

Temperature measuring transducer - MACX MCR-EX-T-UIREL-UP - 2865751

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Programmable temperature transducer with analog output and 3 limit value relays, intrinsically safe signal input, resistance thermometer in 2-, 3-, or 4-wire technology, thermocouples, galvanic isolation, wide-range power supply, screw connection, SIL

Product Features

- ✓ Input for resistance thermometers, thermocouples, resistance-type sensors, potentiometers, and mV sources, [Ex ia] IIC
- ✓ Programming during operation with Ex measuring circuit connected and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- ✓ Cold junction compensation with separate plug
- ✓ Configuration via software (FDT/DTM) or IFS-OP-UNIT operator interface and display unit
- ✓ Up to SIL 2 according to EN 61508
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ Status indicator for supply voltage, cable, sensor, and module errors
- ✓ Freely programmable input and output
- ✓ Inverse output signal ranges as an option
- ✓ Three limit value relays, can be used in combination as a safe limit value relay
- ✓ Plug-in screw or spring-cage connection technology (Push-in technology)
- ✓ Wide-range power supply of 19.2 ... 253 V AC/DC
- ✓ Measure differential temperatures



Key commercial data

Packing unit	1 pc
Weight per Piece (excluding packing)	280.0 GRM
Custom tariff number	85437090
Country of origin	Germany

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Technical data

Note

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

Width	35 mm
Height	99 mm
Depth	114.5 mm

Ambient conditions

Ambient temperature (operation)	-20 °C ... 65 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	typ. 5 % ... 95 % (non-condensing)
Noise immunity	EN 61000-6-2 When being exposed to interference, there may be minimal deviations.
Shock	15g, according to IEC 60068-2-27
Vibration (operation)	5g, accordance to IEC 60068-2-6
Degree of protection	IP20

Input data

Sensor types (RTD) that can be used	Pt, Ni, Cu sensors: 2, 3, 4-wire
Sensor types that can be used (TC)	B, E, J, K, N, R, S, T, L, U, CA, DA, A1G, A2G, A3G, MG, LG
Temperature measuring range	-250 °C ... 2500 °C (Range depending on the sensor type)
Input signal range	0 Ω ... 50 kΩ
Potentiometer resistance range	0 Ω ... 50 kΩ
Input signal range	-1000 mV ... 1000 mV

Output data

Max. voltage output signal	± 11 V
Current output signal	0 mA ... 20 mA ±10 V (in the case of SIL; further free configuration without SIL)
Max. current output signal	22 mA
Load/output load voltage output	≥ 10 kΩ
Load/output load current output	≤ 600 Ω (20 mA)
Behavior in the event of a sensor error	According to NE 43 or freely configurable
Output name	Relay output
Contact type	3 PDTs
Contact material	AgSnO ₂ , hard gold-plated

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Output data

Maximum switching voltage	250 V AC (250 V DC)
Maximum inrush current	2 A (250 V AC)
	2 A (28 V DC)
Mechanical service life	1 x 10 ⁵ cycles

Power supply

Supply voltage range	24 V ... 230 V AC/DC (-20%/+10%, 50/60 Hz)
Typical current consumption	< 100 mA (24 V DC)
Power consumption	< 2.4 W

Connection data

Conductor cross section solid min.	0.2 mm ²
Conductor cross section solid max.	2.5 mm ²
Conductor cross section stranded min.	0.2 mm ²
Conductor cross section stranded max.	2.5 mm ²
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	14
Stripping length	7 mm
Screw thread	M3
Connection method	Screw connection
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

General

Maximum transmission error	0.1 % (e.g. for Pt 100, 300 K span, 4 ... 20 mA)
Maximum temperature coefficient	0.01 %/K
Step response (0–99%)	typ. 1000 ms (With SIL)
	typ. 700 ms (Without SIL)
Status display	Green LED (supply voltage, PWR)
	Red LED, flashing (line, sensor error, ERR)
	Red LED (module error, ERR)
	Yellow LED (switching output)
Inflammability class according to UL 94	V0
Pollution degree	2
Surge voltage category	II
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Housing material	PA 66-FR

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Technical data

General

Color	green
Designation	Input/output/power supply
Electrical isolation	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)
Designation	Input/switching output
Electrical isolation	375 V (Peak value in accordance with EN 60079-11)
Designation	Output/supply
Electrical isolation	300 V _{rms} (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1))
Conformance	CE-compliant
ATEX	# II (1) G [Ex ia Ga] IIC
	# II (1) D [Ex ia Da] IIIC
	# II 3 G Ex nA nC ic IIC T4 Gc X
IECEx	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex nA nC ic IIC T4 Gc X
UL, USA / Canada	UL 508 Listed
Functional Safety (SIL)	SIL 2

Safety data

Max. internal inductance L_i	negligible
Max. internal capacitance C_i	44 nF
Max. output voltage U_o	6 V
Max. output current I_o	7.4 mA
Max. output power P_o	11 mW
Group	IIC
Max. external inductivity L_o	100 mH
Max. external capacity C_o	1.3 μ F
Group	IIC
Max. external inductivity L_o	10 mH
Max. external capacity C_o	1.7 μ F
Group	IIC
Max. external inductivity L_o	1 mH

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Technical data

Safety data

Max. external capacity C_o	2.6 μ F
Group	IIB
Max. external inductivity L_o	110 mH
Max. external capacity C_o	6.8 μ F
Group	IIB
Max. external inductivity L_o	10 mH
Max. external capacity C_o	9.2 μ F
Group	IIB
Max. external inductivity L_o	1 mH
Max. external capacity C_o	15 μ F
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	2 %
Designation	Fast transients (burst)
Standards/regulations	EN 61000-4-4
Typical deviation from the measuring range final value	2 %
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Typical deviation from the measuring range final value	2 %

Classifications

eCl@ss

eCl@ss 4.0	27210107
eCl@ss 4.1	27210107
eCl@ss 5.0	27210107
eCl@ss 5.1	27210107
eCl@ss 6.0	27210107
eCl@ss 7.0	27210107
eCl@ss 8.0	27210107

ETIM

ETIM 4.0	EC001596
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Classifications

ETIM

ETIM 5.0	EC002653
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UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008

Approvals

Approvals

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Functional Safety / UL Listed / cUL Listed / cULus Listed

Ex Approvals

IECEx / ATEX / UL Listed / cUL Listed / cULus Listed

Approvals submitted

Approval details

Functional Safety

UL Listed 

cUL Listed 
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Approvals

cULus Listed 

Accessories

Accessories

Plug

Plug - MACX MCR-EX-I20 - 2905679



Connection terminal block for current signals +20 mA ...-20 mA for safe switching of limit values, in combination with MACX...EX-T-UI... temperature transducers.

Plug - MACX MCR-EX-CJC - 2925002



Plug for cold junction compensation for thermocouples, for safe switching of limit values, in combination with MACX ...EX-T-UI... temperature transducers.

Programming adapter

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

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Block diagram

