

# MACX MCR-EX-SL-RTD-I-SP-NC - Temperature measuring transducer



2924168

<https://www.phoenixcontact.com/us/products/2924168>

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Ex i temperature transducer: converts signals from resistance temperature detectors installed in the Ex area and transmits a 0/4 - 20 mA signal to a load in the safe area. Freely programmable, spring-cage terminal blocks. Replacement item: 1050252 MACX MCR-EX-RTD-I-SP.

## Your advantages

- Power supply possible via DIN rail connector
- Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- Input for resistance thermometers and resistance-type sensors, [Ex ia] IIC
- Installation in zone 2, protection type "n" (EN 60079-15) permitted
- 3-way electrical isolation
- Output: 0 mA ... 20 mA or 4 mA ... 20 mA
- Status indicator for supply voltage, cable, sensor, and module errors
- Configuration via software (FDT/DTM): sensor type, connection technology, measuring range, measuring unit, filter, alarm signal, and output range

## Commercial data

Item number	2924168
Packing unit	1 pc
Note	Made to order (non-returnable)
Sales key	C430
Product key	DK1215
GTIN	4046356438957
Weight per piece (including packing)	179.2 g
Weight per piece (excluding packing)	132.1 g
Customs tariff number	85437090
Country of origin	DE

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## Technical data

### Product properties

Product type	Temperature transmitter
Application	Temperature
No. of channels	1

### Insulation characteristics

Overvoltage category	II
Pollution degree	2

### Electrical properties

Alignment span	± 5 %
Alignment zero	± 5 %
Electrical isolation	3-way isolation
Step response (0–99%)	≤ 1100 ms (when oversampling = 10 and moving average value = 1)
Temperature coefficient, typical	0.01 %/K

### Electrical isolation Input/output/power supply

Rated insulation voltage	300 V <sub>rms</sub>
Test voltage	2.5 kV AC (50 Hz, 60 s)
Insulation	Safe isolation in accordance with IEC/EN 61010-1

### Electrical isolation Input/output

Electrical isolation	375 V (Peak value in accordance with IEC/EN 60079-11)
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### Electrical isolation Input/power supply

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

Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC, -20 % ... +25 %)
Power dissipation	< 1 W

## Input data

### Signal

Number of inputs	1
Input signal	Temperature Resistor

### Measurement

Description of the input	intrinsically safe
Sensor types (RTD) that can be used	Pt, Ni, Cu sensors: 2, 3, 4-wire
Temperature measuring range	-200 °C ... 850 °C (Range depending on the sensor type)

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Linear resistance measuring range	0 $\Omega$ ... 2000 $\Omega$
Max. permissible overall conductor resistance	50 $\Omega$ (Per cable)
Sensor input current	200 $\mu$ A ... 1 mA
Temperature measuring range	min. 50 K

## Output data

Switching:

Configurable/programmable	no
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Signal

Output description	Current output
Number of outputs	1
Configurable/programmable	Yes
Current output signal	0 mA ... 20 mA 4 mA ... 20 mA
Load/output load current output	$\leq$ 500 $\Omega$
Output ripple (current)	$<$ 50 $\mu$ A <sub>PP</sub> $<$ 10 $\mu$ A <sub>rms</sub>
Behavior in the event of a sensor error	As per NE 43 or can be freely defined

## 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 $U_o$	6 V
Max. output current $I_o$	6.3 mA
Max. output power $P_o$	9.4 mW
Safety-related maximum voltage $U_m$	253 V AC
	125 V DC
IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 1.4 $\mu$ F, 10 mH / 1.9 $\mu$ F, 1 mH / 2.7 $\mu$ F
IIB (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 6.9 $\mu$ F, 10 mH / 9.4 $\mu$ F, 1 mH / 15 $\mu$ F
IIA (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	100 mH / 10 $\mu$ F, 10 mH / 13 $\mu$ F, 1 mH / 21 $\mu$ F

## Signaling

LED signaling voltage, PWR (green)

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Status display	Red LED, flashing 2.8 Hz (cable error, sensor error on input or output, ERR)
	Red LED, flashing 1.2 Hz (simulation mode, ERR)
	Red LED, permanently on (module error, ERR)

## Dimensions

Dimensional drawing	
Width	12.5 mm
Height	116 mm
Depth	114.5 mm

## Material specifications

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

## 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)	5 % ... 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 ic [ia Ga] IIC T4 Gc X
Certificate	IBExU 09 ATEX 1013

### IECEX

	[Ex ia Ga] IIC
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Identification	[Ex ia Da] IIIC
	Ex nA ic [ia Ga] IIC T4 Gc
Certificate	IECEX IBE 09.0001X

## UL, USA/Canada

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

## KC-s

Identification	[Ex ia] IIC/IIB
Certificate	17-KA4BO-0414X

## Shipbuilding approval

Identification	C, EMC1
Certificate	GL 86 644-10HH

## EAC Ex

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

## INMETRO

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA [ia Ga] IIC T4 Gc
Certificate	DNV 18.0142 X

## EMC data

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
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## Electromagnetic HF field

Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3

## Fast transients (burst)

Designation	Fast transients (burst)
Standards/regulations	EN 61000-4-4

## Conducted interference

Designation	Conducted interferences
Standards/regulations	EN 61000-4-6

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## Standards and regulations

Electrical isolation	3-way isolation
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## Mounting

Mounting type	DIN rail mounting
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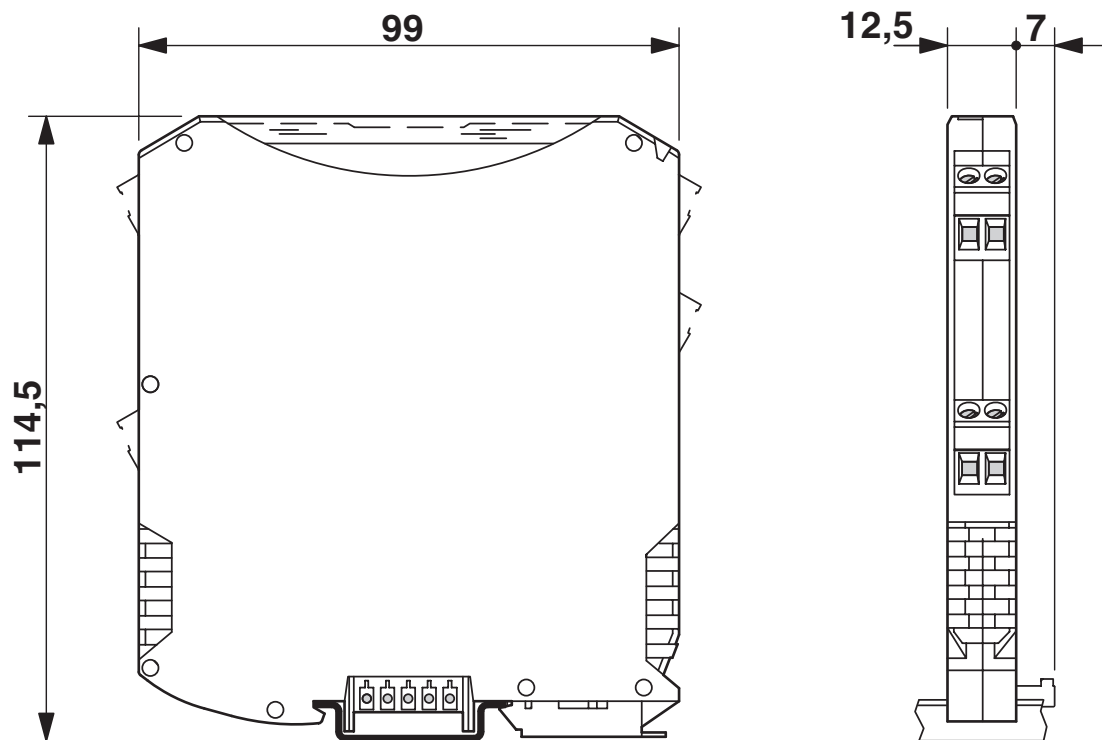
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## Drawings

Dimensional drawing



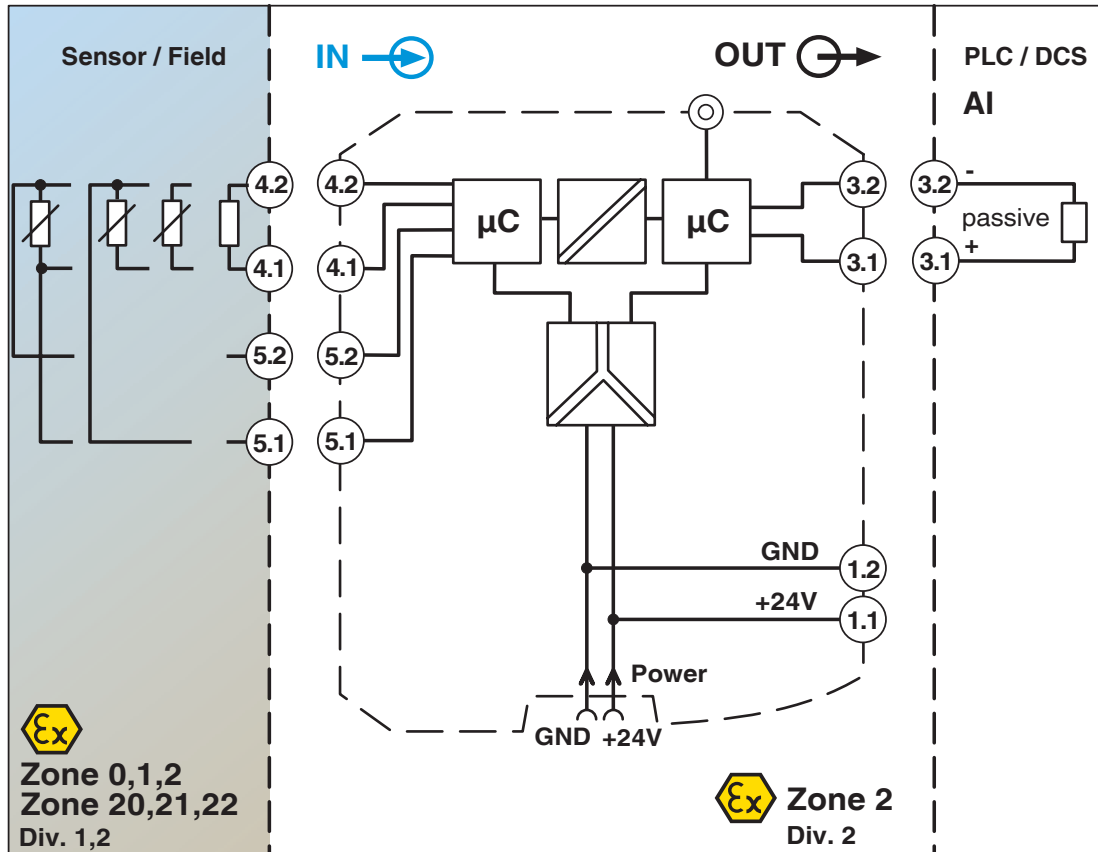
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Block diagram



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## Classifications

### ETIM

ETIM 9.0	EC002919
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### UNSPSC

UNSPSC 21.0	41112105
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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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Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)