

Isolation amplifier - MACX MCR-EX-SL-NAM-HO - 2907404

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Ex i NAMUR signal conditioners. For operating Ex i proximity sensors and switches in hazardous areas. Passive transistor output (resistive, Honeywell-compatible), line fault transparency, up to SIL 2 according to IEC 61508; screw connection.

Your advantages

- ✓ Signal input: intrinsically safe [Ex ia]; for NAMUR proximity sensors (EN 60947-5-6) or switch contacts
- ✓ Signal output with resistive behavior (transistor), compatible with FC-RUSIO-3224 and FC-RUSLS-3224 universal safety IO modules from Honeywell
- ✓ Signal output with line fault transparency, line fault indication directly via the signal output
- ✓ Up to 5 kHz switching frequency
- ✓ Direction of operation can be selected
- ✓ Line fault detection (LFD) can be enabled and disabled
- ✓ SIL 2 according to IEC 61508/EN 61508
- ✓ 3-way electrical isolation
- ✓ Power supply and error indication possible via DIN rail connector
- ✓ Plug-in connection terminals, screw connection technology
- ✓ Installation in zone 2 permitted
- ✓ Housing width: 12.5 mm



Key Commercial Data

| | |
|--------------------------------------|---------------|
| Packing unit | 1 pc |
| GTIN | |
| GTIN | 4055626200309 |
| Weight per Piece (excluding packing) | 540.000 g |
| Custom tariff number | 85437090 |
| Country of origin | Germany |

Isolation amplifier - MACX MCR-EX-SL-NAM-HO - 2907404

Technical data

Note

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

Dimensions

| | |
|--------|----------|
| Width | 12.5 mm |
| Height | 112.5 mm |
| Depth | 114.5 mm |

Ambient conditions

| | |
|---|--|
| Ambient temperature (operation) | -20 °C ... 60 °C (Any mounting position) |
| 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 (EN 60947-5-6) |
| Switching hysteresis | < 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 | Resistive (transistor, passive) compatible with FC-RUSIO-3224 and FC-RUSLS-3224 |
|------------------|---|

Power supply

| | |
|------------------------|--|
| Nominal supply voltage | 24 V DC |
| Supply voltage range | 9.6 V DC ... 30 V DC (12 V DC ... 24 V DC (-20 % ... +25 %)) |
| Power dissipation | < 0.6 W |
| Power consumption | < 600 mW |

Connection data

| | |
|----------------------------------|---|
| Connection method | Screw connection |
| Stripping length | 7 mm |
| Conductor cross section solid | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross section flexible | 0.2 mm ² ... 2.5 mm ² |

Isolation amplifier - MACX MCR-EX-SL-NAM-HO - 2907404

Technical data

Connection data

| | |
|-----------------------------|-------------------|
| Conductor cross section AWG | 24 ... 14 |
| Torque | 0.5 Nm ... 0.6 Nm |

Connection data 2

| | |
|-----------------|-------------|
| Connection name | Test socket |
| Max. diameter | 2.3 mm |

General

| | |
|-------------------------------|---|
| No. of channels | 1 |
| Status display | Green LED (supply voltage) LED yellow (switching state) Red LED (line errors) |
| Degree of pollution | 2 |
| Overvoltage category | II |
| 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) |
| Designation | Input/output/supply, DIN rail connector |
| Rated insulation voltage | 300 V _{rms} |
| Test voltage | 2.5 kV AC (50 Hz, 1 min.) |
| Insulation | Safe isolation in accordance with IEC/EN 61010-1 |
| Designation | Input/supply, DIN rail connector |
| Electrical isolation | 375 V (Peak value in accordance with IEC/EN 60079-11) |

Safety characteristic data

| | |
|------------------------------|---|
| Safety Integrity Level (SIL) | 2 |
| | 2 |

Safety data

| | |
|--|------------|
| Max. internal inductance L _i | negligible |
| Max. internal capacitance C _i | negligible |
| Max. output voltage U _o | 9.6 V |
| Max. output current I _o | 10 mA |
| Max. output power P _o | 25 mW |
| Group | IIC |
| Max. external inductivity L _o | 300 mH |

Isolation amplifier - MACX MCR-EX-SL-NAM-HO - 2907404

Technical data

Safety data

| | |
|---------------------------------|----------------|
| 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 |
| 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/IIA/IIIC |
| Max. external inductivity L_o | 100 mH |
| Max. external capacitance C_o | 1 μ F |
| Additional text | mixed circuit |
| Group | IIB/IIA/IIIC |
| Max. external inductivity L_o | 5 mH |
| Max. external capacitance C_o | 1 μ F |
| Additional text | mixed circuit |
| Group | IIB/IIA/IIIC |
| Max. external inductivity L_o | 1 mH |

Isolation amplifier - MACX MCR-EX-SL-NAM-HO - 2907404

Technical data

Safety data

| | |
|--------------------------------------|---------------|
| Max. external capacitance C_o | 1 μ F |
| Additional text | mixed circuit |
| Group | IIB/IIA/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 |

Standards and Regulations

| | |
|-------------------------------|-------------------------------------|
| Electromagnetic compatibility | Conformance with EMC directive |
| Noise emission | EN 61000-6-4 |
| Designation | GB Standard |
| Standards/regulations | GB 3626.20 |
| | GB 3836.1 |
| | GB 3836.4 |
| | GB 3836.8 |
| | GB 12476.1 |
| | GB 12476.4 |
| Conformance | CE-compliant, additionally EN 61326 |
| ATEX | # II (1) G [Ex ia Ga] IIC |
| | # II (1) D [Ex ia Da] IIIC |
| | # II 3G Ex nA IIC T4 Gc X |
| IECEX | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex nA IIC T4 Gc |
| UL, USA/Canada | UL 61010 Listed |
| Group | IIC |
| | IIC |
| | IIC |
| | IIC |
| | IIC |
| | IIC |

Conformance/approvals

| | |
|-----------------|--------------|
| Designation | CE |
| Identification | CE-compliant |
| Additional text | and EN 61326 |
| Designation | ATEX |

Isolation amplifier - MACX MCR-EX-SL-NAM-HO - 2907404

Technical data

Conformance/approvals

| | |
|----------------|---|
| Identification | # II (1) G [Ex ia Ga] IIC |
| | # II (1) D [Ex ia Da] IIIC |
| | # II 3G Ex nA IIC T4 Gc X |
| Certificate | IBExU 12 ATEX 1169 |
| Designation | IECEX |
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex nA IIC T4 Gc |
| Certificate | IECEX IBE 12.0018X |
| Designation | CCC / China-Ex |
| Identification | [Ex ia Ga] IIC |
| | [Ex iaD] |
| | Ex nA [ia Ga] IIC T4 Gc |
| Certificate | NEPSI GYJ20.1314X |
| Designation | UL, USA/Canada |
| Identification | UL 61010 Listed |
| Certificate | #, C.D.-No 83104549 |
| Designation | Safety Integrity Level (SIL, IEC 61508) |
| Identification | 2 |
| Designation | EAC Ex |
| Identification | # [Ex ia Ga] IIC |
| | # [Ex ia Da] IIIC |
| Certificate | RU C-DE.AB72.B.00093/19 |
| Designation | INMETRO |
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex nA IIC T4 Gc |
| Certificate | DNV 18.0144 X |

Environmental Product Compliance

| | |
|------------|---|
| REACH SVHC | Lead 7439-92-1 |
| China RoHS | Environmentally Friendly Use Period = 50 years |
| | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

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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 |

UNSPSC

| | |
|-------------|----------|
| UNSPSC 13.2 | 39121008 |
| UNSPSC 18.0 | 39121008 |
| UNSPSC 19.0 | 39121008 |
| UNSPSC 20.0 | 39121008 |
| UNSPSC 21.0 | 39121008 |

Approvals

Approvals

Approvals

Functional Safety / CCC

Ex Approvals


IECEX / ATEX / EAC Ex / ATEX / INMETRO

Approval details

Isolation amplifier - MACX MCR-EX-SL-NAM-HO - 2907404

Approvals

| | |
|-------------------|------------------------|
| Functional Safety | 12/06-054 R016 V2R0 |
|-------------------|------------------------|

| | | |
|-----|---|-------------------|
| CCC |  | 2020322 316001584 |
|-----|---|-------------------|