

## Isolation amplifier - MACX MCR-SL-2NAM-RO - 2865049

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NAMUR isolation amplifier, 2-channel for operating proximity sensors and switches. The signals are transferred to the control level using relay outputs (N/O contact). Line fault detection (LFD), galvanic 3-way isolation, SIL 2.

### Why buy this product

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



### Key commercial data

Packing unit	1 pc
GTIN	
Weight per Piece (excluding packing)	140.0 g
Weight per piece (including packing)	146.2 g
Custom tariff number	85437090
Country of origin	Germany
Sales Key	J1 - MSR Technology
Note	Made to Order (non-returnable)

### Technical data

Note

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## 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

### 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)	5 % ... 95 % (non-condensing)
Noise immunity	EN 61000-6-2
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 N/O contact per channel
Contact material	AgSnO <sub>2</sub> , hard gold-plated
Maximum switching voltage	250 V AC (2 A) 120 V DC (0.2 A) 30 V DC (2 A)
Max. switching power	500 VA
Mechanical service life	10 <sup>7</sup> cycles

### Power supply

Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC
Max. current consumption	35 mA (24 V DC)
Power consumption	< 1 W

### Connection data

Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	2.5 mm <sup>2</sup>
Conductor cross section stranded min.	0.2 mm <sup>2</sup>
Conductor cross section stranded max.	2.5 mm <sup>2</sup>
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil 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	2
Status display	Green LED (supply voltage) LED yellow (switching state) Red LED (line errors)
Inflammability class according to UL 94	V0
Pollution degree	2
Surge voltage category	III
Housing material	PA 66-FR
Color	green
Designation	Input/supply, DIN rail connector
Electrical isolation	300 V <sub>rms</sub> (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Designation	Output 1/output 2/input, power supply, T connector
Electrical isolation	300 V <sub>rms</sub> (Rated insulation voltage (surge voltage category III; pollution degree 2, safe isolation as per EN 61010-1)) 2.5 kV (50 Hz, 1 min., test voltage)
Conformance	CE-compliant, additionally EN 61326
ATEX	# II 3 G Ex nA nC IIC T4 Gc X
UL, USA / Canada	UL 508 Listed UL 61010 Listed Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, Group IIC T4

### Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Designation	Non-inverted operation
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	78 %
$\lambda_{SU}$	$2.49 \times 10^{-7}$ (249 FIT)
$\lambda_{SD}$	$6 \times 10^{-9}$ (6 FIT)
$\lambda_{DU}$	$6.4 \times 10^{-8}$ (64 FIT)
$\lambda_{DD}$	$7 \times 10^{-9}$ (7 FIT)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	$3.09 \times 10^{-4}$ (1 year)

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### Safety characteristic data

	6.17 x 10 <sup>-4</sup> (2 years)
	1.54 x 10 <sup>-3</sup> (5 years)
Diagnostic coverage (DC)	DC <sub>S</sub> = 2.4%, DC <sub>D</sub> = 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 <sub>SU</sub>	2.48 x 10 <sup>-7</sup> (248 FIT)
λ <sub>SD</sub>	1 x 10 <sup>-9</sup> (1 FIT)
λ <sub>DU</sub>	6.2 x 10 <sup>-8</sup> (62 FIT)
λ <sub>DD</sub>	6 x 10 <sup>-9</sup> (6 FIT)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	3.01 x 10 <sup>-4</sup> (1 year)
	6.02 x 10 <sup>-4</sup> (2 years)
	1.5 x 10 <sup>-3</sup> (5 years)
Diagnostic coverage (DC)	DC <sub>S</sub> = 0.4%, DC <sub>D</sub> = 8%

## 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

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## Approvals

### Approvals

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#### Approvals

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

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#### Ex Approvals

ATEX / UL Listed / cUL Listed / cULus Listed

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#### Approvals submitted

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### Approval details

GL

Functional Safety

UL Listed 

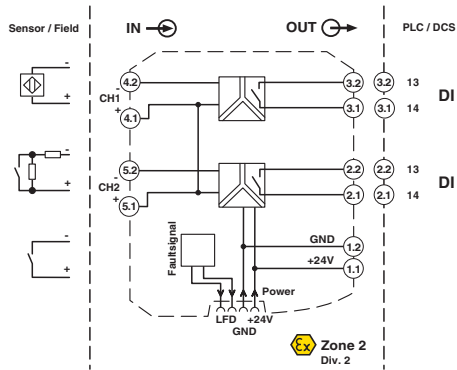
cUL Listed 

cULus Listed 

## Drawings

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Block diagram



Dimensioned drawing

