

Temperature measuring transducer - MACX MCR-EX-SL-TC-I-NC - 2865586

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://download.phoenixcontact.com>)



Ex-i temperature measuring transducer: Converts signals from thermocouples installed in Ex areas and mV sources and transmits a 0/4-20 mA signal to a load in a safe area. Freely programmable, 3-way isolation, SIL2

Product Features

- Input for resistance thermometers and resistance-type sensors, [Ex ia] IIC
- 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 "n" (EN 60079-15) permitted
- Up to SIL 2 according to EN 61508
- 3-way electrical isolation
- Status indicator for supply voltage, cable, sensor, and module errors
- 0 ... 20 mA or 4 ... 20 mA output
- Configuration via software (FDT/DTM): sensor type, connection technology, measuring range, measuring unit, filter, alarm signal, and output range



Key commercial data

| | |
|------------------|---------------|
| package_quantity | 1 |
| GTIN | 4046356160513 |

Technical data

Note:

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

Dimensions

| | |
|--------|----------|
| Width | 12.5 mm |
| 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 |

Temperature measuring transducer - MACX MCR-EX-SL-TC-I-NC - 2865586

Technical data

Ambient conditions

| | |
|----------------------------------|--------------------------------|
| Maximum altitude | ≤ 2000 m |
| Permissible humidity (operation) | 5 % ... 95 % (no condensation) |
| Degree of protection | IP20 |

Input data

| | |
|------------------------------------|--|
| Input | Intrinsically safe |
| Sensor types that can be used (TC) | E, J, K, N as per IEC / EN 60584, L as per DIN 43760 |
| Temperature measuring range | -250 °C ... 1372 °C (Range depending on the sensor type) |
| Input signal range | -20 mV ... 70 mV |
| Measuring range span | (Min. 50 K for thermocouples, 3 mV for mV sources) |

Output data

| | |
|---|---------------------------------------|
| Signal output | Current output |
| Current output signal | 0 mA ... 20 mA |
| Current output signal | 4 mA ... 20 mA |
| Load/output load current output | max. 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

| | |
|--------------------------|-----------------------|
| Nominal supply voltage | 24 V DC |
| Supply voltage range | 19.2 V DC ... 30 V DC |
| Max. current consumption | < 40 mA (24 V DC) |
| Power consumption | < 1 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

| | |
|----------------------------------|------------------------|
| No. of channels | 1 |
| Temperature coefficient, typical | 0.01 %/K |
| Typical cold point errors | ± 1 K |
| Step response (0-99%) | typ. 800 ms (With SIL) |

Temperature measuring transducer - MACX MCR-EX-SL-TC-I-NC - 2865586

Technical data

General

| | |
|---|---|
| Step response (0–99%) | max. 1200 ms (With SIL) |
| Step response (0–99%) | typ. 700 ms (Without SIL) |
| Step response (0–99%) | max. 1100 ms (Without SIL) |
| Alignment zero | ± 5 % |
| Alignment span | ± 5 % |
| Status display | Green LED (supply voltage, PWR) |
| Status display | Red LED, flashing (line, sensor error, ERR) |
| Status display | Red LED (module error, ERR) |
| Inflammability class according to UL 94 | V0 |
| Pollution degree | 2 |
| Surge voltage category | II |
| Housing material | PA 66-FR |
| Color | green |
| Name | 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)) |
| Electrical isolation | 2.5 kV (50 Hz, 1 min., test voltage) |
| Name | Input/output |
| Electrical isolation | 375 V (Peak value in accordance with EN 60079-11) |
| Name | 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 |
| ATEX | # II (1) D [Ex ia Da] IIIC |
| ATEX | # II 3(1) G Ex nA ic [ia Ga] IIC T4 Gc X |
| IECEX | [Ex ia Ga] IIC |
| IECEX | [Ex ia Da] IIIC |
| IECEX | Ex nA ic [ia Ga] IIC T4 Gc |
| UL, USA / Canada | Class I Div 2; IS for Class I, II, III Div 1 |
| Functional safety (SIL) | SIL 2 TÜV Rheinland 968/EZ374.00/09 |

Safety characteristic data

| | |
|------------------------------|---------------------------------|
| Integrity requirement | IEC 61508 - Low demand |
| Architecture | Single-channel, 1oo1 |
| Equipment type | Type B |
| Safety Integrity Level (SIL) | 2 |
| Safe Failure Fraction (SFF) | 96.5 % |
| MTBF | 123 Years |
| λ_{SU} | 1.42×10^{-7} (142 FIT) |
| λ_{SD} | 4.38×10^{-7} (438 FIT) |

Temperature measuring transducer - MACX MCR-EX-SL-TC-I-NC - 2865586

Technical data

Safety characteristic data

| | |
|--|----------------------------------|
| λ_{DU} | 3.24×10^{-8} (32.4 FIT) |
| λ_{DD} | 3.14×10^{-7} (314 FIT) |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 1.31×10^{-4} (1 year) |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 2.62×10^{-4} (2 years) |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 3.93×10^{-4} (3 years) |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 6.55×10^{-4} (5 years) |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 9.17×10^{-4} (7 years) |
| Probability of a hazardous failure on demand (PFD _{AVG}) | 1.05×10^{-3} (8 years) |
| Diagnostic coverage (DC) | 90.7 % |
| Integrity requirement | IEC 61508 - High demand |
| Architecture | Single-channel, 1oo1 |
| Equipment type | Type B |
| Safety Integrity Level (SIL) | Up to 2 |
| Safe Failure Fraction (SFF) | 90.7 % |
| MTBF | 123 Years |
| λ_{SU} | 1.42×10^{-7} (150 FIT) |
| λ_{SD} | 4.38×10^{-7} (438 FIT) |
| λ_{DU} | 3.24×10^{-8} (32.4 FIT) |
| λ_{DD} | 3.14×10^{-7} (314 FIT) |
| Probability of a hazardous failure per hour (PFH _D) | $3,24 \times 10^{-8}$ |
| Diagnostic coverage (DC) | 90.7 % |

Safety data

| | |
|---------------------------------|-------------|
| Max. output voltage U_o | 6 V |
| Max. output current I_o | 4.7 mA |
| Max. output power P_o | 7 mW |
| Gas group | IIC |
| Max. external inductivity L_o | 100 mH |
| Max. external capacity C_o | 1.5 μ F |
| Gas group | IIC |
| Max. external inductivity L_o | 10 mH |
| Max. external capacity C_o | 1.9 μ F |
| Gas group | IIC |
| Max. external inductivity L_o | 1 mH |
| Max. external capacity C_o | 2.7 μ F |
| Gas group | IIB |
| Max. external inductivity L_o | 100 mH |
| Max. external capacity C_o | 7 μ F |

Temperature measuring transducer - MACX MCR-EX-SL-TC-I-NC - 2865586

Technical data

Safety data

| | |
|---|---------------------|
| Gas group | IIB |
| Max. external inductivity L_o | 10 mH |
| Max. external capacity C_o | 9.4 µF |
| Gas 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) |

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 | 27200206 |

ETIM

| | |
|-----------------|----------|
| ETIM 2.0 | EC001446 |
| ETIM 3.0 | EC001446 |
| ETIM 4.0 | EC001446 |
| ETIM 5.0 | EC001446 |

UNSPSC

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

approvals

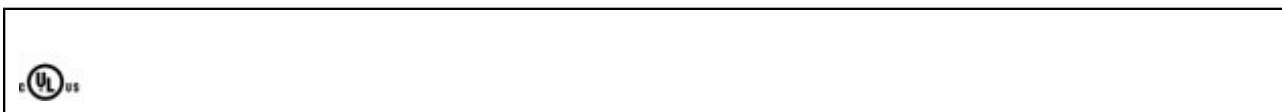
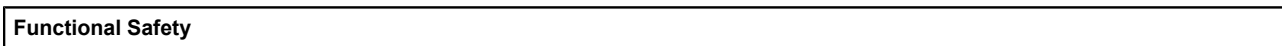
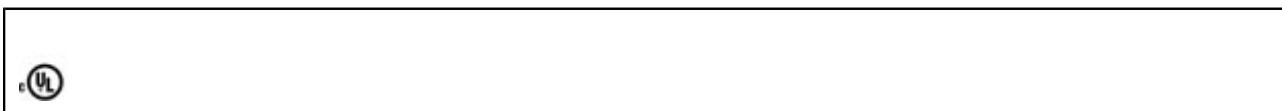
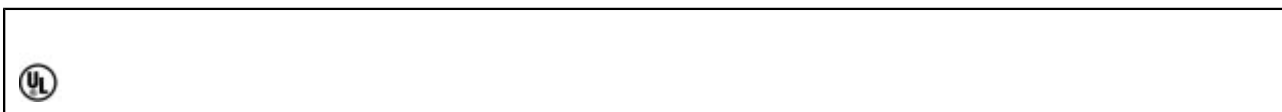
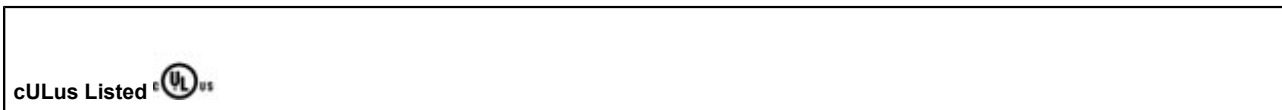
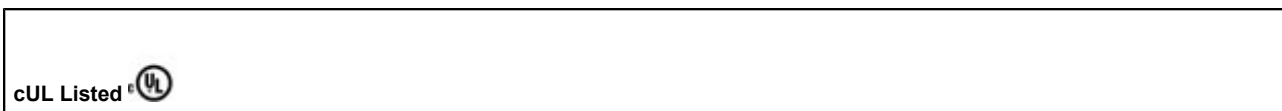
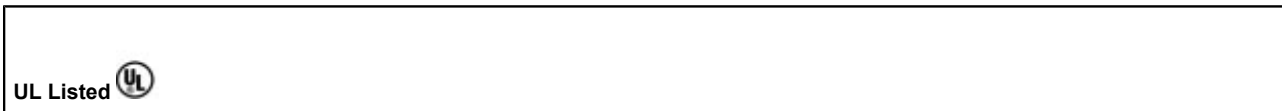
IECEX / ATEX / UL Listed / cUL Listed / cULus Listed / UL Listed / cUL Listed / Functional Safety / cULus Listed /

Approval details

| |
|--------------|
| IECEX |
|--------------|

Temperature measuring transducer - MACX MCR-EX-SL-TC-I-NC - 2865586

approvals



accessories

Programming adapter

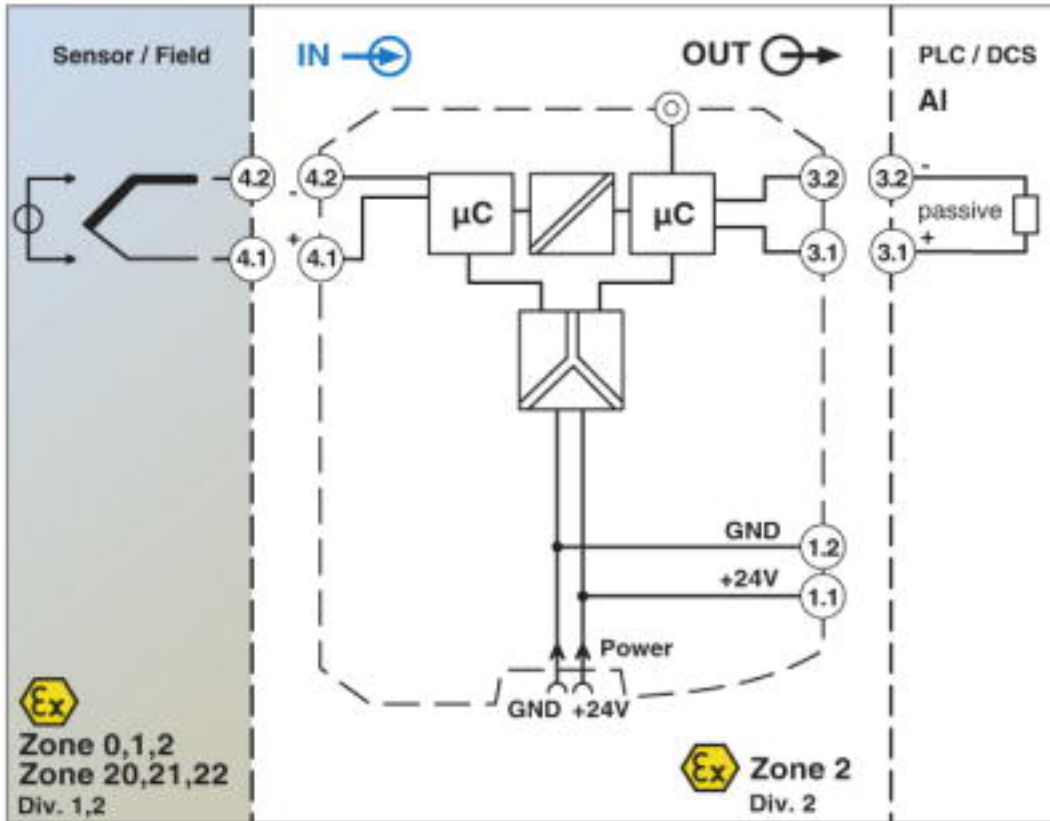
IFS-USB-PROG-ADAPTER - 2811271



Drawings

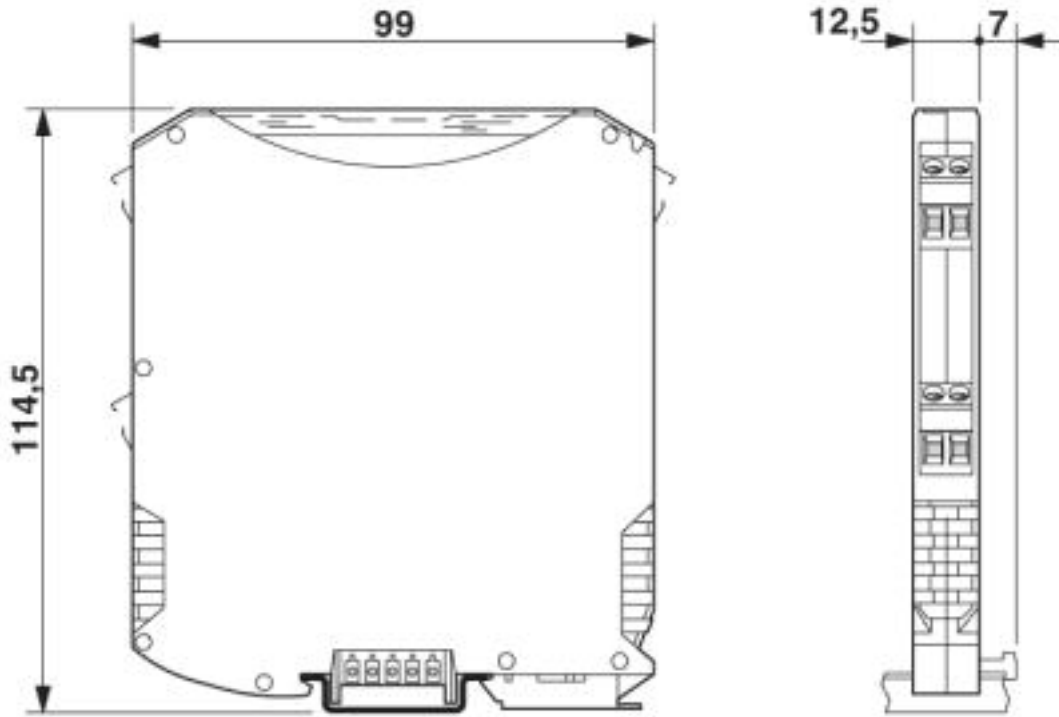
Temperature measuring transducer - MACX MCR-EX-SL-TC-I-NC - 2865586

Block diagram



Temperature measuring transducer - MACX MCR-EX-SL-TC-I-NC - 2865586

Dimensioned drawing



© Phoenix Contact 2013 - all rights reserved
<http://www.phoenixcontact.com>