Temperature measuring transducer - MACX MCR-EX-SL-RTD-I-SP-NC - 2924168

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The illustration shows the versions with screw connection

Ex-i temperature measuring transducer: Converts signals from resistance thermometers installed in Ex areas and transmits a 0/4-20 mA signal to a load in the safe area. Freely programmable, 3-way isolation, spring-cage terminal blocks.

Why buy this product

- 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
- 0 ... 20 mA or 4 ... 20 mA output
- 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

Key Commercial Data

Packing unit	1 pc
GTIN	4 046356 438957
Weight per Piece (excluding packing)	132.1 g
Custom tariff number	85437090
Country of origin	Germany

Technical data

Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area

Dimensions

Width	12.5 mm

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Dimensions

Height	99 mm
Depth	114.5 mm

Ambient conditions

Ambient temperature (operation)	-20 °C ... 60 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Noise immunity	EN 61000-6-2 When being exposed to interference, there may be minimal deviations.
Degree of protection	IP20

Input data

Sensor types (RTD) that can be used	Sensors (2-, 3-, 4-wire)
Temperature measuring range	-200 °C ... 850 °C (Range depending on the sensor type)
Input signal range	0 Ω ... 2000 Ω
Cable resistance	≤ 50 Ω per cable
Sensor input current	200 µA ... 1 mA
Measuring range span	min. 50 K

Output data

Signal output	Current output
Current output signal	0 mA ... 20 mA
	4 mA ... 20 mA
Load/output load current output	≤ 500 Ω
Output ripple (current)	< 50 μA_{PP}
Behavior in the event of a sensor error	As per NE 43 or can be freely defined

Power supply

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

Connection data

Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	1.5 mm²
Conductor cross section flexible min.	0.2 mm²
Conductor cross section flexible max.	1.5 mm²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	16
Stripping length	8 mm
Connection method	Push-in connection

General

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Technical data

General

No. of channels	1
Temperature coefficient, typical	0.01 %/K
Step response (0–99%)	typ. 700 ms
	≤ 1100 ms
Alignment zero	± 5 %
Alignment span	± 5 %
Status display	Green LED (supply voltage, PWR)
	Red LED, flashing (line, sensor error, ERR)
	Red LED (module error, ERR)
Inflammability class according to UL 94	V0
Pollution degree	2
Surge voltage category	II
Emitted interference	EN 61000-6-4
Housing material	PA 66-FR
Color	green
Designation	Input/output/power supply
Electrical isolation	300 V_{rms} (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1))
	2.5 kV (50 Hz, 1 min., test voltage)
Designation	Input/output
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Designation	Input/power supply
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Conformance	CE-compliant, additionally EN 61326
ATEX	# 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
IECEx	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA ic [ia Ga] IIC T4 Gc
UL, USA / Canada	Class I Div 2; IS for Class I, II, III Div 1

Safety characteristic data

Integrity requirement	IEC 61508 - Low demand
Architecture	Single-channel, 1oo1
Equipment type	Type B
Safe Failure Fraction (SFF)	91.3 %
MTBF	119 Years
λ_{SU}	1.5 x 10^{-7} (150 FIT)
λ_{SD}	4.61 x 10^{-7} (461 FIT)

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Safety characteristic data

λ_{DU}	3.23 x 10^{-7} (323 FIT)
λ_{DD}	3.18 x 10^{-8} (31.8 FIT)
Probability of a hazardous failure on demand (PFD_{AVG})	1.3 x 10^{-4} (1 year)
	2.6 x 10^{-4} (2 years)
	3.91 x 10^{-4} (3 years)
	6.51 x 10^{-4} (5 years)
	9.11 x 10^{-4} (7 years)
	1.04 x 10^{-3} (8 years)
Diagnostic coverage (DC)	90.2 %
Integrity requirement	IEC 61508 - High demand
Architecture	Single-channel, 1oo1
Equipment type	Type B
Safe Failure Fraction (SFF)	91.3 %
MTBF	119 Years
λ_{SU}	1.5 x 10^{-7} (150 FIT)
λ_{SD}	4.61 x 10^{-7} (461 FIT)
λ_{DU}	3.23 x 10^{-7} (323 FIT)
λ_{DD}	3.18 x 10^{-8} (31.8 FIT)
Probability of a hazardous failure per hour (PFH_D)	3,23 x 10^{-8}
Diagnostic coverage (DC)	90.2 %

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
Group	IIC
Max. external inductivity L_o	100 mH
Max. external capacity C_o	1.4 µF
Group	IIC
Max. external inductivity L_o	10 mH
Max. external capacity C_o	1.9 µF
Group	IIC
Max. external inductivity L_o	1 mH
Max. external capacity C_o	2.7 µF
Group	IIB
Max. external inductivity L_o	100 mH
Max. external capacity C_o	6.9 µF
Group	IIB

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Technical data

Safety data

Max. external inductivity L_o	10 mH
Max. external capacity C_o	9.4 µF
Group	IIB
Max. external inductivity L_o	1 mH
Max. external capacity C_o	15 µF
Safety-related maximum voltage U_m	253 V AC (125 V DC)

EMC data

Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
Typical deviation from the measuring range final value	4 %
Designation	Fast transients (burst)
Standards/regulations	EN 61000-4-4
Typical deviation from the measuring range final value	4 %
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Typical deviation from the measuring range final value	4 %

Classifications

eCl@ss

eCl@ss 4.0	27200206
eCl@ss 4.1	27200206
eCl@ss 5.0	27200206
eCl@ss 5.1	27200206
eCl@ss 6.0	27200206
eCl@ss 7.0	27200206
eCl@ss 8.0	27371503

ETIM

ETIM 2.0	EC001446
ETIM 3.0	EC001446
ETIM 4.0	EC001446
ETIM 5.0	EC002568

UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008

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Classifications

UNSPSC

UNSPSC 13.2	39121008

Approvals

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UL Listed / cUL Listed / Functional Safety / EAC / cULus Listed

Ex Approvals

ATEX / UL Listed / cUL Listed / IECEx / EAC Ex / cULus Listed

Approvals submitted

Approval details

UL Listed

cUL Listed

Functional Safety

EAC

cULus Listed

Accessories

Accessories

Programming adapter

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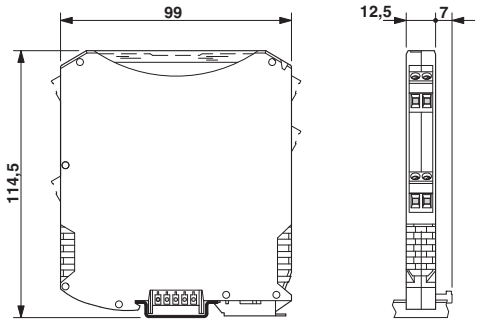
Accessories

Programming adapter - IFS-USB-PROG-ADAPTER - 2811271

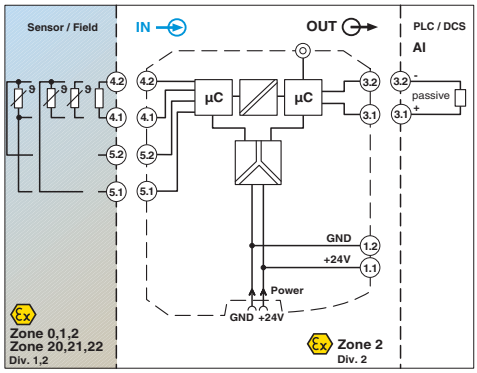
Programming adapter with USB interface, for programming with software. The USB driver is included in the software solutions for the products to be programmed, such as measuring transducers or motor managers.

Drawings

Dimensional drawing



Block diagram



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