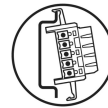


# MACX MCR-EX-SL-NAM-2RO

Order No.: 2865450



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



## Commercial data

EAN	 4 046356 160476
Pack	1
Customs tariff	85438997
Product key	09722
Country of Origin	DE
Catalog page information	Page 445 (IF-2011)

## Product notes

WEEE/RoHS-compliant since:  
02/08/2006



Please note that the data given here has been taken from the online catalog. For comprehensive information and data, please refer to the user documentation at <http://www.download.phoenixcontact.com>. The General Terms and Conditions of Use apply to Internet downloads.

## Technical data

### Input data

Non-load voltage	8 V DC $\pm$ 10 %
Switching points (attenuated)	< 1.2 mA (blocking)
Switching points (unattenuated)	> 2.1 mA (conductive)

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**Output data**

Switching output	Relay output
Contact type	2 N/O contacts
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	30 mA (24 V DC)
Power consumption	< 950 mW

**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
Stripping length	8 mm
Screw thread	M3
Connection method	Screw connection
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

**General data**

No. of channels	1
Ambient temperature (operation)	-20 °C ... 60 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	10 % ... 95 % (no condensation)
Status display	Green LED (supply voltage)
	LED yellow (switching state)
	Red LED (line errors)

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Width	12.5 mm
Height	99 mm
Depth	114.5 mm
Inflammability class according to UL 94	V0
Pollution degree	2
Surge voltage category	III
Housing material	PA 66-FR
Degree of protection	IP20
Color	green
Electrical isolation input / output	375 V (Peak value in accordance with EN 60079-11)
Electrical isolation input / supply	375 V (Peak value in accordance with EN 60079-11)
Electrical isolation input / supply / T connector	300 V <sub>rms</sub> (Rated insulation voltage, surge voltage category II; pollution degree 2, basic insulation as per EN 61010, EN 50178)
Electrical isolation of output 1/output 2/input, power supply, T connector	300 V <sub>rms</sub> (Rated insulation voltage, surge voltage category III; pollution degree 2, safe isolation as per EN 61010, EN 50178)
Conformance	CE-compliant, additionally EN 61326
ATEX	II (1) GD [Ex ia] IIC Ex II 3 G Ex nAC IIC T4 X
IECEx	[Ex ia] IIC; [Ex iaD]; Ex nAC IIC T4 X
UL, USA / Canada	Class I Div 2; IS for Class I, II, III Div 1
Functional safety (SIL)	SIL 2 according to EN 61508

#### Safety characteristic data

Integrity requirement	for 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)
	$6.17 \times 10^{-4}$ (2 years)
	$1.54 \times 10^{-3}$ (5 years)

Diagnostic coverage (DC)	(DC <sub>S</sub> = 2.4%, DC <sub>D</sub> = 9%)
Integrity requirement	for IEC 61508 - Low demand
Designation	Inverted operation
Equipment type	Type A
Safety Integrity Level (SIL)	Up to 2
Safe Failure Fraction (SFF)	78 %
$\lambda_{SU}$	$2.48 \times 10^{-7}$ (248 FIT)
$\lambda_{SD}$	$1 \times 10^{-9}$ (1 FIT)
$\lambda_{DU}$	$6.2 \times 10^{-8}$ (62 FIT)
$\lambda_{DD}$	$6 \times 10^{-9}$ (6 FIT)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	$3.01 \times 10^{-4}$ (1 year)
	$6.02 \times 10^{-4}$ (2 years)
	$1.5 \times 10^{-3}$ (5 years)
Diagnostic coverage (DC)	(DC <sub>S</sub> = 0.4%, DC <sub>D</sub> = 8%)

#### Safety data

Max. capacitance C <sub>i</sub>	11 nF
Max. voltage U <sub>o</sub>	9.6 V
Max. current I <sub>o</sub>	10 mA
Max. power P <sub>o</sub>	25 mW
Gas group	II C
Max. external inductivity L <sub>o</sub>	100 mH
Max. external capacity C <sub>o</sub>	510 nF
Gas group	II C
Max. external inductivity L <sub>o</sub>	5 mH
Max. external capacity C <sub>o</sub>	840 nF
Gas group	II C
Max. external inductivity L <sub>o</sub>	1 mH
Max. external capacity C <sub>o</sub>	1.2 $\mu$ F
Gas group	II C
Max. external inductivity L <sub>o</sub>	10 $\mu$ H
Max. external capacity C <sub>o</sub>	3.6 $\mu$ F
Safety-related maximum voltage U <sub>m</sub>	253 V AC (125 V DC)
Gas group	II B

Max. external inductivity L <sub>o</sub>	100 mH
Max. external capacity C <sub>o</sub>	2.7 µF
Gas group	II B
Max. external inductivity L <sub>o</sub>	5 mH
Max. external capacity C <sub>o</sub>	4.4 µF
Gas group	II B
Max. external inductivity L <sub>o</sub>	1 mH
Max. external capacity C <sub>o</sub>	6.3 µF
Gas group	II B
Max. external inductivity L <sub>o</sub>	10 µH
Max. external capacity C <sub>o</sub>	26 µF

### Certificates



Certification

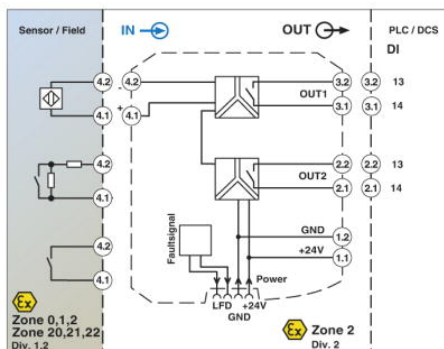
CUL Listed, GL, UL Listed

Certification Ex:

CUL-EX LIS, IECEX, PxC-EX, UL-EX LIS

### Drawings

Block diagram



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Dimensioned drawing

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