

# Temperature measuring transducer - MACX MCR-SL-RTD-I-NC - 2865078

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Temperature transducer, converts signals from resistance thermometers and resistors into 0/4 - 20 mA signals. Freely programmable, 3-way electrical isolation, SIL 2.

## Product Features

- ✓ Power supply possible via DIN rail connector
- ✓ Installation in zone 2, protection type "n" (EN 60079-15) permitted
- ✓ Up to SIL 2 according to EN 61508
- ✓ 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
- ✓ Programming during operation and also voltage-free using IFS-USB-PROG-ADAPTER programming adapter
- ✓ 3-way electrical isolation
- ✓ Input for resistance thermometers and resistance-type sensors
- ✓ 0 ... 20 mA or 4 ... 20 mA output



## Key commercial data

Packing unit	1 pc
Weight per Piece (excluding packing)	140.0 GRM
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
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## Dimensions

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## Technical data

### 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
Maximum altitude	≤ 2000 m
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Degree of protection	IP20

### Input data

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)
Input signal range	0 Ω ... 2000 Ω
Cable resistance	50 Ω per line
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 <sub>pp</sub>
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
Max. current consumption	< 40 mA (24 V DC)
Power consumption	< 1 W

### Connection data

Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	2.5 mm <sup>2</sup>
Conductor cross section stranded min.	0.2 mm <sup>2</sup>
Conductor cross section stranded max.	2.5 mm <sup>2</sup>
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max.	14
Stripping length	7 mm

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### Connection data

Screw thread	M3
Connection method	Screw connection
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

### General

Temperature coefficient, typical	0.01 %/K
Step response (0–99%)	typ. 800 ms (With SIL)
	max. 1200 ms (With SIL)
	typ. 700 ms (Without SIL)
	max. 1100 ms (Without SIL)
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
Housing material	PA 66-FR
Color	green
Designation	Input/output/power supply
Electrical isolation	2.5 kV (50 Hz, 1 min., test voltage)
	300 V <sub>rms</sub> (Rated insulation voltage (surge voltage category II; pollution degree 2, safe isolation as per EN 61010-1))
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 3G Ex nA ic IIC T4 Gc X
Functional Safety (SIL)	SIL 2 according to EN 61508

### 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)	91.3 %

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## Technical data

### Safety characteristic data

MTBF	119 Years
$\lambda_{SU}$	$1.5 \times 10^{-7}$ (150 FIT)
$\lambda_{SD}$	$4.61 \times 10^{-7}$ (461 FIT)
$\lambda_{DU}$	$3.23 \times 10^{-7}$ (323 FIT)
$\lambda_{DD}$	$3.18 \times 10^{-8}$ (31.8 FIT)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	$1.3 \times 10^{-4}$ (1 year)
	$2.6 \times 10^{-4}$ (2 years)
	$3.91 \times 10^{-4}$ (3 years)
	$6.51 \times 10^{-4}$ (5 years)
	$9.11 \times 10^{-4}$ (7 years)
	$1.04 \times 10^{-3}$ (8 years)
Diagnostic coverage (DC)	90.2 %
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)	91.3 %
MTBF	119 Years
$\lambda_{SU}$	$1.5 \times 10^{-7}$ (150 FIT)
$\lambda_{SD}$	$4.61 \times 10^{-7}$ (461 FIT)
$\lambda_{DU}$	$3.23 \times 10^{-7}$ (323 FIT)
$\lambda_{DD}$	$3.18 \times 10^{-8}$ (31.8 FIT)
Probability of a hazardous failure per hour (PFH <sub>D</sub> )	$3,23 \times 10^{-8}$
Diagnostic coverage (DC)	90.2 %

## Classifications

### eCl@ss

eCl@ss 4.0	27200206
eCl@ss 4.1	27200206
eCl@ss 5.0	27200206
eCl@ss 5.1	27210121
eCl@ss 6.0	27200206
eCl@ss 7.0	27200206
eCl@ss 8.0	27200206

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## Classifications

### ETIM

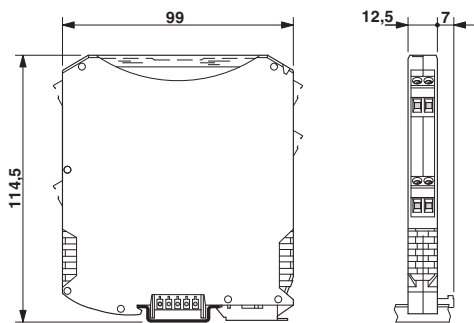
ETIM 2.0	EC001446
ETIM 3.0	EC001446
ETIM 4.0	EC001446
ETIM 5.0	EC001446

### UNSPSC

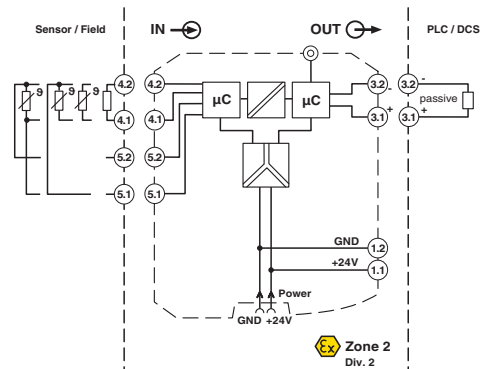
UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	39121008

## Drawings

Dimensioned drawing



Block diagram



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