

MACX MCR-EX-SL-UI-REL - Limit value switch



2906164

<https://www.phoenixcontact.com/us/products/2906164>

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Limit value switch with Ex i input for active current and voltage signals and a limit-value relay output (changeover contact). Can be set via DIP switch and potentiometer, galvanic 3-way electrical isolation, up to SIL2 (SC3), PLc Cat.1, screw connection.

Commercial data

| | |
|--------------------------------------|---------------|
| Item number | 2906164 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | C430 |
| Product key | DK1217 |
| GTIN | 4055626043173 |
| Weight per piece (including packing) | 255.2 g |
| Weight per piece (excluding packing) | 250 g |
| Customs tariff number | 85437090 |
| Country of origin | DE |

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Technical data

Product properties

| | |
|----------------|--------------------|
| Product type | Limit value switch |
| Product family | MACX Analog |
| Configuration | DIP switches |
| | Potentiometer |

System properties

Functionality

| | |
|---------------|---------------|
| Configuration | DIP switches |
| | Potentiometer |

Electrical properties

| | |
|---|-----------------|
| Electrical isolation | 3-way isolation |
| Electrical isolation between input and output | yes |
| Switching point accuracy | < 0.1 % |
| Step response (0–99%) | ≤ 22 ms |
| Maximum temperature coefficient | 0.01 %/K |
| Maximum transmission error | 0.1 % |

Electrical isolation

| | |
|----------------------|-------------------------|
| Test voltage | 2.5 kV AC (50 Hz, 60 s) |
| Overvoltage category | II |
| Pollution degree | 2 |

Electrical isolation Output/supply IEC/EN 60079-11

| | |
|--------------------------|-----------------|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 250 V AC |

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

| | |
|--------------------------|----------------|
| Standards/regulations | IEC/EN 61010-1 |
| Rated insulation voltage | 300 V AC |
| Insulation | Safe isolation |

Electrical isolation Input/output, power supply IEC/EN 60079-11

| | |
|--------------------------|-----------------|
| Standards/regulations | IEC/EN 60079-11 |
| Rated insulation voltage | 375 V AC |

Supply

| | |
|------------------------------|-------------------------------------|
| Nominal supply voltage range | 12 V DC ... 24 V DC -20 % ... +25 % |
| Supply voltage range | 9.6 V DC ... 30 V DC |
| Typical current consumption | 38 mA (24 V DC) |
| Max. current consumption | 90 mA (10 V DC) |
| Power dissipation | < 0.9 W |

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| | |
|-------------------|---------|
| Power consumption | ≤ 1.2 W |
|-------------------|---------|

Input data

Signal: Voltage/current

| | |
|--|---|
| Description of the input | intrinsically safe |
| Voltage input signal | 0.1 V ... 10 V 0.1 V ... 10.5 V (Maximum range) |
| Total error of the voltage input maximum | ± 10 mV |
| Current input signal | 0.2 mA ... 20 mA 0.18 mA ... 21 mA (Maximum range) |
| Total error of the current input maximum | ± 20 µA |
| Input resistance of voltage input | > 100 kΩ |
| Input resistance current input | < 28 Ω |
| Switching threshold "0" signal current | Configurable via DIP switch (in 1.25% increments) and potentiometer (linearly up to 2% of the switching threshold set via the DIP switch) |
| Switching hysteresis | off: approx. 0.5 %, on: approx. 1 % |
| Line fault detection | < 0.1 mA (Line break) > 21.1 mA (Short circuit) |

Output data

Switching: Relay

| | |
|------------------------|--|
| Contact switching type | 1 changeover contact |
| Contact material | AgSnO ₂ , hard gold-plated |
| Max. switching current | ≤ 4 A AC (cos phi = 1) ≤ 1 A DC (ohmic load, 24 V DC, 50 mW) ≤ 0.2 A DC (ohmic load, 120 V DC) |

Connection data

| | |
|----------------------------------|---|
| Connection method | Screw connection |
| Stripping length | 7 mm |
| Screw thread | M3 |
| Conductor cross-section rigid | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross-section flexible | 0.2 mm ² ... 2.5 mm ² |
| Conductor cross-section AWG | 24 ... 14 |
| Tightening torque | 0.5 Nm ... 0.6 Nm |

Test socket

| | |
|---------------|------|
| Max. diameter | 2 mm |
|---------------|------|

Ex data

| | |
|-----------------------|----------------------|
| Ex installation (EPL) | Gc Div. 2 [Ga] |
|-----------------------|----------------------|

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| | |
|---------------------|----------|
| Ex i circuits (EPL) | [Da] |
| | [Ma] |
| | [Div. 1] |

Safety data

| | |
|---|--|
| Input voltage U_i | 30 V (Current and voltage input) |
| Input current I_i | 120 mA (Current and voltage input) |
| Input power P_i | 0.9 W (Current and voltage input) |
| Max. internal inductance L_i | negligible |
| Max. internal capacitance C_i | 75 nF (for current input) |
| | Negligible at voltage input |
| Max. output voltage U_o | 0 V DC (Current input) |
| | 3.9 V DC (Voltage input) |
| Max. output current I_o | 0 mA (Current input) |
| | 0.1 mA (Voltage input) |
| Max. output power P_o | 0 mW (Current input) |
| | 0.5 mW (Voltage input) |
| Safety-related maximum voltage U_m | 253 V AC |
| | 125 V DC |
| IIC: Max. external inductivity L_o / Max. external capacitance C_o | 100 mH / 3.3 μ F, 5 mH / 4.7 μ F, 1 mH / 6.3 μ F |
| IIB/IIIC: Max. external inductivity L_o / Max. external capacitance C_o | 100 mH / 16 μ F, 5 mH / 24 μ F, 1 mH / 35 μ F |
| IIA/I: Max. external inductivity L_o / Max. external capacitance C_o | 100 mH / 24 μ F, 5 mH / 35 μ F, 1 mH / 48 μ F |

Signaling

| | |
|----------------|---|
| Status display | Green LED (supply voltage) |
| | Yellow LED (switching output) |
| | Red LED, flashing (line, sensor error, ERR) |

Dimensions

| | |
|---------------------|--|
| Dimensional drawing | |
| Width | 12.5 mm |
| Height | 112.5 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) |

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| | |
|------------------|-----------|
| Housing material | PA 6.6-FR |
|------------------|-----------|

Environmental and real-life conditions

Ambient conditions

| | |
|---|--|
| Degree of protection | IP20 |
| Ambient temperature (operation) | -20 °C ... 65 °C (Any mounting position) |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Altitude | ≤ 2000 m |
| Permissible humidity (operation) | 5 % ... 95 % (non-condensing) |

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 nC [ia Ga] IIC T4 Gc |
| | ⊕ I (M1) [Ex ia Ma] I |
| Certificate | TÜV 17 ATEX 8061 X |

IECEX

| | |
|----------------|----------------------------|
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex ec nC [ia Ga] IIC T4 Gc |
| Certificate | IECEX TUR 18.0014X |

CCC / China-Ex

| | |
|----------------|----------------------------|
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex ec nC [ia Ga] IIC T4 Gc |
| Certificate | 2022122316115960 |

UL, USA/Canada

| | |
|----------------|--|
| Identification | UL 61010 Listed |
| | 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 |
| Certificate | TÜV Rheinland 968/FSP 1481.01/23 |

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Systematic Capability

| | |
|----------------|---|
| Identification | 3 |
|----------------|---|

Performance Level (ISO 13849)

| | |
|----------------|---|
| Identification | c |
|----------------|---|

INMETRO

| | |
|----------------|----------------------------|
| Identification | [Ex ia Ga] IIC |
| | [Ex ia Da] IIIC |
| | Ex ec nC [ia Ga] IIC T4 Gc |
| Certificate | DNV 21.0089 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 |
| Note | When being exposed to interference, there may be minimal deviations. |

Noise emission

| | |
|-----------------------|--------------|
| Standards/regulations | EN 61000-6-4 |
|-----------------------|--------------|

Standards and regulations

| | |
|----------------------|-----------------|
| Electrical isolation | 3-way isolation |
|----------------------|-----------------|

GB Standard

| | |
|-----------------------|-------------|
| Standards/regulations | GB/T 3836.1 |
| | GB/T 3836.3 |
| | GB/T 3836.4 |
| | GB/T 3836.8 |

Mounting

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

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Drawings

Dimensional drawing



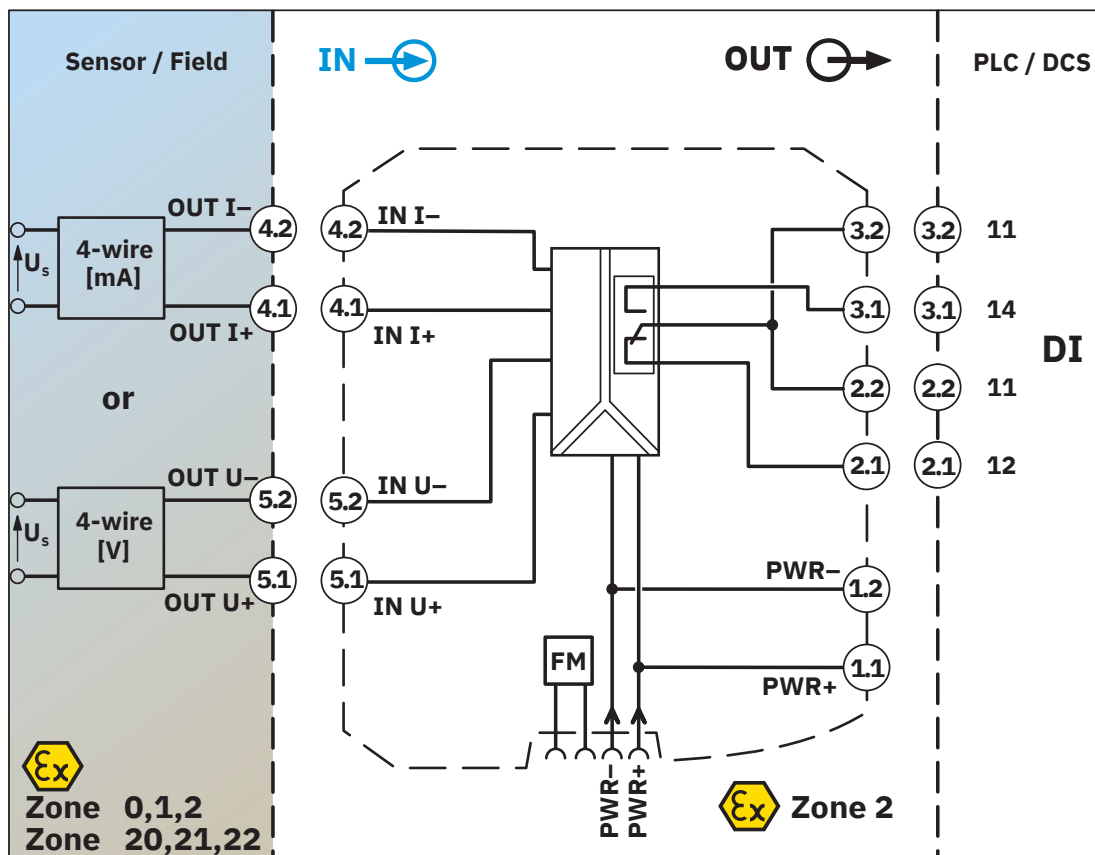
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Block diagram



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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2906164>

DNV

Approval ID: TAA000020C



UL Listed

Approval ID: E330267



cUL Listed

Approval ID: FILE E 330267



Functional Safety

Approval ID: 968/FSP 1481.00/17



EAC Ex

Approval ID: RU C-DE.HB49.B.00145



IECEX

Approval ID: IECEX TUR 18.0014X



CCC

Approval ID: 2022122316115960



cUL Listed

Approval ID: FILE E 199827



UL Listed

Approval ID: E199827

INMETRO

Approval ID: DNV 21.0089 X



ATEX

Approval ID: TÜV 17 ATEX 8061 X

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-13.0 | 27210120 |
| ECLASS-15.0 | 27210120 |

ETIM

| | |
|-----------|----------|
| ETIM 10.0 | EC002653 |
|-----------|----------|

UNSPSC

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

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Environmental product compliance

EU RoHS

| | |
|---|--------------------|
| Fulfills EU RoHS substance requirements | Yes |
| Exemption | 6(c), 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 | 87a1b338-32c7-4bf1-88fb-598c3574a9b8 |

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