

# MACX MCR-EX-SL-IDS-I-SP - Output signal conditioner



2924032

<https://www.phoenixcontact.com/us/products/2924032>

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Ex i output signal conditioner, HART. Isolates and transmits 0/4 - 20 mA signals with intrinsic safety to a load (I/P converters, regulating valves, displays) in the Ex area. Open-circuit detection, SIL 2 in accordance with IEC 61508, spring-cage connection. Replacement item: 2908062 MACX MCR-EX-IDS-I-SP.

## Your advantages

- Power supply possible via DIN rail connector
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- Up to SIL 2 in accordance with EN 61508
- Line fault detection (LFD)
- Output: 0/4 mA ... 20 mA, [Ex ia] IIC
- Bidirectional transmission of digital HART communication signals
- Plug-in screw or spring-cage connection technology (Push-in technology), with integrated sockets for HART communicators
- Input: 0/4 mA ... 20 mA
- 3-way electrical isolation

## Commercial data

|                                      |                                |
|--------------------------------------|--------------------------------|
| Item number                          | 2924032                        |
| Packing unit                         | 1 pc                           |
| Note                                 | Made to order (non-returnable) |
| Sales key                            | C430                           |
| Product key                          | DK1212                         |
| GTIN                                 | 4046356337342                  |
| Weight per piece (including packing) | 170.9 g                        |
| Weight per piece (excluding packing) | 137.8 g                        |
| Customs tariff number                | 85437090                       |
| Country of origin                    | DE                             |

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## Technical data

### Product properties

|                 |                           |
|-----------------|---------------------------|
| Product type    | Output signal conditioner |
| Application     | Analog OUT                |
| No. of channels | 1                         |

### Insulation characteristics

|                      |    |
|----------------------|----|
| Overvoltage category | II |
| Pollution degree     | 2  |

### Electrical properties

|   |                                    |
|---|------------------------------------|
| Electrical isolation                          | 3-way isolation                    |
| Electrical isolation between input and output | yes                                |
| Signal transmission behavior                  | In = Out                           |
| Step response (10-90%)                        | < 140 µs (for 4 mA ... 20 mA step) |
| Maximum temperature coefficient               | < 0.01 %/K                         |
| Maximum transmission error                    | < 0.1 % (of final value)           |

### Electrical isolation Input/output/power supply

|              |                         |
|--------------|-------------------------|
| Test voltage | 1.5 kV AC (50 Hz, 60 s) |
|--------------|-------------------------|

### Electrical isolation Output/input

|                      |   |
|----------------------|---|
| Electrical isolation | 375 V (Peak value in accordance with IEC/EN 60079-11) |
|----------------------|---|

### Electrical isolation Output/supply

|                      |   |
|----------------------|---|
| Electrical isolation | 375 V (Peak value in accordance with IEC/EN 60079-11) |
|----------------------|---|

### Supply

|                          |  |
|--------------------------|--|
| Nominal supply voltage   | 24 V DC  |
| Supply voltage range     | 19.2 V DC ... 30 V DC (24 V DC, -20 % ... +25 %) |
| Max. current consumption | < 46 mA (24 V DC / 20 mA)                        |
| Power dissipation        | < 1.1 W (24 V DC / 20 mA)                        |

## Input data

### Signal: Current

|                      |                                     |
|----------------------|-------------------------------------|
| Number of inputs     | 1                                   |
| Current input signal | 0 mA ... 20 mA<br>4 mA ... 20 mA    |
| Input impedance      | > 100 kΩ (If there is a line fault) |
| Voltage drop         | 5.4 V (20 mA)                       |

## Output data

### Signal: Current

|                    |                |
|--------------------|----------------|
| Output description | Current output |
|--------------------|----------------|

# MACX MCR-EX-SL-IDS1-I-SP - Output signal conditioner



2924032

<https://www.phoenixcontact.com/us/products/2924032>

|                                 |  |
|---------------------------------|--|
| Number of outputs               | 1  |
| Current output signal           | 0 mA ... 20 mA (intrinsically safe)<br>4 mA ... 20 mA (intrinsically safe) |
| Load/output load current output | < 800 $\Omega$ (20 mA)<br>< 730 $\Omega$ (22.5 mA)                         |
| Output ripple                   | < 20 mV <sub>rms</sub>   |

## Connection data

|                                  |   |
|----------------------------------|---|
| Connection method                | Push-in connection                          |
| Stripping length                 | 8 mm  |
| Conductor cross-section rigid    | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross-section flexible | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross-section AWG      | 24 ... 16                                   |

## Ex data

### Safety data

|  |                     |
|--|---------------------|
| Max. output voltage $U_o$  | 27.7 V              |
| Max. output current $I_o$  | 92 mA               |
| Max. output power $P_o$  | 633 mW              |
| Safety-related maximum voltage $U_m$                                   | 253 V AC (125 V DC) |
| IIC: Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 2 mH / 85 nF        |
| IIB: Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 4 mH / 663 nF       |

## Interfaces

### Data communication (bypass)

|                     |      |
|---------------------|------|
| HART function       | Yes  |
| Protocols supported | HART |

## Signaling

|                |                            |
|----------------|----------------------------|
| Status display | Green LED (supply voltage) |
|----------------|----------------------------|

## Dimensions

|                     |          |
|---------------------|----------|
| Dimensional drawing |          |
| Width               | 12.5 mm  |
| Height              | 116 mm   |
| Depth               | 114.5 mm |

## Material specifications

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|  |                 |
|--|-----------------|
| Color  | gray (RAL 7042) |
| Flammability rating according to UL 94 (Housing) | V0 (Housing)    |
| Housing material                                 | PA 6.6-FR       |

## Characteristics

Safety data: IEC 61508 - High demand

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

Safety data: IEC 61508 - Low demand

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

## Environmental and real-life conditions

Ambient conditions

|   |  |
|---|--|
| Degree of protection                    | IP20 (not assessed by UL)                |
| Ambient temperature (operation)         | -20 °C ... 60 °C (Any mounting position) |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C                         |
| Altitude                                | ≤ 2000 m                                 |
| Permissible humidity (operation)        | 10 % ... 95 % (non-condensing)           |

## Approvals

CE

|             |              |
|-------------|--------------|
| Certificate | CE-compliant |
| Note        | and EN 61326 |

ATEX

|                |   |
|----------------|---|
| Identification | Ⓜ II (1) G [Ex ia Ga] IIC/IIB           |
|                | Ⓜ II (1) D [Ex ia Da] IIIC              |
|                | Ⓜ II 3(1) G Ex nA [ia Ga] IIC/IIB T4 Gc |
| Certificate    | BVS 08 ATEX E 074 X                     |

IECEX

|                |                             |
|----------------|-----------------------------|
| Identification | [Ex ia Ga] IIC/IIB          |
|                | [Ex ia Da] IIIC             |
|                | Ex nA [ia Ga] IIC/IIB T4 Gc |
| Certificate    | IECEX BVS 08.0025 X         |

UL, USA/Canada

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

KC-s

|                |                 |
|----------------|-----------------|
| Identification | [Ex ia] IIC/IIB |
| Certificate    | 17-KA4BO-0413X  |

Shipbuilding approval

|             |                   |
|-------------|-------------------|
| Certificate | DNV GL TAA00000AG |
|-------------|-------------------|

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<https://www.phoenixcontact.com/us/products/2924032>

## Safety Integrity Level (SIL, IEC 61508)

|                |   |
|----------------|---|
| Identification | 2 |
|----------------|---|

## EAC Ex

|                |   |
|----------------|---|
| Identification | Ex [Ex ia Ga] IIC<br>Ex [Ex ia Da] IIIC |
| Certificate    | RU C-DE.AB72.B.00093/19                 |

## Shipbuilding data

|             |   |
|-------------|---|
| Temperature | B   |
| Humidity    | B   |
| Vibration   | A   |
| EMC         | B   |
| 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 |
|-----------------------|--------------|

## Electromagnetic HF field

|  |                          |
|--|--------------------------|
| Designation  | Electromagnetic RF field |
| Standards/regulations                                  | EN 61000-4-3             |
| Typical deviation from the measuring range final value | 1 %                      |

## Fast transients (burst)

|  |                         |
|--|-------------------------|
| Designation  | Fast transients (burst) |
| Standards/regulations                                  | EN 61000-4-4            |
| Typical deviation from the measuring range final value | 1 %                     |

## Conducted interference

|  |                         |
|--|-------------------------|
| Designation  | Conducted interferences |
| Standards/regulations                                  | EN 61000-4-6            |
| Typical deviation from the measuring range final value | 1 %                     |

## Standards and regulations

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

## Mounting

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

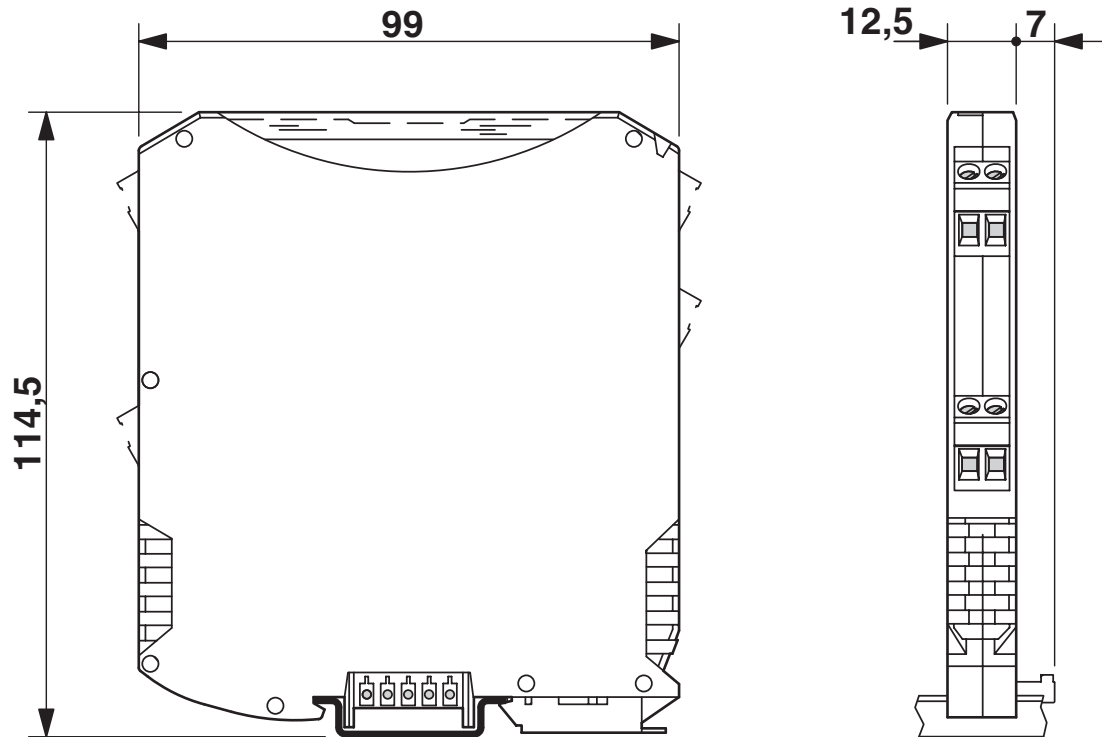
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## Drawings

Dimensional drawing



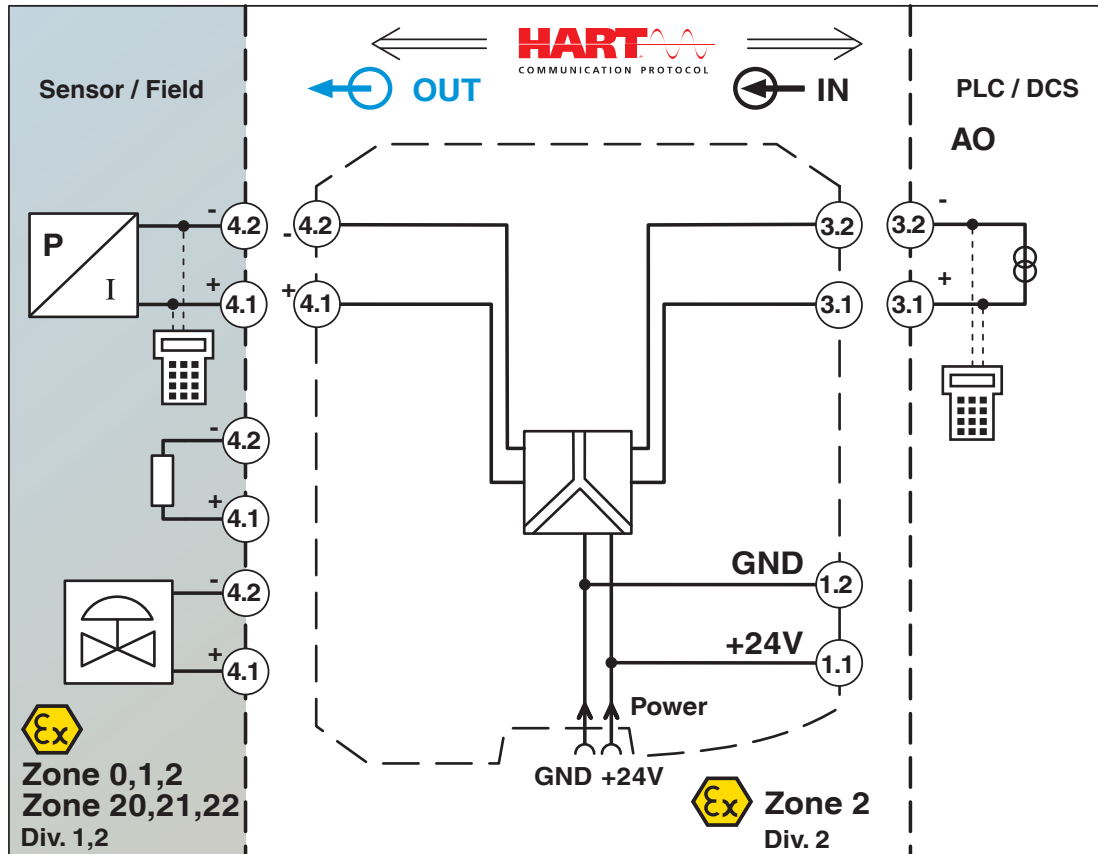
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Block diagram



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## Classifications

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121008 |
|-------------|----------|

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## 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.) | No substance above 0.1 wt% |
|-------------------------------------|----------------------------|

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