Output signal conditioner - MACX MCR-EX-SL-IDSI-I - 2865405

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Ex i output signal conditioner, HART Isolates and sends intrinsically safe 0/4-20 mA signals to a load (I/P converters, control valves, displays) in Ex areas. Electrical 3-way isolation, wire break recognition, 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
- Line fault detection (LFD)
- 3-way electrical isolation
- 0/4 ... 20 mA output, [Ex ia] IIC
- 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 input

Key Commercial Data

Packing unit	1 pc
Weight per Piece (excluding packing)	166.4 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

Dimensions

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Dimensions

Width	12.5 mm
Height	99 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

Current input signal	0 mA ... 20 mA
	4 mA ... 20 mA
Input voltage limitation	5.4 V (at 20 mA)
Input impedance	> 100 kΩ (If there is a line fault)

Output data

Signal output	Current output
Current output signal	0 mA ... 20 mA (intrinsically safe)
	4 mA ... 20 mA (intrinsically safe)
Transmission Behavior	1:1 to input signal
Load/output load current output	< 800 Ω (at 20 mA)
	< 730 Ω (at 22.5 mA)
Output ripple	< 20 mV_{rms}

Power supply

Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Max. current consumption	< 46 mA (at 24 V DC / 20 mA)
Power consumption	< 1.1 W (at 24 V DC / 20 mA)

Connection data

Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	2.5 mm²
Conductor cross section flexible min.	0.2 mm²
Conductor cross section flexible max.	2.5 mm²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	14

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Connection data

Stripping length	7 mm
Screw thread	M3
Connection method	Screw connection
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

General

No. of channels	1
Maximum transmission error	< 0.1 % (of final value)
Maximum temperature coefficient	< 0.01 %/K
Step response (10-90%)	< 140 µs (for 4 mA ... 20 mA step)
Status display	Green LED (supply voltage)
Flammability rating according to UL 94	V0
Degree of pollution	2
Overvoltage category	II
Emitted interference	EN 61000-6-4
Housing material	PA 66-FR
Color	green
Designation	Input/output/power supply
Electrical isolation	1.5 kV (50 Hz, 1 min., test voltage)
	300 V_{rms} (Rated insulation voltage (overvoltage category II, degree of pollution 2))
Designation	Output/input
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Designation	Output/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
IECEx	[Ex ia Ga] IIC/IIB
	[Ex ia Da] IIIC
	Ex nA [ia Ga] IIC/IIB T4 Gc
UL, USA / Canada	Class I Div 2; IS for Class I, II, III Div 1

Data communication (bypass)

HART function	Yes
Protocols supported	HART

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Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	94.68 %
λ_{SU}	4.965 x 10^{-7} (496.5 FIT)
λ_{SD}	0
λ_{DU}	2.79 x 10^{-8} (27.9 FIT)
λ_{DD}	0
Probability of a hazardous failure on demand (PFD_{AVG})	1.22 x 10^{-4} (1 year)
	6.1 x 10^{-4} (5 years)
	12.2 x 10^{-4} (10 years)
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)	94.68 %
λ_{SU}	4.965 x 10^{-7} (496.5 FIT)
λ_{SD}	0
λ_{DU}	2.79 x 10^{-8} (27.9 FIT)
λ_{DD}	0
Probability of a hazardous failure per hour (PFH_D)	2,79 x 10^{-8}
Diagnostic coverage (DC)	DC_S = 0%, DC_D = 0%

Safety data

Max. output voltage U_o	27.7 V
Max. output current I_o	92 mA
Max. output power P_o	633 mW
Group	IIC
Max. external inductivity L_o	2 mH
Max. external capacity C_o	85 nF
Group	IIB
Max. external inductivity L_o	4 mH
Max. external capacity C_o	663 nF
Safety-related maximum voltage U_m	253 V AC (125 V DC)

EMC data

Designation	Electromagnetic RF field

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Technical data

EMC data

Standards/regulations	EN 61000-4-3

Standards and Regulations

Noise emission	EN 61000-6-4
Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
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
IECEx	[Ex ia Ga] IIC/IIB
	[Ex ia Da] IIIC
	Ex nA [ia Ga] IIC/IIB T4 Gc
UL, USA / Canada	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	27210121

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

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Classifications

UNSPSC

UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008

Approvals

Approvals

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UL Listed / cUL Listed / Functional Safety / EAC / cULus Listed

Ex Approvals

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

Approvals submitted

Approval details

UL Listed

cUL Listed

Functional Safety

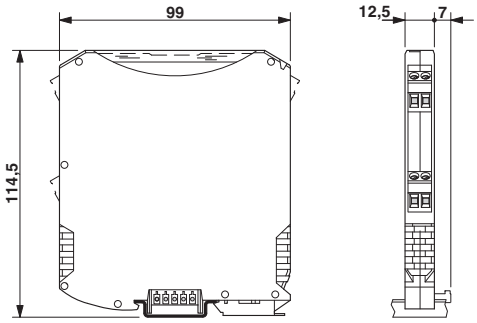
EAC

cULus Listed

Drawings

Output signal conditioner - MACX MCR-EX-SL-IDSI-I - 2865405

Dimensional drawing



Block diagram