

# MACX MCR-SL-2NAM-T-SP - Isolation amplifier



2924281

<https://www.phoenixcontact.com/us/products/2924281>

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NAMUR 2-channel signal conditioner for operating proximity sensors and switches. The signals are transmitted to the control level via transistor outputs (passive). Line fault detection, 3-way electrical isolation, SIL 2, Push-in connection.

## Your advantages

- Power supply and error indication possible via DIN rail connector
- Up to SIL 2 in accordance with EN 61508
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- Line fault detection (LFD), can be activated/deactivated, error indicated by flashing red LED with disabling of transistor output
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit
- LED indicators for supply voltage, switching state, and malfunction in accordance with NAMUR NE 44
- 2-channel
- Transistor signal output (passive); up to 5 kHz
- 3-way electrical isolation
- Direction of operation can be selected (operating or closed circuit current behavior)

## Commercial data

Item number	2924281
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C402
Product key	CK1141
Catalog page	Page 139 (C-5-2019)
GTIN	4046356491754
Weight per piece (including packing)	177.5 g
Weight per piece (excluding packing)	169.1 g
Customs tariff number	85365019
Country of origin	DE

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## Technical data

### Notes

#### Utilization restriction

EMC note	EMC: class A product, see manufacturer's declaration in the download area
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### Product properties

Product type	Isolating switch transf.
Product family	MACX Analog
Application	Digital IN
No. of channels	2
Type	Signal conditioners with SIL functional safety
Configuration	DIP switches

#### Insulation characteristics: GB Standard

Overvoltage category	II
Pollution degree	2

### System properties

#### Functionality

Configuration	DIP switches
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### Electrical properties

Electrical isolation	3-way isolation
Electrical isolation between input and output	yes

#### Electrical isolation Input/output

Electrical isolation	265 V (Peak value in accordance with IEC/EN 60079-7)
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#### Electrical isolation Input/output/supply, DIN rail connector

Rated insulation voltage	300 V <sub>rms</sub>
Test voltage	2.5 kV AC (50 Hz, 60 s)
Insulation	Safe isolation in accordance with IEC/EN 61010-1

#### Electrical isolation Input/supply, DIN rail connector

Electrical isolation	265 V (Peak value in accordance with IEC/EN 60079-7)
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#### Electrical isolation Output 1/output 2

Rated insulation voltage	50 V <sub>rms</sub>
Test voltage	1 kV AC (50 Hz, 60 s)
Insulation	Basic insulation in accordance with IEC/EN 61010-1

### Supply

Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC, -20 % ... +25 %)

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Max. current consumption	< 34 mA (24 V DC)
Power dissipation	≤ 1000 mW
Power consumption	0.8 W

## Input data

Signal: NAMUR

Number of inputs	2
Available input sources	NAMUR proximity sensors (IEC/EN 60947-5-6) Floating switch contacts Switch contacts with resistance circuit
Switching threshold "0" signal current	< 1.2 mA (blocking)
Switching threshold "1" signal, current	> 2.1 mA (conductive)
Short-circuit current	8 mA
Switching hysteresis	< 0.2 mA
Line fault detection	< 0.05 mA ... 0.35 mA (Line break) < 100 Ω ... 360 Ω (Short circuit) Activated /deactivated via DIP switch
Non-load voltage	8 V DC

## Output data

Switching: Transistor

Output description	passive
Minimum switching voltage	3 V DC
Maximum switching voltage	30 V DC
Drop ( $\Delta U$ )	< 1.4 V
Max. switching current	50 mA (short-circuit-proof)
Min. switching current	5 mA (short-circuit-proof)
Switching frequency	≤ 5 kHz

Signal

Number of outputs	2
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## Connection data

Connection method	Push-in connection
Stripping length	8 mm
Conductor cross section rigid	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross section AWG	24 ... 16

## Ex data

Ex installation (EPL)	Gc Div. 2
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## Interfaces

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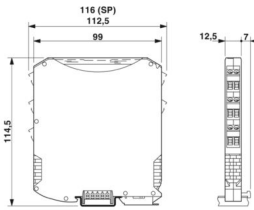
## Data

No. of channels	0
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## Signaling

Status display	Green LED (supply voltage)
	LED yellow (switching state)
	Red LED (line errors)

## Dimensions

Dimensional drawing	
Width	12.5 mm
Height	116 mm
Depth	113.7 mm
Depth NS 35/7,5	114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715)

## Material specifications

Color	gray (RAL 7042)
Flammability rating according to UL 94	V0 (Housing)
Housing material	PA 6.6-FR

## Characteristics

### Safety data

Safety Integrity Level (SIL)	2
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Safety Integrity Level (SIL)	2
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## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20 (not assessed by UL)
Ambient temperature (operation)	-40 °C ... 70 °C (Any mounting position)
	-40 °C ... 70 °C (Derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	10 % ... 95 % (non-condensing)

Altitude range ( $\leq$  2000 m)

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Altitude	≤ 2000 m (The technical data refers to altitudes ≤2000 m above mean sea level. For altitudes >2000 m above mean sea level, refer to the data sheet.)
Ambient temperature (operation)	-40 °C ... 60 °C -40 °C ... 70 °C (Derating)
Rated insulation voltage	265 V AC/DC (U <sub>Isolation "ec"</sub> : Supply, input / output)

## Altitude range (≤ 3000 m)

Height range	> 2000 m ... 3000 m
Ambient temperature (operation)	-40 °C ... 54 °C -40 °C ... 63 °C (Derating)
Rated insulation voltage	190 V AC/DC (U <sub>Isolation "ec"</sub> : Supply, input / output)

## Altitude range (≤ 4000 m)

Height range	> 3000 m ... 4000 m
Ambient temperature (operation)	-40 °C ... 48 °C -40 °C ... 56 °C (Derating)
Rated insulation voltage	60 V AC/DC (U <sub>Isolation "ec"</sub> : Supply, input / output)

## Altitude range (≤ 5000 m)

Height range	> 4000 m ... 5000 m
Ambient temperature (operation)	-40 °C ... 42 °C -40 °C ... 49 °C (Derating)
Rated insulation voltage	60 V AC/DC (U <sub>Isolation "ec"</sub> : Supply, input / output)

## Approvals

### CE

Certificate	CE-compliant
Note	and EN 61326

### ATEX

Identification	⊕ II 3 G Ex ec IIC T4 Gc
Certificate	IBExU 08 ATEX 1100 X

### UKCA Ex (UKEX)

Identification	⊕ II 3 G Ex ec IIC T4 Gc
Certificate	CML 22UKEX3527X

### IECEX

Identification	Ex ec IIC T4 Gc
Certificate	IECEX IBE 08.0005X

### CCC / China-Ex

Identification	Ex ec IIC T4 Gc
Certificate	2022122310115713

### UL, USA/Canada

UL 508 Listed

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Identification	UL 61010 Listed
	Class I, Div. 2, Groups A, B, C, D T4
	Class I, Zone 2, Group IIC T4

## Shipbuilding approval

Certificate	DNV GL TAA00000AG
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## Safety Integrity Level (SIL, IEC 61508)

Identification	2
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## INMETRO

Identification	Ex ec IIC T4 Gc
Certificate	DNV 18.0141 X

## EAC Ex

Identification	Ex nA IIC T4 Gc
Certificate	BY/112 02.01 TP012 103.01 00078

## DNV GL data

Temperature	B
Humidity	B
Vibration	A
EMC	B
Enclosure	Required protection according to the Rules shall be provided upon installation on board

## EMC data

Noise immunity	EN 61000-6-2
Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4

## Electromagnetic HF field

Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
Evaluation criterion	A

## Fast transients (burst)

Designation	Fast transients (burst)
Standards/regulations	EN 61000-4-4
Evaluation criterion	A

## Conducted interference

Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Evaluation criterion	A

## Standards and regulations

Electrical isolation	3-way isolation
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## GB Standard

Standards/regulations	GB 3836.1
	GB 3836.3

## Mounting

Mounting type	DIN rail mounting
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## Classifications

### ECLASS

ECLASS-11.0	27210121
ECLASS-12.0	27210121
ECLASS-13.0	27210121

### ETIM

ETIM 9.0	EC001485
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### UNSPSC

UNSPSC 21.0	39121000
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## Environmental product compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For information on hazardous substances, refer to the manufacturer's declaration available under "Downloads"

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