

Isolation amplifier - MACX MCR-EX-SL-NAM-R - 2865434

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Ex i NAMUR isolating amplifier For operating proximity sensors and switches in Ex areas. The signals are transmitted via a relay output (PDT contact) to the safe area. Line fault detection (LFD), 3-way isolation, SIL 2.

Product Features

- ✓ Power supply and error indication 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), can be activated/deactivated, error indicated by red flashing LED with de-excitation of output relay
- ✓ 3-way electrical isolation
- ✓ LED indicators for supply voltage, switching state, and malfunction according to NAMUR NE 44
- ✓ Relay signal output (PDT)
- ✓ Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia] IIC
- ✓ Direction of operation can be selected (operating or closed circuit current behavior)



Key Commercial Data

Packing unit	1 pc
Weight per Piece (excluding packing)	165.8 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
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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 ... 85 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Noise immunity	EN 61000-6-2 EN 61326
Degree of protection	IP20

Input data

Non-load voltage	~ 8 V DC
Switching points (attenuated)	< 1.2 mA (blocking)
Switching points (unattenuated)	> 2.1 mA (conductive)

Output data

Switching output	Relay output
Contact type	1 PDT
Contact material	AgSnO ₂ , hard gold-plated
Maximum switching voltage	250 V AC (2 A)
	120 V DC (0.2 A)
	30 V DC (2 A)
Maximum switching capacity	500 VA
Mechanical service life	10 ⁷ cycles

Power supply

Nominal supply voltage	24 V DC -20 % ... +25 %
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC (-20% ... +25%))
Max. current consumption	21 mA (24 V DC)
Power consumption	< 650 mW

Connection data

Conductor cross section solid min.	0.2 mm ²
Conductor cross section solid max.	2.5 mm ²
Conductor cross section flexible min.	0.2 mm ²
Conductor cross section flexible max.	2.5 mm ²
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
Status display	Green LED (supply voltage)
	LED yellow (switching state)
	Red LED (line errors)
Inflammability class according to UL 94	V0
Pollution degree	2
Overvoltage category	II
Housing material	PA 66-FR
Color	green
Designation	Input/output
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Designation	Input/output/supply, DIN rail connector
Electrical isolation	300 V _{rms} (Rated insulation voltage (overvoltage category II; pollution degree 2, safe isolation as per EN 61010-1))
	2.5 kV (50 Hz, 1 min., test voltage)
Designation	Output/input, supply, TBUS
Electrical isolation	300 V _{rms} (Rated insulation voltage (overvoltage category III; pollution degree 2, safe isolation as per EN 61010-1))
	2.5 kV (50 Hz, 1 min., test voltage)
Designation	Input/supply, DIN rail connector
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
IECEX	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA nC IIC T4 Gc
UL, USA / Canada	Class I Div 2; IS for Class I, II, III Div 1

Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Designation	Non-inverted operation

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Safety characteristic data

Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	78 %
λ_{SU}	2.49×10^{-7} (249 FIT)
λ_{SD}	6×10^{-9} (6 FIT)
λ_{DU}	6.4×10^{-8} (64 FIT)
λ_{DD}	7×10^{-9} (7 FIT)
Probability of a hazardous failure on demand (PFD _{AVG})	3.09×10^{-4} (1 year)
	6.17×10^{-4} (2 years)
	1.54×10^{-3} (5 years)
Diagnostic coverage (DC)	DC _S = 2.4%, DC _D = 9%
Integrity requirement	IEC 61508 - Low demand
Designation	Inverted operation
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	78 %
λ_{SU}	2.48×10^{-7} (248 FIT)
λ_{SD}	1×10^{-9} (1 FIT)
λ_{DU}	6.2×10^{-8} (62 FIT)
λ_{DD}	6×10^{-9} (6 FIT)
Probability of a hazardous failure on demand (PFD _{AVG})	3.01×10^{-4} (1 year)
	6.02×10^{-4} (2 years)
	1.5×10^{-3} (5 years)
Diagnostic coverage (DC)	DC _S = 0.4%, DC _D = 8%

Safety data

Max. internal inductance L _i	negligible
Max. internal capacitance C _i	11 nF
Max. output voltage U _o	9.6 V
Max. output current I _o	10 mA
Max. output power P _o	25 mW
Group	IIC
Max. external inductivity L _o	300 mH
Max. external capacity C _o	3.6 μF
Group	IIB/IIIC

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Safety data

Max. external inductivity L_o	1000 mH
Max. external capacity C_o	26 μ F
Safety-related maximum voltage U_m	253 V AC (125 V DC)

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	EC001430
ETIM 3.0	EC001599
ETIM 4.0	EC001485
ETIM 5.0	EC001485

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

Ex Approvals

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

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Approvals

Approvals submitted

Approval details

UL Listed

cUL Listed

GL

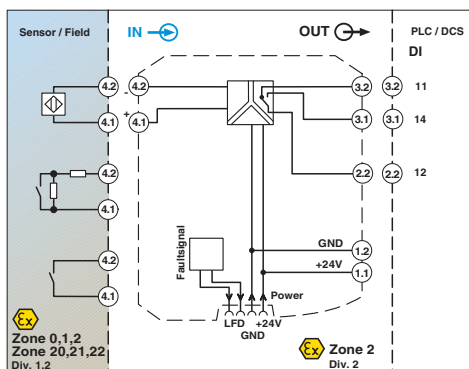
Functional Safety

EAC

cULus Listed

Drawings

Block diagram



Dimensional drawing

