

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



2924249

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

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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	CK3141
Product Key	CK3141
Catalog Page	Page 157 (C-5-2019)
GTIN	4046356463683
Weight per Piece (including packing)	213 g
Weight per Piece (excluding packing)	100 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
No. of channels	2
Type	Ex i signal conditioners with SIL functional safety
Configuration	DIP switches

Electrical properties

No. of channels	2
Electrical isolation	3-way isolation
Electrical isolation between input and output	yes
Maximum power dissipation for nominal condition	≤ 1.3 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 Input/output

Electrical isolation	375 V (Peak value in accordance with IEC/EN 60079-11)
Overvoltage category	III
Degree of pollution	2

Electrical isolation Input/power supply

Electrical isolation	375 V (Peak value in accordance with IEC/EN 60079-11)
Rated insulation voltage	300 V _{rms}
Test voltage	2.5 kV AC (50 Hz, 60 s)
Overvoltage category	II
Degree of pollution	2
Insulation	Safe isolation in accordance with IEC/EN 61010-1

Electrical isolation Output 1/output 2/input, power supply

Rated insulation voltage	300 V _{rms}
Test voltage	2.5 kV AC (50 Hz, 60 s)
Overvoltage category	III
Degree of pollution	2
Insulation	Safe isolation in accordance with IEC/EN 61010-1

Supply

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Nominal supply voltage range	24 V AC/DC ... 230 V AC/DC (-20 % ... +10 %, 50 Hz ... 60 Hz)
Supply voltage range	19.2 V AC/DC ... 253 V AC/DC (-20 % ... +10 %, 50 Hz ... 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
Non-load voltage	8 V DC

Output data

Switching: Relay

Contact type	1 changeover contact per channel
Contact material	AgSnO ₂ , 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 capacity	500 VA
Recommended minimum load	5 V / 10 mA

Signal

Number of outputs	2
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Connection data

Connection method	Push-in connection
Stripping length	8 mm
Conductor cross section solid	0.2 mm ² ... 1.5 mm ²
Conductor cross section flexible	0.2 mm ² ... 1.5 mm ²
Conductor cross section AWG	24 ... 16

Ex data

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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	11 nF
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)
IIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	300 mH / 3.6 μ F
	100 mH / 510 nF, 50 mH / 580 nF, 5 mH / 600 nF, 1 mH / 600 nF, 10 μ H / 600 nF
IIB/IIIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	1000 mH / 26 μ F
	100 mH / 1 μ F, 5 mH / 1 μ F, 1 mH / 1 μ F, 10 μ H / 1 μ F

LED signaling

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

Dimensions

Dimensional drawing	
Width	17.5 mm
Height	116 mm
Depth	113.7 mm
	114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715)

Material specifications

Flammability rating according to UL 94	V0 (Housing)
Housing material	PA 6.6-FR

Environmental and real-life conditions

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Ambient conditions

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

Altitude range (≤ 2000 m)

Altitude	≤ 2000 m (For use at altitudes ≥2000 m above sea level, see data sheet.)
Ambient temperature (operation)	-40 °C ... 60 °C
Rated insulation voltage	320 V (Power supply, input / output)

Altitude range (≤ 3000 m)

Height range	> 2000 m ... 3000 m
Ambient temperature (operation)	-40 °C ... 54 °C
Rated insulation voltage	190 V (Power supply, input / output)

Altitude range (≤ 4000 m)

Height range	> 3000 m ... 4000 m
Ambient temperature (operation)	-40 °C ... 48 °C
Rated insulation voltage	63 V (Power supply, input / output)

Altitude range (≤ 5000 m)

Height range	> 4000 m ... 5000 m
Ambient temperature (operation)	-40 °C ... 42 °C
Rated insulation voltage	63 V (Power supply, input / output)

Approval data

CE

Certificate	CE-compliant
Note	and EN 61326

ATEX

Identification	<input type="checkbox"/> II (1) G [Ex ia Ga] IIC
	<input type="checkbox"/> II (1) D [Ex ia Da] IIIC
	<input type="checkbox"/> II 3(1) G Ex ec nC [ia Ga] IIC T4 Gc
	<input type="checkbox"/> I (M1) [Ex ia Ma] I
Certificate	IBExU 10 ATEX 1005

UKCA Ex (UKEX)

Identification	<input type="checkbox"/> I (M1) [Ex ia Ma] I
	<input type="checkbox"/> II (1) G [Ex ia Ga] IIC
	<input type="checkbox"/> II (1) D [Ex ia Da] IIIC
	<input type="checkbox"/> II 3 (1) G Ex ec [ia Ga] nC IIC T4 Gc
Certificate	CML 22UKEX3528X

IECEx

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

CCC / China-Ex

Identification	[Ex ia Ga] IIC
	[Ex iaD]
	Ex nA nC [ia Ga] IIC T4 Gc
Certificate	NEPSI GYJ20.1312X

UL, USA / Canada

Identification	Class I Div 2; IS for Class I, II, III Div 1
Certificate	<input type="checkbox"/> , C.D.-No 83104549

Shipbuilding approval

Certificate	DNV GL TAA000020C
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Safety Integrity Level (SIL, IEC 61508)

Identification	2
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Systematic Capability

Identification	3
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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

EAC Ex

Identification	<input type="checkbox"/> [Ex ia Ga] IIC
	<input type="checkbox"/> [Ex ia Da] IIIC
Certificate	RU C-DE.AB72.B.00093/19

DNV GL 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 emission	EN 61000-6-4

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Noise immunity	EN 61000-6-2
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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 3626.20
	GB 3836.1
	GB 3836.4
	GB 3836.8
	GB 12476.1
	GB 12476.4

Mounting

Mounting type	DIN rail mounting
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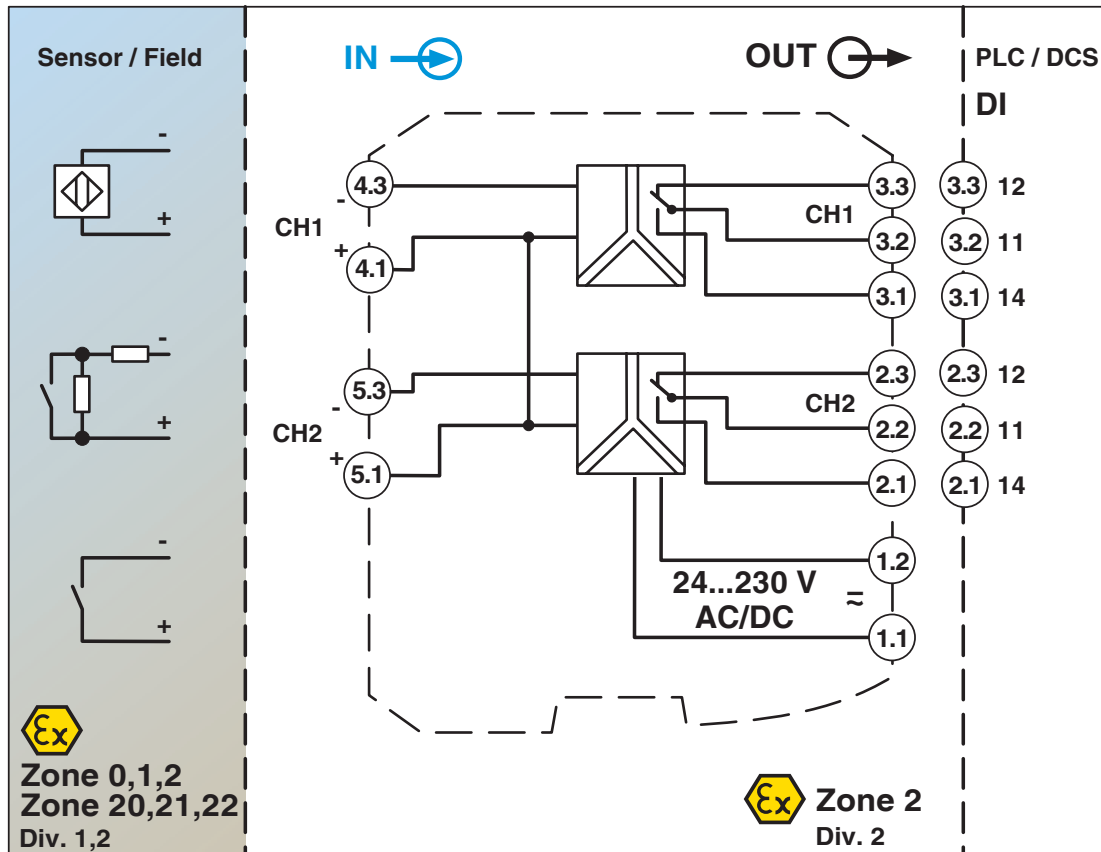


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Drawings

Block diagram



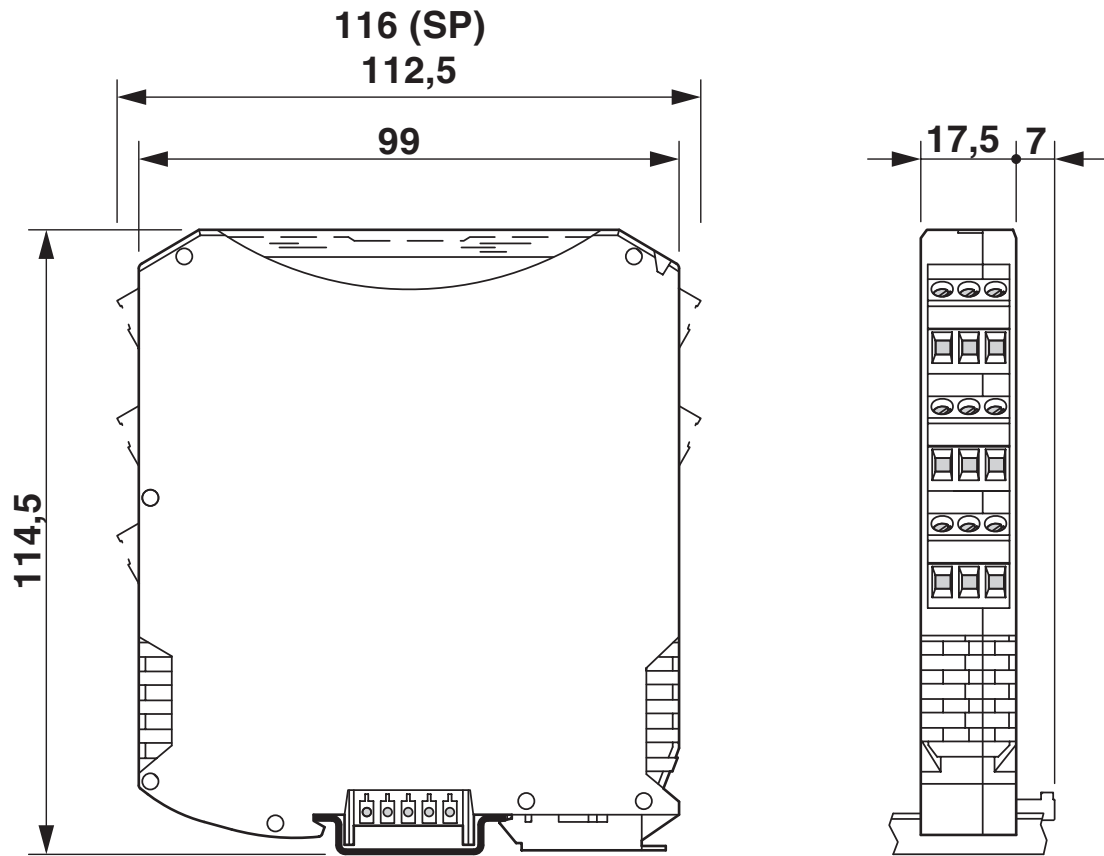
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Dimensional drawing



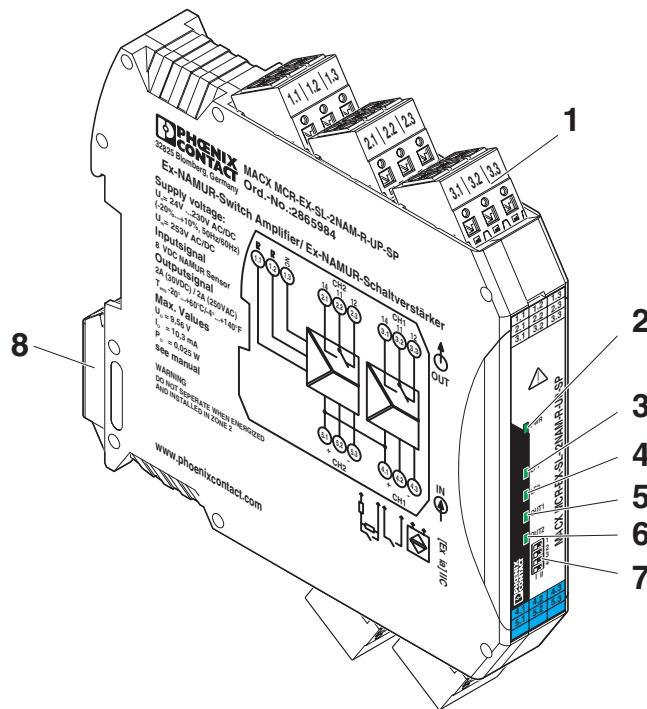
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Schematic diagram



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Approvals

**DNV GL**

Approval ID: TAA000020C

**UL Listed**

Approval ID: FILE E 330267

**CCC**

Approval ID: 2020322 316001515

**cUL Listed**

Approval ID: FILE E 330267

Functional Safety

Approval ID: 09/12-02 R010 V1R0

**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: IBExU 10 ATEX 1005

cULus Listed

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Classifications

ECLASS

ECLASS-9.0	27210121
ECLASS-10.0.1	27210121
ECLASS-11.0	27210121

ETIM

ETIM 8.0	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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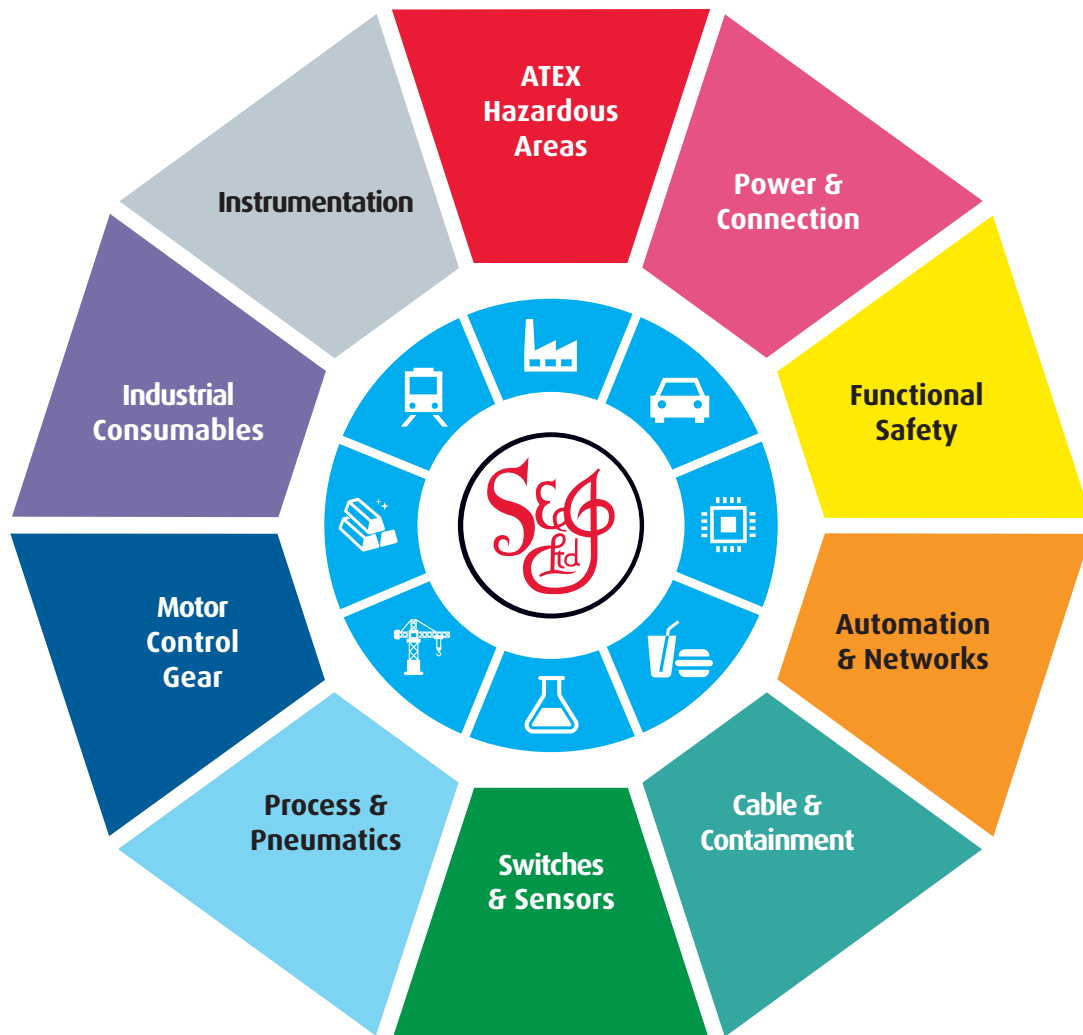
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