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Especialistas en Automatización

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Output signal conditioner - MACX MCR-EX-SL-IDSII-SP - 2924032

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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, spring-cage connection.

The illustration shows the versions with screw connection

Why buy this product

- Power supply possible via DIN rail connector
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- Up to SIL 2 according to EN 61508
- Line fault detection (LFD)
- 0/4 ... 20 mA output, [Ex ia] IIC
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or spring-cage connection technology (Push-in technology), with integrated sockets for HART communicators
- 0/4 ... 20 mA input
- 3-way electrical isolation



Key Commercial Data

Packing unit	1 STK
GTIN	4 046356 337342

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	99 mm
Depth	114.5 mm

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Technical data

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 ... 0.02 A
	4 mA ... 0.02 A
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 ... 0.02 A (intrinsically safe)
	4 mA ... 0.02 A (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 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)
Maximum temperature coefficient	< 0.01 %/K
Step response (10-90%)	< 140 μs (for 4 mA ... 20 mA step)
Status display	Green LED (supply voltage)

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Technical data

General

Flammability rating according to UL 94	V0
Degree of pollution	2
Overvoltage category	II
Electromagnetic compatibility	Electromagnetic HF field
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

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}	4.965×10^{-7} (496.5 FIT)
λ_{SD}	0
λ_{DU}	2.79×10^{-8} (27.9 FIT)
λ_{DD}	0
Probability of a hazardous failure on demand (PFD _{AVG})	1.22×10^{-4} (1 year)
	6.1×10^{-4} (5 years)
	12.2×10^{-4} (10 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)	94.68 %
λ_{SU}	4.965×10^{-7} (496.5 FIT)
λ_{SD}	0
λ_{DU}	2.79×10^{-8} (27.9 FIT)
λ_{DD}	0
Probability of a hazardous failure per hour (PFH _D)	$2,79 \times 10^{-8}$
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
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	Electromagnetic HF field
Noise emission	EN 61000-6-4
Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
	EN 61000-4-4
Designation	Conducted interferences

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Technical data

Standards and Regulations

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
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
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008

Approvals

Approvals

Output signal conditioner - MACX MCR-EX-SL-IDS1-I-SP - 2924032

Approvals

Approvals


UL Listed / cUL Listed / GL / 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 

GL

Functional Safety

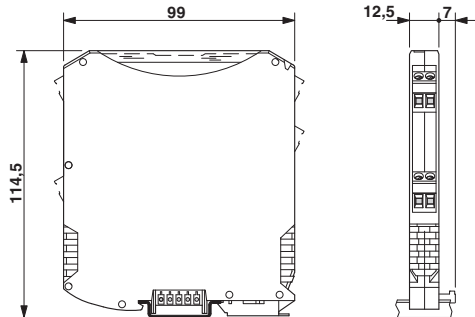
EAC

cULus Listed 

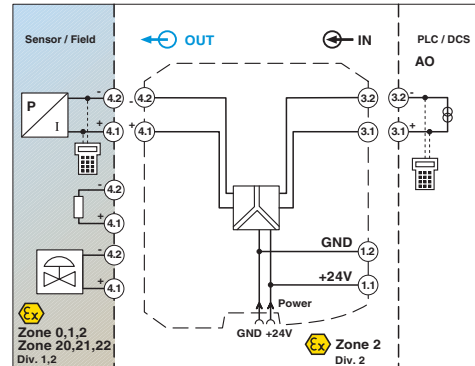
Drawings

Output signal conditioner - MACX MCR-EX-SL-IDS1-I-SP - 2924032

Dimensional drawing



Block diagram



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Product	Code	Reference	Product link
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