

# MACX MCR-EX-SL-NAM-R-SP

Order No.: 2924045

The illustration shows the versions with screw connection




<http://eshop.phoenixcontact.de/phoenix/treeViewClick.do?UID=2924045>

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.



## Commercial data

GTIN (EAN)	 4 046356 338059
sales group	H722
Pack	1 pcs.
Customs tariff	85437090
Catalog page information	Page 444 (IF-2011)

## Product notes

WEEE/RoHS-compliant since:  
05/23/2008



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## 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)

**Output data**

Switching output	Relay output
Contact type	1 PDT
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	21 mA (24 V DC)
Power consumption	< 650 mW

**Connection data**

Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	1.5 mm <sup>2</sup>
Conductor cross section stranded min.	0.2 mm <sup>2</sup>
Conductor cross section stranded max.	1.5 mm <sup>2</sup>
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	16
Stripping length	7 mm
Connection method	Spring-cage conn.

**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)
Width	12.5 mm
Height	99 mm
Depth	114.5 mm

Inflammability class acc. to UL 94	V0
Pollution degree	2
Surge voltage category	II
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 of output/input/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)
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)
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 µF
Gas group	II C
Max. external inductivity L <sub>o</sub>	10 µH
Max. external capacity C <sub>o</sub>	3.6 µF
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 / Approvals**



Certification

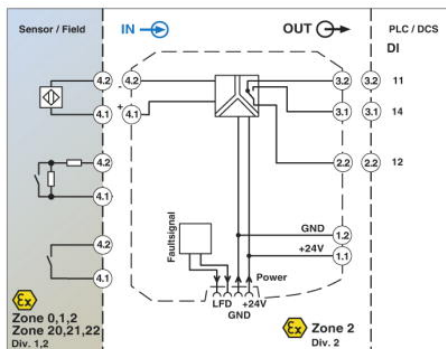
CUL Listed, GL, UL Listed

Certification Ex:

CUL-EX LIS, IECEx, PxC-EX, UL-EX LIS

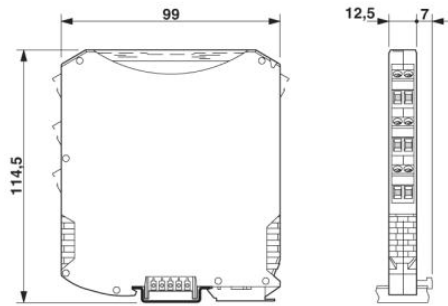
**Diagrams/Drawings**

Block diagram



Dimensioned drawing

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