

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

Please be informed that the data shown in this PDF document is generated from our online catalog. Please find the complete data in the user documentation. Our general terms of use for downloads are valid.



2-channel Ex i NAMUR signal conditioner with wide range power supply for proximity sensors and switches. In terms of signal output, for each channel there is a relay with a changeover contact available. Fault detection (LFD), 3-way isolation, SIL 2.

## Your advantages

- 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 de-excitation of output relay
- Wide-range power supply of 19.2 ... 253 V AC/DC
- Direction of operation can be selected (operating or closed circuit current behavior)
- LED indicators for supply voltage, switching state, and malfunction in accordance with NAMUR NE 44
- Signal output relay (changeover contact)
- Input for NAMUR proximity sensors (EN 60947-5-6), floating contacts or contacts with resistance circuit, [Ex ia] IIC
- 3-way electrical isolation
- 2-channel

## Commercial data

Item number	2924249
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	C430
Product key	DK1213
GTIN	4046356463683
Weight per piece (including packing)	195.7 g
Weight per piece (excluding packing)	100 g
Customs tariff number	85365019
Country of origin	DE

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

## Technical data

### Product properties

Product type	Isolating switch amplifier
Product family	MACX Analog
No. of channels	2
Configuration	DIP switches

### System properties

#### Functionality

Configuration	DIP switches
---------------	--------------

### Electrical properties

Electrical isolation	3-way isolation
Electrical isolation between input and output	yes
Maximum power dissipation for nominal condition	$\leq 1.3 \text{ W}$
Step response (10-90%)	typ. 6 ms (N/O contact: OFF/ON)
	typ. 6 ms (N/O contact: ON/OFF)
	typ. 4 ms (N/C contact: ON/OFF)
	typ. 10 ms (N/C contact: OFF/ON)

#### Electrical isolation

Test voltage	2.5 kV AC (50 Hz, 60 s)
--------------	-------------------------

#### Electrical isolation Input/output IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V <sub>PP</sub>
Overvoltage category	III
Pollution degree	2

#### Electrical isolation Input/power supply IEC/EN 60079-11

Standards/regulations	IEC/EN 60079-11
Rated insulation voltage	375 V <sub>PP</sub>
Overvoltage category	II
Pollution degree	2

#### Electrical isolation Input/power supply IEC/EN 61010-1

Standards/regulations	IEC/EN 61010-1
Rated insulation voltage	300 V <sub>rms</sub>
Overvoltage category	II
Pollution degree	2
Insulation	Safe isolation

#### Electrical isolation Output 1/output 2/input, power supply IEC/EN 61010-1

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

Standards/regulations	IEC/EN 61010-1
Rated insulation voltage	300 V <sub>rms</sub>
Overvoltage category	III
Pollution degree	2
Insulation	Safe isolation

## Supply

Nominal supply voltage range	24 V AC/DC ... 230 V AC/DC -20 % ... +10 % (50/60 Hz)
Supply voltage range	19.2 V AC/DC ... 253 V AC/DC (50/60 Hz)
Max. current consumption	< 80 mA
	< 42 mA (24 V DC)
Power dissipation	< 1.1 W
Power consumption	< 1.1 W

## Input data

Signal: NAMUR

Description of the input	intrinsically safe
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
Open-circuit voltage	8 V DC

## Output data

Switching: Relay

Contact switching type	1 changeover contact per channel
Contact material	AgSnO <sub>2</sub> , hard gold-plated
Maximum switching voltage	250 V AC (2 A, 60 Hz)
	120 V DC (0.2 A)
	30 V DC (2 A)
Maximum switching power	500 VA
Recommended minimum load	5 V / 10 mA

Signal

Number of outputs	2
-------------------	---

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

## Connection data

Connection method	Push-in connection
Stripping length	10 mm
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section flexible (2 conductors with same cross section)	0.25 mm <sup>2</sup> ... 0.34 mm <sup>2</sup> (TWIN ferrule without plastic sleeve)
	0.5 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> (TWIN ferrule with plastic sleeve)
Conductor cross-section AWG	24 ... 14
	24 ... 22 (TWIN ferrule without plastic sleeve)
	20 ... 16 (TWIN ferrule with plastic sleeve)

## Ex data

Ex installation (EPL)	Gc
	Div. 2
Ex i circuits (EPL)	[Ga]
	[Da]
	[Ma]
	[Div. 1]

## Safety data

Max. internal inductance $L_i$	negligible
Max. internal capacitance $C_i$	negligible
Max. output voltage $U_o$	9.56 V
Max. output current $I_o$	10.3 mA
Max. output power $P_o$	25 mW
Safety-related maximum voltage $U_m$	253 V AC/DC (Supply terminals)
	250 V AC (Output terminals)
	120 V DC (Output terminals)
IIA (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	1000 mH / 210 $\mu$ F
IIB/IIIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	1000 mH / 26 $\mu$ F
IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	300 mH / 3.6 $\mu$ F
IIB/IIA/I (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 1 $\mu$ F
IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 510 nF, 50 mH / 580 nF, 5 mH / 600 nF

## Signaling

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

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

## Dimensions

Dimensional drawing	
Width	17.5 mm
Height	107.9 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 (Housing)	V0 (Housing)
Housing material	PA 6.6-FR

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20 (not assessed by UL)
Ambient temperature (operation)	-40 °C ... 60 °C (Any mounting position) -40 °C ... 70 °C (Derating)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Permissible humidity (operation)	10 % ... 95 % (non-condensing)

### Altitude range (≤ 2000 m)

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	253 V AC (Power supply, input / output) 125 V DC (Power 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 (Power supply, input / output) 110 V DC (Power supply, input / output)

### Altitude range (≤ 4000 m)

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

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 (Power 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 (Power supply, input / output)

## Approvals

### CE

Certificate	CE-compliant
Note	and EN 61326

### ATEX

Identification	⊕ II (1) G [Ex ia Ga] IIC
	⊕ II (1) D [Ex ia Da] IIIC
	⊕ II 3 (1) G Ex ec [ia Ga] nC IIC T4 Gc
	⊕ I (M1) [Ex ia Ma] I
Certificate	IBExU 10 ATEX 1005

### IECEX

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] nC IIC T4 Gc
	[Ex ia Ma] I
Certificate	IECEX IBE 10.0002X

### CCC / China-Ex

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec nC [ia Ga] IIC T4 Gc
Certificate	2022122316115976

### UL, USA/Canada

Identification	Class I Div 2; IS for Class I, II, III Div 1
Certificate	Ⓢ.Ⓢ. C.D.-No 83104549

### Shipbuilding approval

Certificate	DNV GL TAA000020C
-------------	-------------------

### Safety Integrity Level (SIL, IEC 61508)

Identification	2
----------------	---

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

Certificate	IN-AT-AS-MRL-24-00163
-------------	-----------------------

## Systematic Capability

Identification	3
----------------	---

## INMETRO

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec nC [ia Ga] IIC T4 Gc
	[Ex ia Ma] I
Certificate	DNV 18.0116 X

## Shipbuilding data

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

## EMC data

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

## Noise emission

Standards/regulations	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
----------------------	-----------------

## GB Standard

	GB/T 3836.1
--	-------------

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

Standards/regulations	GB/T 3836.3
	GB/T 3836.4
	GB/T 3836.8

## Mounting

Mounting type	DIN rail mounting
---------------	-------------------

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier

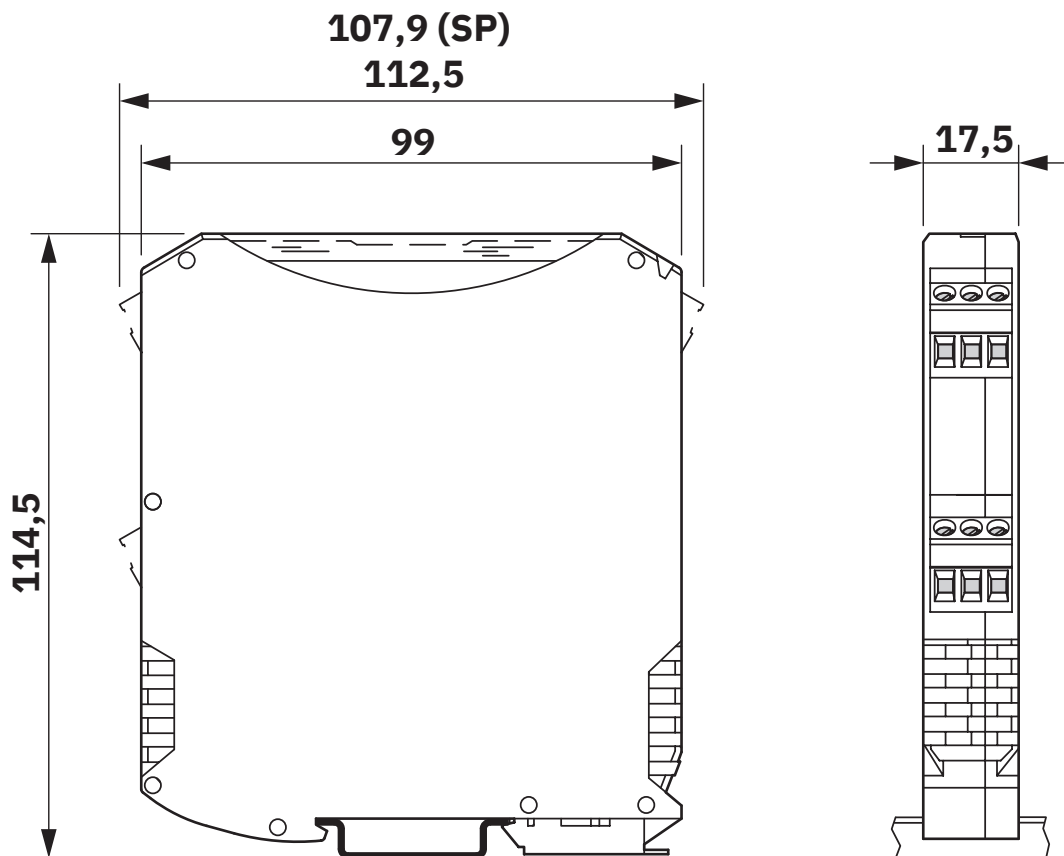


2924249

<https://www.phoenixcontact.com/us/products/2924249>

## Drawings

Dimensional drawing



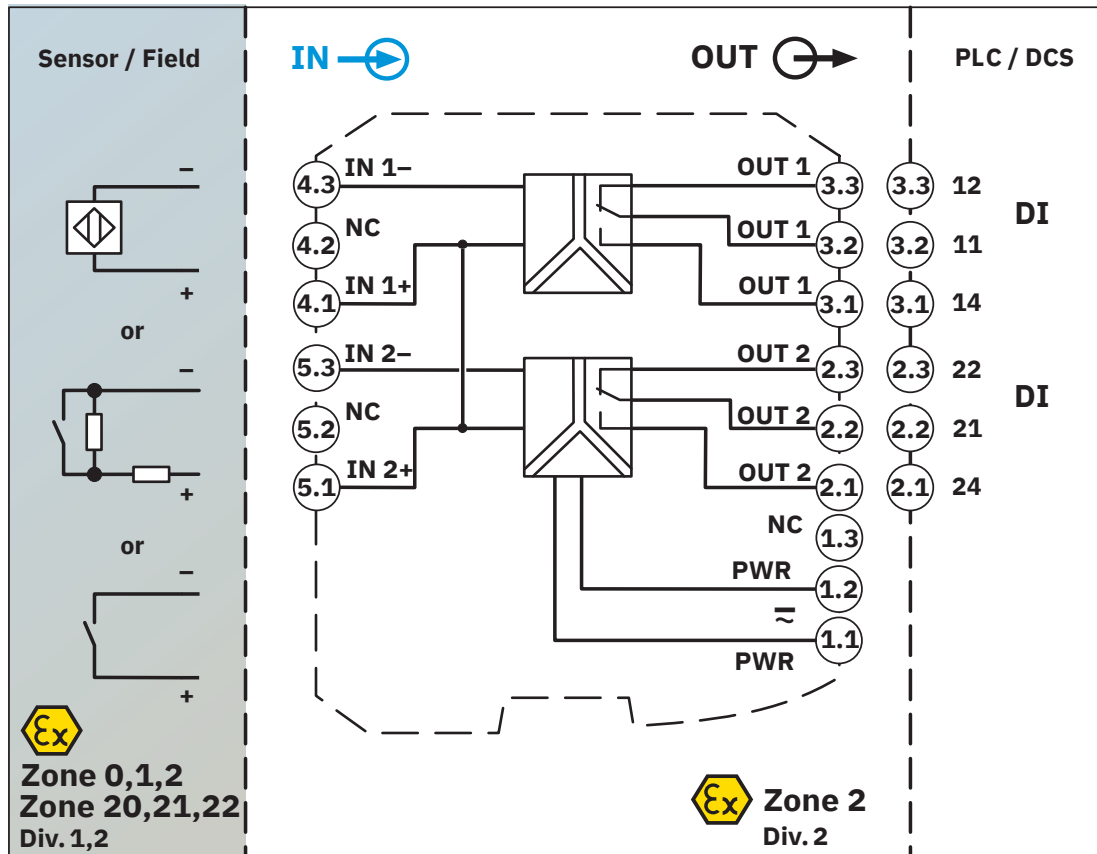
# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

Block diagram



# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2924249>



**UL Listed**

Approval ID: FILE E 330267



**cUL Listed**

Approval ID: E330267

**DNV**

Approval ID: TAA000020C

**TUEV Austria FS**

Approval ID: IN-AT-AS-24-00163

**ECAS**

Approval ID: 163681 E25 08 169508



**EAC Ex**

Approval ID: RU C-DE.AB72.B.00093



**IECEx**

Approval ID: IECEx IBE 10.0002X



**cUL Listed**

Approval ID: FILE E 199827



**UL Listed**

Approval ID: FILE E 199827

**INMETRO**

Approval ID: DNV 18.0116 X



**ATEX**

Approval ID: IBEExU 10 ATEX 1005

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>



CCC

Approval ID: 2022122316115976

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

## Classifications

### ECLASS

ECLASS-13.0	27210121
ECLASS-14.0 ASSET	27250101
ECLASS-15.0	27210121
ECLASS-15.0 ASSET	27250101

### ETIM

ETIM 10.0	EC001485
-----------	----------

### UNSPSC

UNSPSC 21.0	39121000
-------------	----------

# MACX MCR-EX-SL-2NAM-R-UP-SP - Isolation switch amplifier



2924249

<https://www.phoenixcontact.com/us/products/2924249>

## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
	2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol(CAS: 79-94-7)
SCIP	5e58644f-ccb9-4ab9-8aca-e53521c3f1a2

Phoenix Contact 2026 © - all rights reserved

<https://www.phoenixcontact.com>

Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)