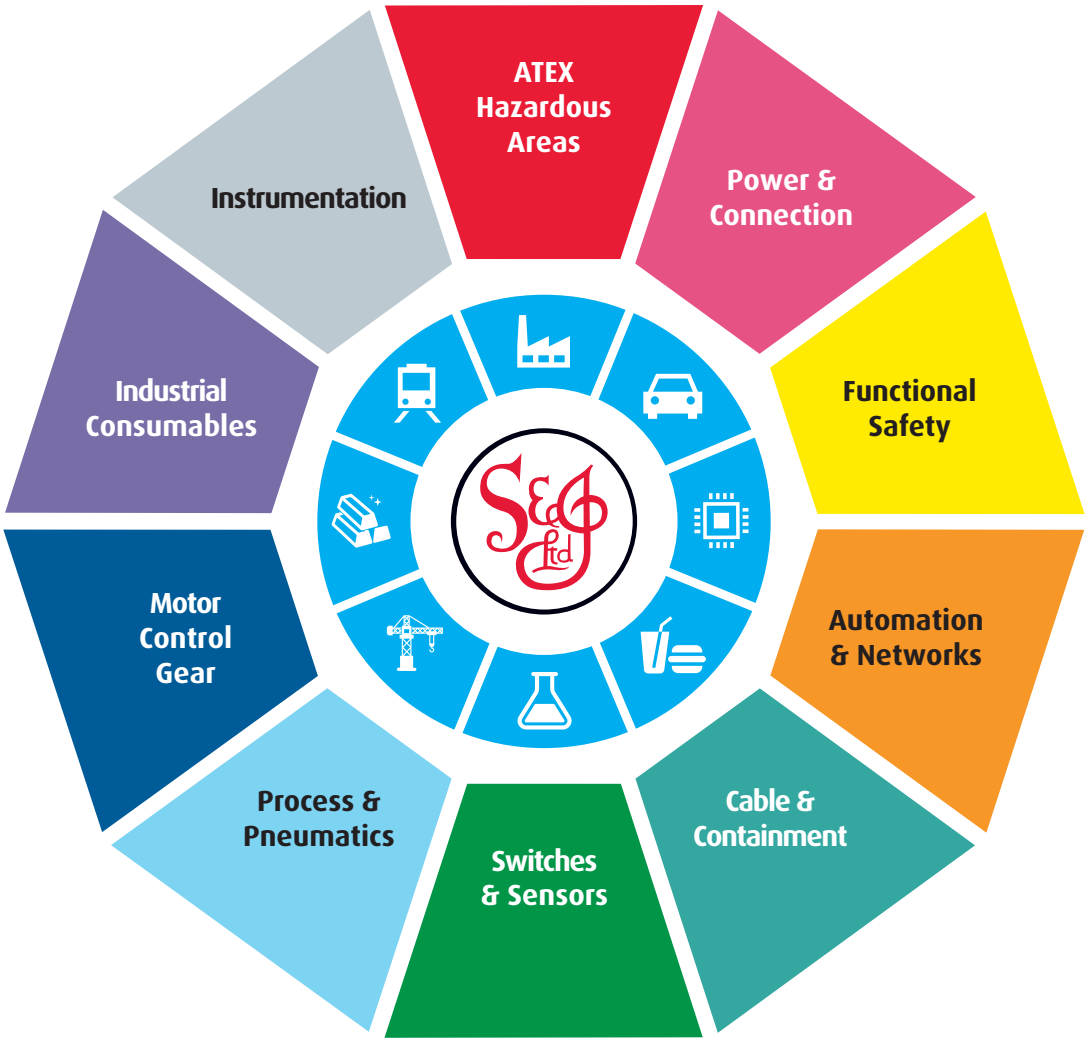

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