

# 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
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### 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)
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#### 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)
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## Electrical isolation Output/supply/error message output

Test voltage	350 V (50 Hz, 60 s)
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## 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) < 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) 4 mA ... 20 mA (configurable) 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) < 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) IP30 (Housing)
Ambient temperature (operation)	-40 °C ... 70 °C (Stand-alone device: any mounting position) -40 °C ... 50 °C (Group assembly: vertical DIN rail without circulating air) -40 °C ... 65 °C (Group assembly: vertical DIN rail with circulating air) -40 °C ... 65 °C (Group assembly: horizontal DIN rail without circulating air) -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 ⊕ II (1) D [Ex ia Da] IIIC ⊕ II 3 (1) G Ex nA [ia Ga] IIC T4 Gc ⊕ I (M1) [Ex ia Ma] I
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### IECEX

Identification	[Ex ia Ga] IIC [Ex ia Da] IIIC Ex nA nC [ia Ga] IIC T4 Gc [Ex ia Ma] I
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## EMC data

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

Electrical isolation	5-way isolation
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## Mounting

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

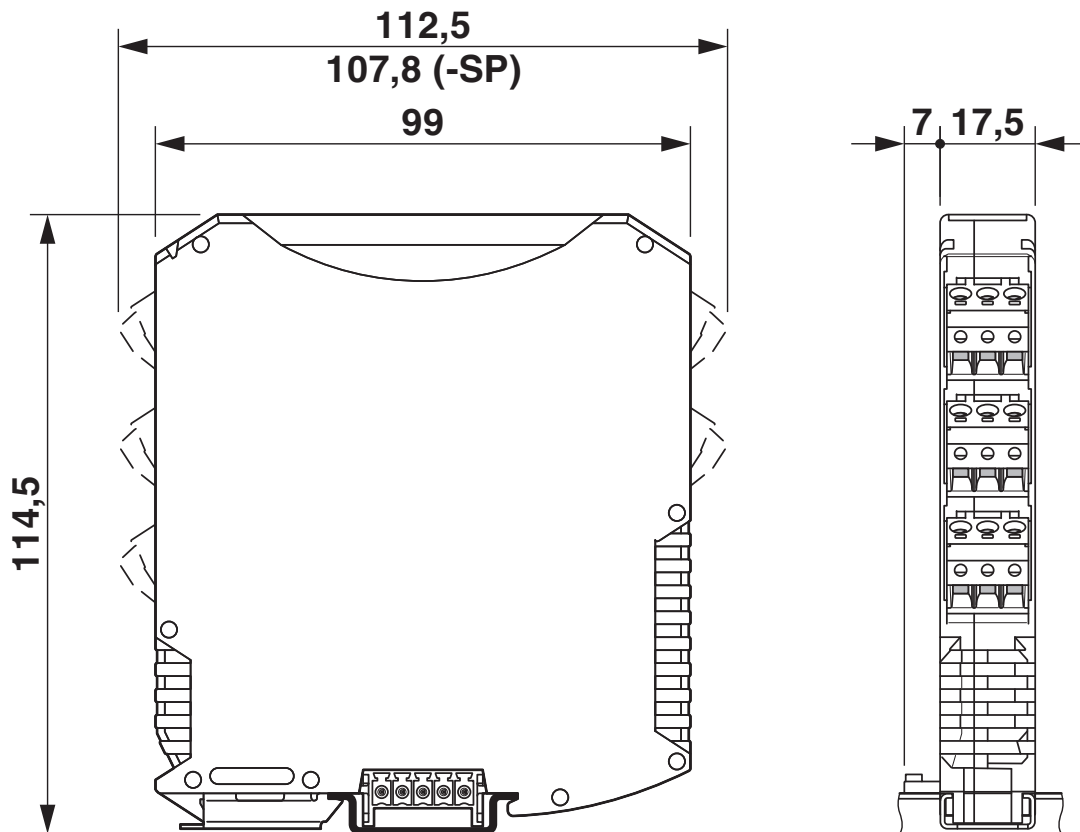
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## Drawings

Dimensional drawing

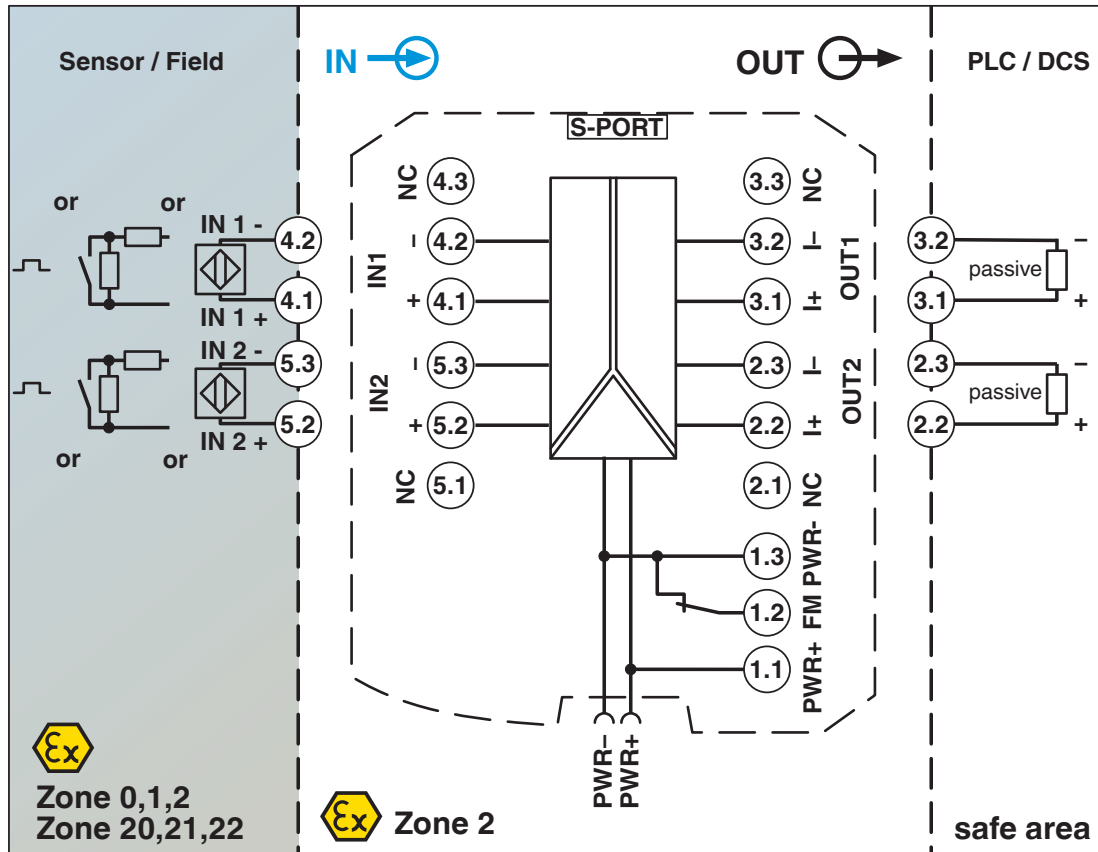


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Block diagram



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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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