

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



Key Commercial Data

Packing unit	1 pc
GTIN	 4 046356 463683
GTIN	4046356463683

Technical data

Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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Dimensions

Width	17.5 mm
Height	116 mm
Depth	113.7 mm

Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Technical data

Dimensions

	114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715)
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Ambient conditions

Ambient temperature (operation)	-20 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Degree of protection	IP20 (not assessed by UL)
Noise immunity	EN 61000-6-2

Input data

Non-load voltage	~ 8 V DC
Switching points (attenuated)	< 1.2 mA (blocking)
Switching points (unattenuated)	> 2.1 mA (conductive)
Signal input	Intrinsically safe
Available input sources	NAMUR proximity sensors (IEC/EN 60947-5-6)
Short-circuit current	~ 8 mA
Switching hysteresis	approx. 0.2 mA
Line fault detection	Break 0.05 mA < IIN < 0.35 mA
	Short circuit 100 Ω < RSensor < 360 Ω

Output data

Switching output	Relay output
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
Mechanical service life	10 ⁷ cycles
Output description	Relay output
Switching frequency	≤ 20 Hz (Load-dependent)

Power supply

Nominal supply voltage range	24 V AC/DC ... 230 V AC/DC (50/60 Hz)
Supply voltage range	19.2 V AC/DC ... 253 V AC/DC (24 V AC/DC ... 230 V AC/DC (-20 % ... +10 %, 50/60 Hz))
Max. current consumption	< 80 mA
Power dissipation	≤ 1.3 W
Power consumption	< 1.9 W

Connection data

Connection method	Push-in connection
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Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Technical data

Connection data

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

General

No. of channels	2
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)
Status display	Green LED (supply voltage, PWR)
	LED yellow (switching state)
	Red LED (line errors)
Electromagnetic compatibility	Conformance with EMC directive
Interference emission	EN 61000-6-4
Housing material	PA 6.6-FR
Color	gray
Designation	Input/output
Electrical isolation	375 V (Peak value in accordance with IEC/EN 60079-11)
Overvoltage category	III
Degree of pollution	2
Designation	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, 1 min.)
Overvoltage category	II
Degree of pollution	2
Insulation	Safe isolation in accordance with IEC/EN 61010-1
Designation	Output 1/output 2/input, power supply
Rated insulation voltage	300 V _{rms}
Test voltage	2.5 kV AC (50 Hz, 1 min.)
Overvoltage category	III
Degree of pollution	2
Insulation	Safe isolation in accordance with IEC/EN 61010-1

Safety characteristic data

Safety Integrity Level (SIL)	2
	2

EMC data

Designation	Electromagnetic RF field
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Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Technical data

EMC data

Standards/regulations	EN 61000-4-3
Evaluation criterion	A
Designation	Fast transients (burst)
Standards/regulations	EN 61000-4-4
Evaluation criterion	A
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Evaluation criterion	A

Standards and Regulations

Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4
Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
Evaluation criterion	A
Standards/regulations	EN 61000-4-4
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Evaluation criterion	A
Designation	GB Standard
Standards/regulations	GB 3626.20
	GB 3836.1
	GB 3836.4
	GB 3836.8
	GB 12476.1
	GB 12476.4
Electrical isolation	3-way isolation
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
Group	IIC
Max. external inductivity L_o	300 mH
Max. external capacitance C_o	3.6 μ F
Additional text	simple circuit
Group	IIC
Max. external inductivity L_o	100 mH
Max. external capacitance C_o	510 nF
Additional text	mixed circuit
Group	IIC

Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Technical data

Standards and Regulations

Max. external inductivity L_o	50 mH
Max. external capacitance C_o	580 nF
Additional text	mixed circuit
Group	IIC
Max. external inductivity L_o	5 mH
Max. external capacitance C_o	600 nF
Additional text	mixed circuit
Group	IIC
Max. external inductivity L_o	1 mH
Max. external capacitance C_o	600 nF
Additional text	mixed circuit
Group	IIC
Max. external inductivity L_o	10 μ H
Max. external capacitance C_o	600 nF
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	1000 mH
Max. external capacitance C_o	26 μ F
Additional text	simple circuit
Group	IIB/IIIC
Max. external inductivity L_o	100 mH
Max. external capacitance C_o	1 μ F
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	5 mH
Max. external capacitance C_o	1 μ F
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	1 mH
Max. external capacitance C_o	1 μ F
Additional text	mixed circuit
Group	IIB/IIIC
Max. external inductivity L_o	10 μ H
Max. external capacitance C_o	1 μ F
Additional text	mixed circuit
Safety-related maximum voltage U_m	253 V AC/DC (Supply terminals)

Conformance/approvals

Designation	CE
Certificate	CE-compliant

Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Technical data

Conformance/approvals

Additional text	and EN 61326
Designation	ATEX
Identification	# II (1) G [Ex ia Ga] IIC
	# II (1) D [Ex ia Da] IIIC
	# II 3(1) G Ex nA nC [ia Ga] IIC T4 Gc X
Certificate	IBExU 10 ATEX 1005
Designation	IECEX
Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA nC [ia Ga] IIC T4 Gc
Certificate	IECEX IBE 10.0002X
Designation	CCC / China-Ex
Identification	[Ex ia Ga] IIC
	[Ex iaD]
	Ex nA nC [ia Ga] IIC T4 Gc
Certificate	NEPSI GYJ20.1312X
Designation	UL, USA / Canada
Identification	Class I Div 2; IS for Class I, II, III Div 1
Certificate	#, C.D.-No 83104549
Designation	Shipbuilding approval
Certificate	DNV GL TAA000020C
Designation	Safety Integrity Level (SIL, IEC 61508)
Identification	2
Designation	INMETRO
Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA nC [ia Ga] IIC T4 Gc
Certificate	DNV 18.0116 X
Designation	EAC Ex
Identification	# [Ex ia Ga] IIC
	# [Ex ia Da] IIIC
Certificate	RU C-DE.AB72.B.00093/19
Temperature	B
Humidity	B
Vibration	A
EMC	A
Enclosure	Required protection according to the Rules shall be provided upon installation on board

Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
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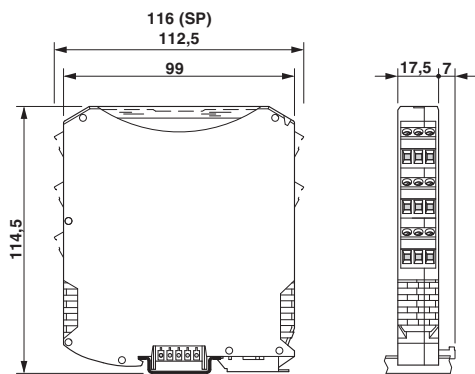
Technical data

Environmental Product Compliance

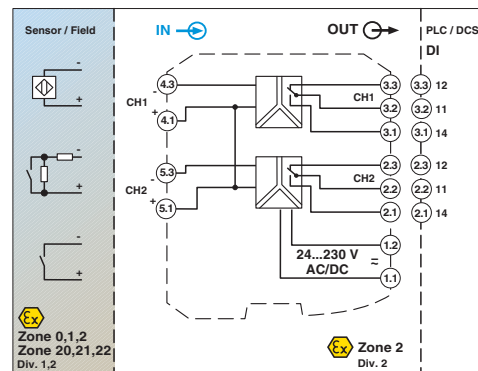
China RoHS	Environmentally Friendly Use Period = 50 years
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

Drawings

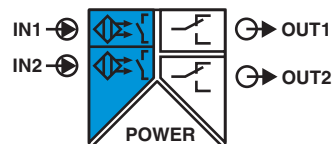
Dimensional drawing



Block diagram

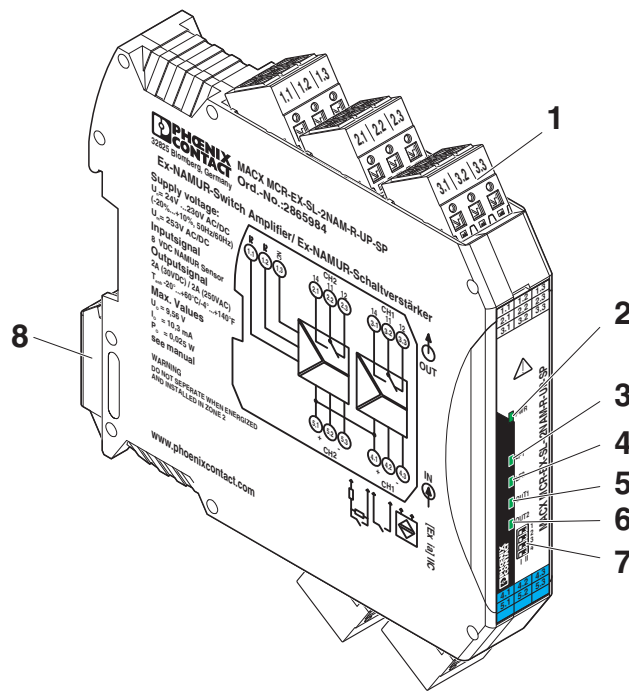


Pictogram



Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Schematic diagram



Classifications

eCl@ss

eCl@ss 10.0.1	27210121
eCl@ss 11.0	27210121
eCl@ss 4.0	27210100
eCl@ss 4.1	27210100
eCl@ss 5.0	27210100
eCl@ss 5.1	27210100
eCl@ss 6.0	27210100
eCl@ss 7.0	27210121
eCl@ss 9.0	27210121

ETIM

ETIM 2.0	EC001485
ETIM 3.0	EC001485
ETIM 4.0	EC001485
ETIM 6.0	EC001485
ETIM 7.0	EC001485

Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Classifications

UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008
UNSPSC 18.0	39121008
UNSPSC 19.0	39121008
UNSPSC 20.0	39121008
UNSPSC 21.0	39121008

Approvals

Approvals

Approvals

DNV GL / UL Listed / cUL Listed / CCC / Functional Safety / cULus Listed

Ex Approvals

ATEX / INMETRO / IECEx / UL Listed / cUL Listed / EAC Ex / cULus Listed

Approval details

DNV GL		https://approvalfinder.dnvgl.com/	TAA000020C
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UL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 330267
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cUL Listed		http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm	FILE E 330267
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CCC			2020322 316001515
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Functional Safety			09/12-02 R010 V1R0
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Approvals

cULus Listed



Accessories

Accessories

Component terminal block

Component terminal block - UKK 5-2R/NAMUR - 2941662



Double-level terminal block, with preassembled resistors

Device marking

Plastic label - UC-EMLP (11X9) - 0819291



Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Plastic label - UC-EMLP (11X9) YE - 0822602



Plastic label, Sheet, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Plastic label - UC-EMLP (11X9) SR - 0828094



Plastic label, Sheet, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Accessories

Plastic label - US-EMLP (11X9) - 0828789



Plastic label, Card, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

Plastic label - US-EMLP (11X9) YE - 0828871



Plastic label, Card, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

Plastic label - US-EMLP (11X9) SR - 0828872



Plastic label, Card, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

Device marker - LS-EMLP (11X9) WH - 0831678



Device marker, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

Device marker - LS-EMLP (11X9) SR - 0831705



Device marker, Sheet, silver, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255

Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Accessories

Device marker - LS-EMLP (11X9) YE - 0831732

Device marker, Sheet, yellow, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255



End cover

End cover - D-UKK 3/5 - 2770024



End cover, length: 56 mm, width: 2.5 mm, height: 52 mm, color: gray

End cover - D-UKK 3/5 BU - 2770105



End cover, length: 56 mm, width: 2.5 mm, height: 62 mm, color: blue

Insulating sleeve

Insulating sleeve - MPS-IH WH - 0201663

Insulating sleeve, color: white



Insulating sleeve - MPS-IH RD - 0201676

Insulating sleeve, color: red



Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Accessories

Insulating sleeve - MPS-IH BU - 0201689

Insulating sleeve, color: blue



Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow



Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green



Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray



Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black



Labeled device marker

Isolation amplifier - MACX MCR-EX-SL-2NAM-R-UP-SP - 2924249

Accessories

Plastic label - UC-EMLP (11X9) CUS - 0824547



Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

Plastic label - UC-EMLP (11X9) YE CUS - 0824548



Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

Plastic label - UC-EMLP (11X9) SR CUS - 0828098



Plastic label, can be ordered: by sheet, silver, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

Test plug terminal block

Test plugs - MPS-MT - 0201744



Test plugs, with solder connection up to 1 mm² conductor cross section, color: gray

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