Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Please be informed that the data shown in this PDF Document is generated from our Online Catalog. Please find the complete data in the user's documentation. Our General Terms of Use for Downloads are valid (http://phoenixcontact.com/download)

Ex i temperature transducer: converts signals from thermocouples installed in Ex areas and mV sources and transmits a 0/4…20 mA signal to a load in the safe area. Freely programmable. 3-way isolation, screw connection, SIL.

Your advantages

- Input for thermocouples and mV sources
- 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
- Installation in zone 2, protection type "ec" (EN 60079-7) permitted
- 3-way electrical isolation
- 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
- 0 ... 20 mA or 4 ... 20 mA output

Key Commercial Data

Packing unit	1 pc
GTIN	4 055626 663463
GTIN	4055626663463
Weight per Piece (excluding packing)	150.000 g
Custom tariff number	85437090
Country of origin	Germany
Note	Made to Order (non-returnable)

Technical data

Note

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

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Technical data

Dimensions

Width	12.5 mm
Height	112.5 mm
Depth	114.5 mm

Ambient conditions

Ambient temperature (operation)	-40 °C ... 70 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Degree of protection	IP20
Noise immunity	EN 61000-6-2 When being exposed to interference, there may be minimal deviations.

Input data

Input	Intrinsically safe
Sensor types that can be used (TC)	B, E, J, K, N, R, S, T, L, U, C, D, A-1, A-2, A-3, M, Lr
Temperature measuring range	-250 °C ... 2500 °C (Range depending on the sensor type)
Input signal range	-1000 mV ... 1000 mV
Measuring range span	Min. 50 K with thermocouple, 10% of the nominal span of the respective range with mV sources

Output data

Signal output	Current output
Configurable/programmable	Yes
Current output signal	0 mA ... 20 mA
	4 mA ... 20 mA (SIL)
Load/output load current output	≤ 600 Ω
Output ripple (current)	< 15 μA_{PP}
Behavior in the event of a sensor error	As per NE 43 or can be freely defined

Power supply

Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC -20%...+25%)
Max. current consumption	< 40 mA (24 V DC)
Power dissipation	≤ 0.76 W
Power consumption	≤ 1 W

Connection data

Connection method	Screw connection
Stripping length	7 mm
Screw thread	M3
Conductor cross section solid	0.2 mm² ... 2.5 mm²
Conductor cross section flexible	0.2 mm² ... 2.5 mm²
Conductor cross section AWG	24 ... 14

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Technical data

Connection data

Torque	0.5 Nm ... 0.6 Nm

General

No. of channels	1
Transmission error, typical	0.1 % (E.g., for type J, 600 K span, 4 mA ... 20 mA)
Temperature coefficient, typical	0.01 %/K
Typical cold point errors	± 2 K
Step response (0–99%)	typ. 700 ms
	≤ 1000 ms
Alignment zero	± 5 %
Alignment span	± 5 %
Status display	Green LED (supply voltage, PWR)
	Red LED, flashing 2.4 Hz (cable error, sensor error on input or output, ERR)
	Red LED, flashing 1.2 Hz (service operation, ERR)
	Red LED, permanently on (module error, ERR)
Flammability rating according to UL 94	V0
Electromagnetic compatibility	Conformance with EMC directive
Interference emission	EN 61000-6-4
Housing material	PA 6.6-FR
Color	gray
Designation	Input/output/power supply
Electrical isolation	300 V_{rms} (Rated insulation voltage (overvoltage category II; degree of pollution 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	# I (M1) [Ex ia Ma] I
	# II (1) G [Ex ia Ga] IIC
	# II (1) D [Ex ia Da] IIIC
	# II 3(1) G Ex ec ic [ia Ga] IIC T4 Gc
IECEx	[Ex ia Ma] I
	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec ic [ia Ga] IIC T4 Gc
	Ex ec ic IIC T4 Gc
SIL	2

Safety data

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Technical data

Safety data

Max. internal capacitance C_i	44 nF
Max. output voltage U_o	6 V
Max. output current I_o	4.3 mA (mV)
Max. output power P_o	25.2 mW (Linear)
Group	IIC/IIB/IIA
Max. external inductivity L_o	100 mH
Max. external capacity C_o	40 µF
Safety-related maximum voltage U_m	253 V AC (125 V DC, Zone 2: 3.1, 3.2 = 30 V DC)
Input voltage U_i	7 V
Input current I_i	100 mA
Input power P_i	550 mW
Max. internal capacitance C_i	47 µF
Max. output voltage U_o	3.5 V
Max. output current I_o	400 mA
Max. output power P_o	350 mW
Group	IIC
Max. external inductivity L_o	20 µH
Max. external capacity C_o	2 µF

EMC data

Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
Typical deviation from the measuring range final value	1 %
Designation	Fast transients (burst)
Standards/regulations	EN 61000-4-4
Typical deviation from the measuring range final value	1 %
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Typical deviation from the measuring range final value	1 %

Standards and Regulations

Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4
Designation	Electromagnetic RF field
Standards/regulations	EN 61000-4-3
	EN 61000-4-4
Designation	Conducted interferences
Standards/regulations	EN 61000-4-6
Flammability rating according to UL 94	V0
Conformance	CE-compliant, additionally EN 61326
ATEX	# I (M1) [Ex ia Ma] I

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Technical data

Standards and Regulations

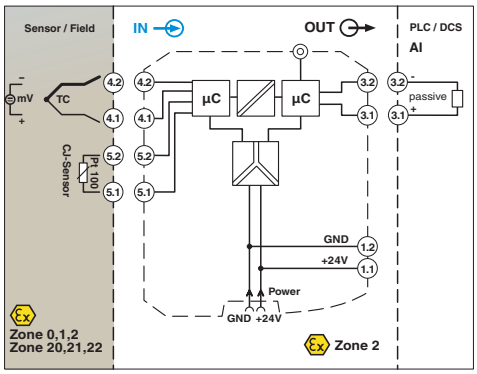
	# II (1) G [Ex ia Ga] IIC
	# II (1) D [Ex ia Da] IIIC
	# II 3(1) G Ex ec ic [ia Ga] IIC T4 Gc
IECEx	[Ex ia Ma] I
	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec ic [ia Ga] IIC T4 Gc
	Ex ec ic IIC T4 Gc
DNV GL-Temperature	B
DNV GL-Humidity	B
DNV GL-Vibration	A
DNV GL-EMC	B
DNV GL-Enclosure	Required protection according to the Rules shall be provided upon installation on board
Group	IIC/IIB/IIA
	IIC

Environmental Product Compliance

China RoHS	Environmentally Friendly Use Period = 50
	For details about hazardous substances go to tab “Downloads”, Category “Manufacturer's declaration”

Drawings

Block diagram



Classifications

eCl@ss

eCl@ss 8.0	27200206
eCl@ss 9.0	27210129

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Classifications

ETIM

ETIM 5.0	EC001446
ETIM 6.0	EC002919
ETIM 7.0	EC002919

Approvals

Approvals

Approvals

DNV GL

Ex Approvals

Approval details

DNV GL		https://approvalfinder.dnvgl.com/	TAA00000AG

Accessories

Accessories

Device marking

Plastic label - UC-EMLP (11X9) - 0819291

Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm

Plastic label - UC-EMLP (11X9) YE - 0822602

Plastic label, Sheet, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Accessories

Plastic label - UC-EMLP (11X9) SR - 0828094

Plastic label, Sheet, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm

---

Plastic label - US-EMLP (11X9) - 0828789

Plastic label, Card, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm

---

Plastic label - US-EMLP (11X9) YE - 0828871

Plastic label, Card, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm

---

Plastic label - US-EMLP (11X9) SR - 0828872

Plastic label, Card, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm

---

Device marker - LS-EMLP (11X9) WH - 0831678

Device marker, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm

---

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Accessories

Device marker - LS-EMLP (11X9) YE - 0831732

Device marker, Sheet, yellow, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm

Device marker - LS-EMLP (11X9) SR - 0831705

Device marker, Sheet, silver, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm

Insulating sleeve

Insulating sleeve - MPS-IH BK - 0201731

Insulating sleeve, color: black

Insulating sleeve - MPS-IH GY - 0201728

Insulating sleeve, color: gray

Insulating sleeve - MPS-IH GN - 0201702

Insulating sleeve, color: green

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Accessories

Insulating sleeve - MPS-IH YE - 0201692

Insulating sleeve, color: yellow

Insulating sleeve - MPS-IH BU - 0201689

Insulating sleeve, color: blue

Insulating sleeve - MPS-IH RD - 0201676

Insulating sleeve, color: red

Insulating sleeve - MPS-IH WH - 0201663

Insulating sleeve, color: white

Labeled device marker

Plastic label - UC-EMLP (11X9) CUS - 0824547

Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

---

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Accessories

Plastic label - UC-EMLP (11X9) YE CUS - 0824548

Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

Plastic label - UC-EMLP (11X9) SR CUS - 0828098

Plastic label, can be ordered: by sheet, silver, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

Module carrier

Module carrier - TC-D37SUB-ADIO16-EX-P-UNI - 2924854

Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection)

Module carrier - TC-D37SUB-AIO16-EX-PS-UNI - 2902932

Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection), with HART multiplexer connection

Power module

Power and error message module - MACX MCR-PTB - 2865625

Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Accessories

Power and error message module - MACX MCR-PTB-SP - 2924184

Power and fault signaling module with Push-in connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

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.

Adapter - IFS-BT-PROG-ADAPTER - 2905872

Bluetooth adapter with micro USB and S-PORT interface for wireless communication with the MINI Analog, MINI Analog Pro, MACX Analog, INTERFACE system gateways, and PLC logic device series.

Test plug terminal block

Test plugs - MPS-MT - 0201744

Test plugs, with solder connection up to 1 mm² conductor cross section, color: gray

DIN rail bus connectors - ME 6,2 TBUS-2 1,5/5-ST-3,81 GY - 2695439

DIN rail connector (TBUS), 5-pos., for bridging the supply voltage, can be snapped onto NS 35/... DIN rails according to EN 60715

Plug - IOA MCR-CJC-PT100 - 1085776

Temperature measuring transducer - MACX MCR-EX-TC-I - 1050233

Accessories

Plug for cold junction compensation for thermocouples, in combination with MACX MCR(-EX)-TC... temperature transducers