

# MACX MCR-EX-AP-2F-2I - Frequency measuring transducer



1290530

<https://www.phoenixcontact.com/us/products/1290530>

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Ex i-Frequency transducer, the frequencies measured at the Ex i inputs (0.001 Hz ... 20 kHz) are output as 0 mA / 4 mA ... 20 mA non Ex i signals. number of channels: 2, Standard configuration, 5-way isolation, Screw connection

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1290530       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | C430          |
| Product key                          | DK121W        |
| GTIN                                 | 4063151522063 |
| Weight per piece (including packing) | 215.5 g       |
| Weight per piece (excluding packing) | 160 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  | Use suitable cables and cable glands for applications below - 20°C.   |

### Product properties

|                 |                             |
|-----------------|-----------------------------|
| Product type    | Frequency value transformer |
| Product family  | MACX Analog                 |
| No. of channels | 2                           |
| Configuration   | Software                    |

### System properties

#### Functionality

|               |          |
|---------------|----------|
| Configuration | Software |
|---------------|----------|

### Electrical properties

|   |                 |
|---|-----------------|
| Electrical isolation                          | 5-way isolation |
| Electrical isolation between input and output | yes             |
| Temperature coefficient, typical              | $\leq 0.05 \%$  |
| 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) |
|--------------|---------------------|

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## Electrical isolation Output/configuration interface

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

## 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      | ≤ 1.5 W         |
| Power consumption      | 1.8 W           |

## Input data

### Measurement: Frequency

|                           |   |
|---------------------------|---|
| Description of the input  | intrinsically safe  |
| Available input sources   | in accordance with IEC/EN 60947-5-6 NAMUR                               |
| Pulse time                | 25 μs   |
| Frequency measuring range | 0.001 Hz ... 20000 Hz   |
| Line fault detection      | < 0.05 mA ... 0.35 mA (Line break)<br>< 100 Ω ... 360 Ω (Short circuit) |

## Output data

### Signal: Error message output

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

### Signal: Current

|                                   |  |
|-----------------------------------|--|
| Current output signal             | 0 mA ... 20 mA (configurable)<br>4 mA ... 20 mA (configurable)<br>0 mA ... 20.5 mA (Function area) |
| Output current with short-circuit | 3.8 mA (Default setting, adjustable)   |
| Output current with wire break    | 20.5 mA (Default setting, adjustable)  |
| Load                              | 0 Ω ... 600 Ω  |
| Line fault detection              | < 0.05 mA ... 0.35 mA (Line break)<br>< 100 Ω ... 360 Ω (Short circuit)                            |

## Connection data

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

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## Ex data

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

## Safety data

|  |  |
|--|--|
| Max. internal inductance $L_i$   | negligible   |
| Max. internal capacitance $C_i$  | negligible   |
| Max. output voltage $U_o$  | 10.5 V   |
| Max. output current $I_o$  | 23.4 mA  |
| Max. output power $P_o$  | 61.4 mW  |
| Safety-related maximum voltage $U_m$   | 253 V AC   |
| I/A (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$      | 450 mH / 75 $\mu$ F  |
| IIB/IIIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 230 mH / 16.8 $\mu$ F  |
| IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$      | 63 mH / 2.41 $\mu$ F   |
| I (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$        | 600 mH / 95 $\mu$ F  |
| I/A (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$       | 100 mH / 2.9 $\mu$ F, 10 mH / 4.5 $\mu$ F, 1 mH / 7.3 $\mu$ F, 0.1 mH / 14 $\mu$ F   |
| IIB/IIIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$  | 100 mH / 1.9 $\mu$ F, 20 mH / 2.7 $\mu$ F, 2 mH / 4.5 $\mu$ F, 0.5 mH / 6.4 $\mu$ F  |
| IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$       | 20 mH / 0.49 $\mu$ F, 5 mH / 0.67 $\mu$ F, 1 mH / 0.96 $\mu$ F, 0.2 mH / 1.4 $\mu$ F |
| I (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$         | 100 mH / 4 $\mu$ F, 10 mH / 5.7 $\mu$ F, 2 mH / 7.8 $\mu$ F, 0.1 mH / 17 $\mu$ F     |

## Signaling

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

## Dimensions

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Width               | 17.5 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) |

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## Material specifications

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

## Environmental and real-life conditions

### Ambient conditions

|   |  |
|---|--|
| Degree of protection                    | IP20 (Terminal blocks)<br>IP30 (Housing)   |
| Ambient temperature (operation)         | -40 °C ... 70 °C (Stand-alone device: any mounting position)<br>-40 °C ... 50 °C (Group assembly: vertical DIN rail without circulating air)<br>-40 °C ... 65 °C (Group assembly: vertical DIN rail with circulating air)<br>-40 °C ... 65 °C (Group assembly: horizontal DIN rail without circulating air)<br>-40 °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<br>⊕ II (1) D [Ex ia Da] IIIC<br>⊕ II 3 (1) G Ex nA [ia Ga] IIC T4 Gc<br>⊕ I (M1) [Ex ia Ma] I |
|----------------|--|

### IECEX

|                |   |
|----------------|---|
| Identification | [Ex ia Ga] IIC<br>[Ex ia Da] IIIC<br>Ex nA nC [ia Ga] IIC T4 Gc<br>[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 | 5-way isolation |
|----------------------|-----------------|

## Mounting

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

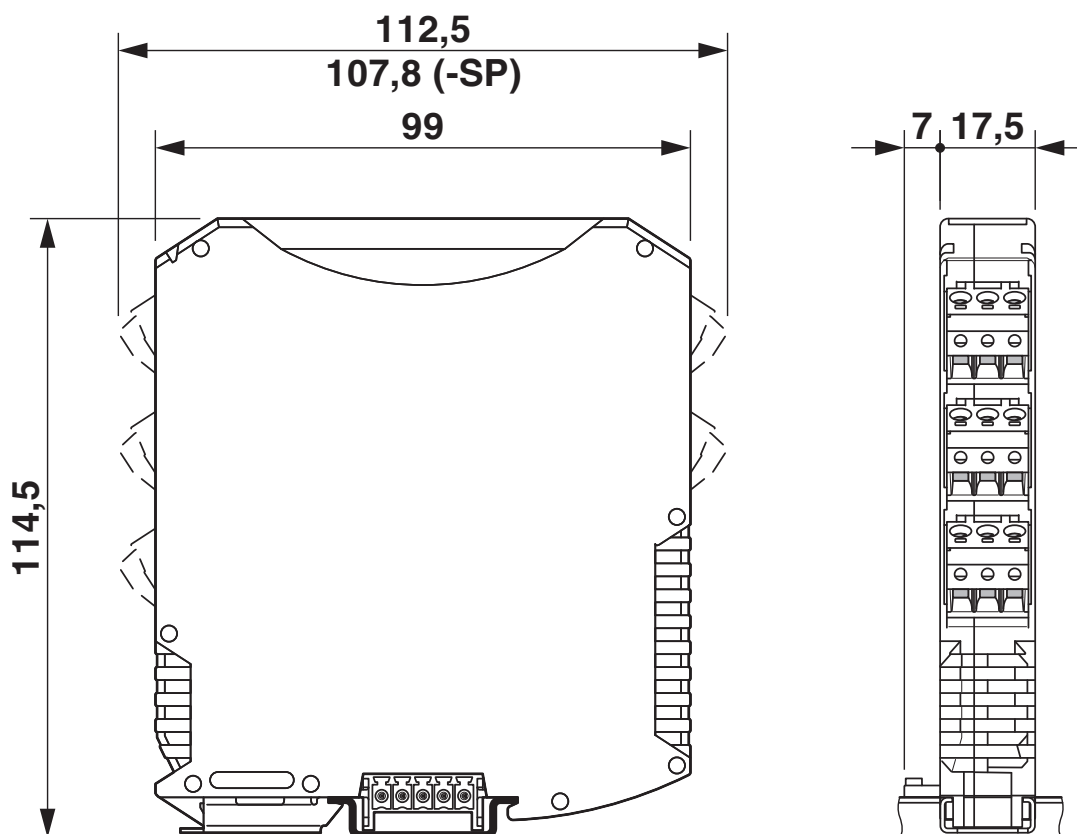
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## Drawings

Dimensional drawing



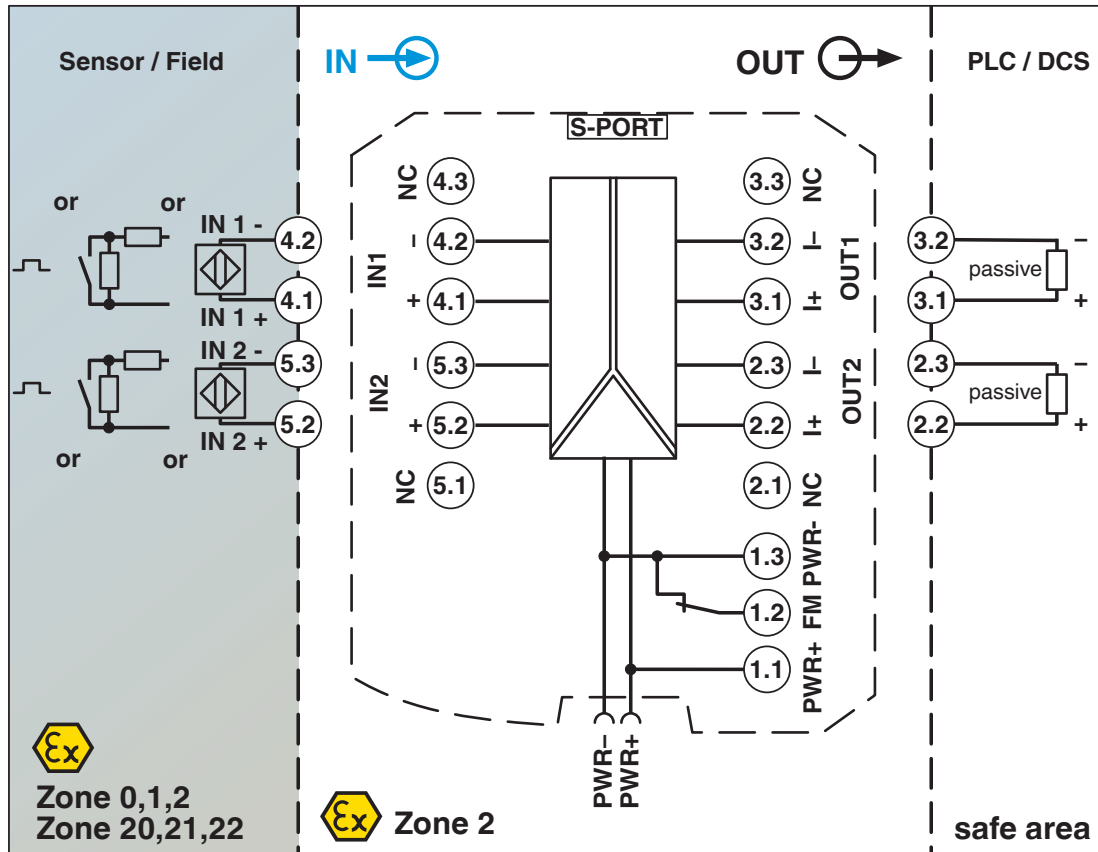
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Block diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1290530>



**IECEx**

Approval ID: IECEx BVS 21.0018X



**ATEX**

Approval ID: BVS 21 ATEX E 016X

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27210128 |
| ECLASS-15.0 | 27210128 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC002918 |
|-----------|----------|

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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)                 |
| SCIP                                | 24247c88-130a-4008-8342-335d1c1327d7 |

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