

# MACX MCR-EX-AP-RTD-RTD-SP - Temperature measuring transducer



1291955

<https://www.phoenixcontact.com/us/products/1291955>

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Ex i-Resistance isolator for intrinsically safe operation of Pt 100 resistance thermometers in 2, 3, or 4-conductor technology and resistance-type sensors. The values measured at the Ex i input are transmitted 1:1 to the non Ex i output. number of channels: 1, Standard configuration, 3-way isolation, Push-in connection

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1291955       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | C430          |
| Product key                          | DK121W        |
| GTIN                                 | 4063151524289 |
| Weight per piece (including packing) | 178.5 g       |
| Weight per piece (excluding packing) | 22.22 g       |
| Customs tariff number                | 85437090      |
| Country of origin                    | DE            |

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## Technical data

### Notes

|                     |   |
|---------------------|---|
| Note on application | Accuracy, typically specified as a percentage of the basic measuring range at $U_N$ , 23°C                                  |
| Notes on operation  | Installation conditions influence the ambient temperature. Please refer to the "Control cabinet installation instructions". |
| Notes on operation  | Sensor set via DIP switches   |
| Notes on operation  | 2-conductor comparison set via DIP switch ADJ   |

### Product properties

|                 |                         |
|-----------------|-------------------------|
| Product type    | Temperature transmitter |
| Product family  | MACX Analog             |
| No. of channels | 1                       |

### Electrical properties

|   |                 |
|---|-----------------|
| Electrical isolation                          | 3-way isolation |
| Electrical isolation between input and output | yes             |
| Signal transmission behavior                  | In = Out        |
| Temperature coefficient, typical              | ≤ 0.1 % (10 K)  |
| Reverse polarity protection                   | yes             |

#### Electrical isolation Input/output IEC/EN 60079-11

|                          |                     |
|--------------------------|---------------------|
| Standards/regulations    | IEC/EN 60079-11     |
| Rated insulation voltage | 375 V <sub>PP</sub> |

#### Electrical isolation Input/power supply IEC/EN 60079-11

|                          |                     |
|--------------------------|---------------------|
| Standards/regulations    | IEC/EN 60079-11     |
| Rated insulation voltage | 375 V <sub>PP</sub> |

#### Electrical isolation Input/error message output IEC/EN 60079-11

|                          |                     |
|--------------------------|---------------------|
| Standards/regulations    | IEC/EN 60079-11     |
| Rated insulation voltage | 375 V <sub>PP</sub> |

#### Electrical isolation Input/configuration interface IEC/EN 60079-11

|                          |                     |
|--------------------------|---------------------|
| Standards/regulations    | IEC/EN 60079-11     |
| Rated insulation voltage | 375 V <sub>PP</sub> |

#### Electrical isolation Output 1/output 2

|              |                     |
|--------------|---------------------|
| Test voltage | 350 V (50 Hz, 60 s) |
|--------------|---------------------|

#### Electrical isolation Output/supply

|              |                     |
|--------------|---------------------|
| Test voltage | 350 V (50 Hz, 60 s) |
|--------------|---------------------|

#### Electrical isolation Output/configuration interface

|              |                     |
|--------------|---------------------|
| Test voltage | 350 V (50 Hz, 60 s) |
|--------------|---------------------|

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## Electrical isolation Output/supply/error message output

|              |                     |
|--------------|---------------------|
| Test voltage | 350 V (50 Hz, 60 s) |
|--------------|---------------------|

## Supply

|                        |                 |
|------------------------|-----------------|
| Nominal supply voltage | 24 V DC         |
| Supply voltage range   | 18 V ... 31.2 V |
| Power dissipation      | ≤ 600 mW        |
| Power consumption      | ≤ 650 mW        |

## Input data

### Measurement

|   |   |
|---|---|
| Description of the input                      | intrinsically safe  |
| Sensor types (RTD) that can be used           | Pt 100  |
| Connection technology                         | 2-, 3-, 4-conductor   |
| Linear resistance measuring range             | 18 Ω ... 391 Ω (Pt 100)   |
| Max. permissible overall conductor resistance | ≤ 50 Ω (per wire, 2-conductor circuit)<br>≤ 100 Ω (per wire, 3-, 4-conductor circuit) |

## Output data

### Analog: Resistance thermometer

|                                |   |
|--------------------------------|---|
| Output signal Voltage          | 2 V DC (Nominal voltage)                |
| Output signal Current          | 5 mA (Nominal current)                  |
| Output signal Resistance       | 400 Ω                                   |
| Output signal Resistance range | 18 Ω ... 391 Ω (Pt 100)                 |
| Settling time                  | < 10 ms (10% ... 90%, multiplexer mode) |
| Setting range                  | < 1 s (Input/output)                    |
| Sensor input current           | 200 μA ... 5 mA                         |
| Connection technology          | 2-, 3-, 4-conductor                     |

### Signal: Error message output

|                           |        |
|---------------------------|--------|
| Maximum switching voltage | 30 V   |
| Max. switching current    | 100 mA |

## 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

|                       |    |
|-----------------------|----|
| Ex installation (EPL) | Gc |
|-----------------------|----|

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|                     |      |
|---------------------|------|
| Ex i circuits (EPL) | [Ga] |
|                     | [Da] |
|                     | [Ma] |

## Safety data

|  |   |
|--|---|
| Max. internal inductance $L_i$   | negligible  |
| Max. internal capacitance $C_i$  | negligible  |
| Max. output voltage $U_o$  | 6.5 V   |
| Max. output current $I_o$  | 16.5 mA   |
| Max. output power $P_o$  | 27 mW   |
| Safety-related maximum voltage $U_m$   | 253 V AC  |
| I/A (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$      | 900 mH / 1000 $\mu$ F   |
| IIB/IIIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 450 mH / 570 $\mu$ F  |
| IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$      | 120 mH / 25 $\mu$ F   |
| I (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$        | 1000 mH / 1000 $\mu$ F  |
| IIB/IIIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$  | 100 mH / 5.3 $\mu$ F, 20 mH / 6.9 $\mu$ F, 2 mH / 11 $\mu$ F, 0.5 mH / 15 $\mu$ F |
| IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$       | 50 mH / 1.1 $\mu$ F, 5 mH / 1.7 $\mu$ F, 1 mH / 2.3 $\mu$ F, 0.2 mH / 3.4 $\mu$ F |

## Signaling

|                |                            |
|----------------|----------------------------|
| Status display | Green LED (supply voltage) |
|                | Red LED (line errors)      |

## Dimensions

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Width               | 17.5 mm  |
| Height              | 107.8 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

|  |        |
|--|--------|
| Flammability rating according to UL 94 | V0     |
| Housing material                       | PA 6.6 |

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## Environmental and real-life conditions

### Ambient conditions

|   |  |
|---|--|
| Degree of protection                    | IP20 (Terminal blocks)   |
|   | IP30 (Housing)   |
| Ambient temperature (operation)         | -20 °C ... 70 °C (Stand-alone device: any mounting position)                   |
|   | -20 °C ... 60 °C (Group assembly: vertical DIN rail without circulating air)   |
|   | -20 °C ... 65 °C (Group assembly: vertical DIN rail with circulating air)      |
|   | -20 °C ... 65 °C (Group assembly: horizontal DIN rail without circulating air) |
|   | -20 °C ... 70 °C (Group assembly: horizontal DIN rail with circulating air)    |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C   |
| Altitude                                | ≤ 2000 m   |
| Permissible humidity (operation)        | ≤ 95 % (non-condensing)  |

## Approvals

### 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 |
|                | ⊕ I (M1) [Ex ia Ma] I                   |

### IECEX

|                |                            |
|----------------|----------------------------|
| Identification | [Ex ia Ga] IIC             |
|                | [Ex ia Da] IIIC            |
|                | Ex nA nC [ia Ga] IIC T4 Gc |
|                | [Ex ia Ma] I               |

## EMC data

|                               |   |
|-------------------------------|---|
| Electromagnetic compatibility | Tested in accordance with the following standards and regulations: EN 61326-1 For industrial use, NAMUR NE 21 |
|-------------------------------|---|

## Standards and regulations

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

## Mounting

|                   |                      |
|-------------------|----------------------|
| Mounting type     | NS 35/15, NS 35/7,5  |
| Mounting position | vertical, horizontal |

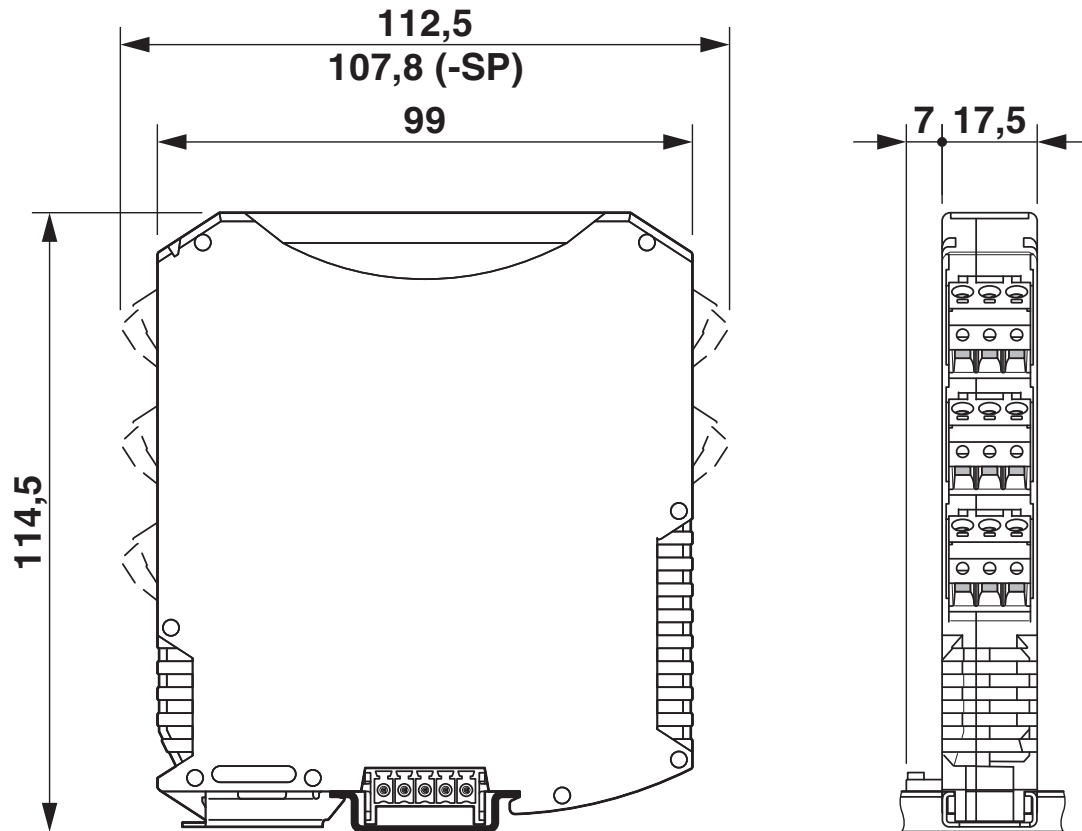
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## Drawings

Dimensional drawing

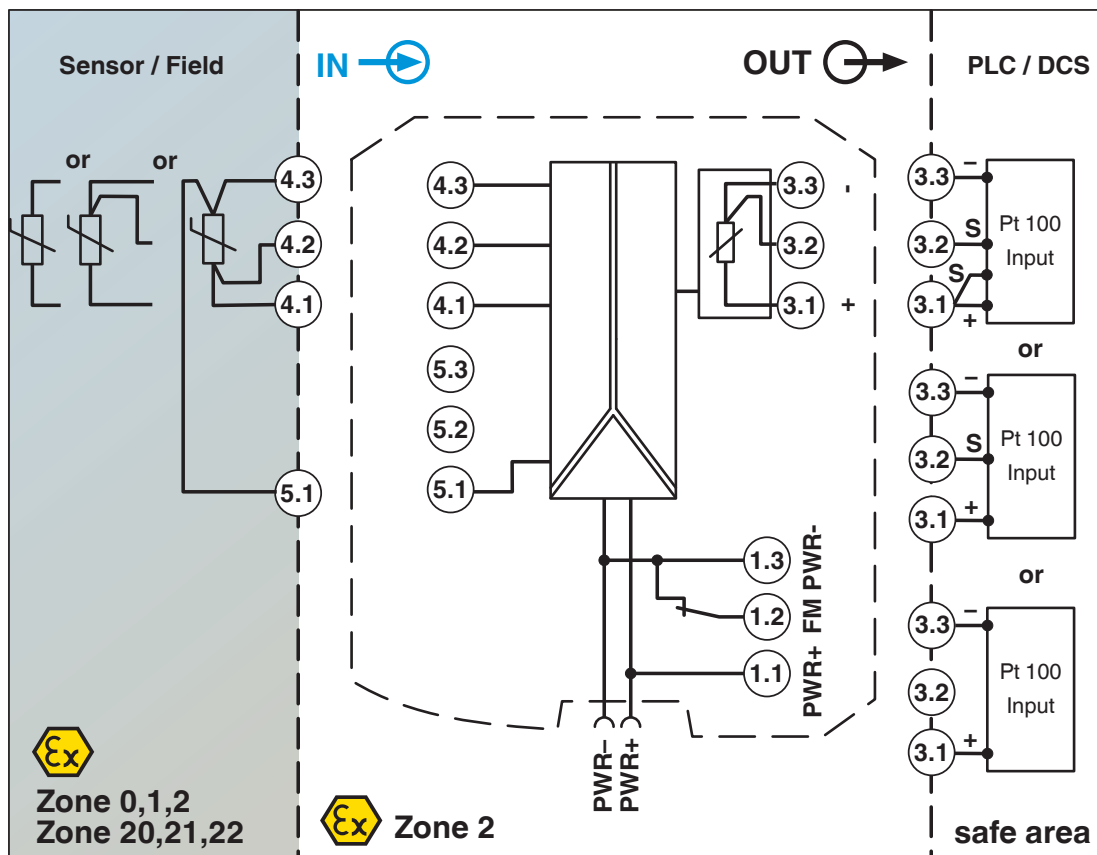


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Block diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1291955>



**IECEX**

Approval ID: IECEX BVS 21.0033X



**ATEX**

Approval ID: BVS 21 ATEX E 031X

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27210129 |
| ECLASS-15.0 | 27210129 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC002919 |
|-----------|----------|

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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 titanium zirconium oxide(CAS: 12626-81-2) |
|                                     | Lead(CAS: 7439-92-1)                           |
| SCIP                                | a361b992-65aa-4a08-8e43-f0cb9b6da872           |

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