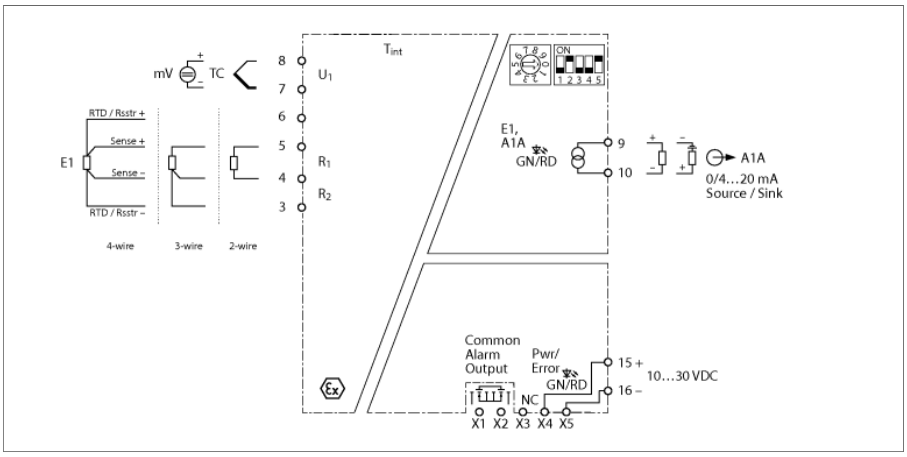
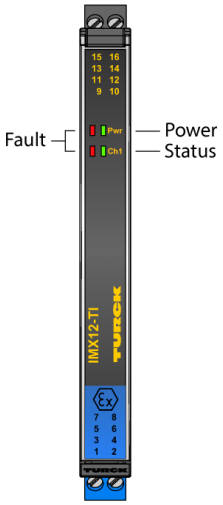
Temperature measuring amplifier
1-channel
IMX12-TI02-1TCURTDR-1I-PR/24VDC





The temperature transducers in the IMX12-TI02… product series are equipped with intrinsically safe input circuits and can be used for the galvanically isolated transmission of temperature-dependent measured values from the Ex area to the non-Ex area. The devices are suitable for operation in Zone 2. Thermocouples, low voltages, RTD sensors and resistors can be connected to the devices in the Ex area.

The temperature transducer IMX12-TI02-1TCURTDR-1I-PR/24VDC features an input for thermocouples in accordance with IEC 60584, DIN 43710, GOST R 8.585-2001, low voltages (-150…+150 mV), RTD sensors in accordance with IEC 60751, DIN 43760, GOST 6651-94 (2-, 3- or 4-wire) and 0…5-kΩ resistors (2-, 3- or 4-wire). The current output can be set to 0/4…20 mA and operated either as source or sink.

Input and output circuits are monitored for wire breaks. The device signals all detected internal faults (e.g. an input value outside the characteristic curve of the sensor) with a permanently red LED and the output of a fault current. Via the Power-Bridge connection, the device can be supplied and a group fault signal can be transmitted.

The devices are configured via DIP and rotary coding switches on the device side. The set measuring mode (TC, RTD, low voltage, resistor) determines the selection options shown for the other input parameters. The measuring range is defined by setting a start value and an end value within the measured value limits of the connected sensor.

The devices each have one green and one red power LED (Pwr) and one green and one red channel LED (Ch…) for status indication. The device signals all detected internal faults (e.g. an input value outside the characteristic curve of the sensor) with a permanently red Ch… LED and—depending on the parameterization—with the output of a current signal of < 1 mA or > 21 mA. In the event of a wire break in the current output, the red Ch… LED flashes twice repeatedly and the green Ch… LED is constantly illuminated.

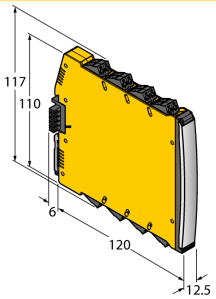
The device can be used in safety circuits up to SIL 2 (high and low demand according to IEC 61508) (hardware fault tolerance HFT = 0).

The device is equipped with removable screw terminals.

- Input for thermocouples, low voltages (-150…+150 mV), RTDs (2-, 3- and 4-wire) and 0…5 kΩ resistors (2-, 3- and 4-wire)
- Current output 0/4…20 mA either as source or sink
- Adjustable measuring range
- Configuration via rotary coding switches and DIP switches
- Wire-break monitoring of input and output circuits
- Complete galvanic isolation
- Input reverse-polarity protected
- Removable screw terminals
- Power bridge (connector incl. in delivery)
- ATEX, IECEx, INMETRO, TR CU, NEPSI
- Installation in zone 2
- SIL 2

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Dimensions



ID	7580500
Nominal voltage	24 VDC
Operating voltage U_B	10…30 VDC
Power consumption	≤ 2 W
Power dissipation, typical	≤ 1.6 W
Input circuits	RTD Type DIN EN 60751 Pt50, Pt100, Pt 500, Pt1000 RTD Type DIN EN 43760 Ni50, Ni100, Ni500, Ni1000 RTD Type Gost 6651-94 Pt50, Pt100, Pt 500, Pt1000, CU50, Cu53, Cu100, CU500, CuZn100 TC Type DIN EN 60584 Type A, Type B, Type C, Type E, Type J, Type K, Type N, Type R, Type S, Type T TC Type DIN 43710 Type L TC Type Gost 8.585-2001Type A1, Type A2, Type A3, Type L, Type M Low voltage input -150…150 mV Resistance input 0…5000 ohms
Thermocouples	-50…200°C; 0…400°C; 0…600°C
Output circuits	
Output current	Source/sink (10…30 V) 0/4…20 mA
Load resistance current output	≤ 0.8 kΩ
Power-Bridge common alarm output	MOSFET, Umax = 30 V, Imax = 100 mA
Response characteristic	
Reference temperature	23 °C
Measuring accuracy current output (including linearity, hysteresis and repeatability)	± 10 µA
Temperature drift analog output	0.0025 %/K
Accuracy, RTD input, 0…500 ohm	± 50 mΩ
Temperature drift, RTD input, 0…500 ohm	± 5 mΩ/K
Accuracy, RTD input, 500…5000 ohm	± 500 mΩ
Temperature drift, RTD input, 500…5000 ohm	± 30 mΩ/K
Measuring accuracy TC input (including linearity, hysteresis and repeatability)	± 15 µV
Temperature drift, TC input	± 3.2 µV/K
Cold junction compensation error	with cold junction compensation < 2 K
Note	With a 3-wire connection, the errors double
Galvanic isolation	
Test voltage	2.5 kV RMS
Input 1 to output 1	375 V peak value acc. to EN 60079-11
Input 1 to supply	375 V peak value acc. to EN 60079-11
A1A supply voltage	300 V RMS acc. to EN 50178 and EN 61010-1

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Important note	The values provided below indicate the relevant markings associated with the product's Ex certificates.
Ex approval acc. to conformity certificate	TÜV 15 ATEX 168214 X
Application area	II (1) G, II (1) D
Ignition protection category	[Ex ia Ga] IIC; [Ex ia Da] IIIC
Application area	II 3 (1) G
Ignition protection type	Ex ec [ia Ga] IIC T4 Gc
Important note	If the device is used in applications to achieve functional safety according to IEC 61508, the safety manual must be used. Information in the data sheet are not valid for functional safety.
Use in SIL safety circuits	SIL 2 acc. to IEC 61508

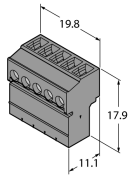
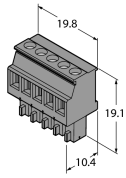
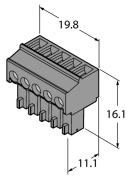
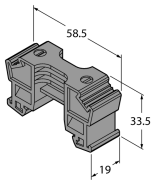
Displays/Operating elements	
Operational readiness	Green
Switching state	Yellow
Error indication	red

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Mechanical data		
Protection class	IP20	
Flammability class acc. to UL 94	V-0	
Ambient temperature	-25…+70 °C	
Storage temperature	-40…+80 °C	
Dimensions	120 x 12.5 x 117 mm	
Weight	182 g	
Mounting instructions	DIN rail (NS35)	
Housing material	Plastic, Polycarbonate/ABS	
Electrical connection	Removable screw terminals, 2-pin	
Connection variant	Power bridge with collective fault signal	
Terminal cross-section	0.2…2.5 mm² (AWG: 24…14)	
Tightening torque	0.5 Nm	
Tightening torque	4.43 LBS-Inch	
Environmental conditions	Operating height	Up to 2000 m above sea level
	Pollution degree	II
	Surge/Overvoltage category	II (EN 61010-1)
	Standards used	
	Voltage resistance and insulation	
		EN 50178
		EN 61010-1
		EN 50155
		GL VI-7-2
	Shock	
		EN 61373 class B
		EN 50155
		GL VI-7-2
		EN 60068-2-6
		EN 60068-2-27
	Temperature	
		EN 60068-2-1 Ad
		EN 50155
		GL VI-7-2
		EN 60068-2-2 Bd
		EN 60068-2-1
	Air humidity	
		EN 60068-2-38
	EMC	
		EN 50155
		GL VI-7-2
		NE21
		EN 61326-1
		EN 61326-3-1
		EN 61000-4-2
		EN 61000-4-3
		EN 61000-4-4
		EN 61000-4-5
		EN 61000-4-6
		EN 61000-4-11
		EN 61000-4-29
		EN 55011
		EN 55016
		EN 50121-3-2
		EN 61000-6-2

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Accessories

Type code	Ident-No.		Dimension drawing
IMC 1.5/ 5-ST-3.81 BK	7580954	Power Bridge Connection Terminal	
MCVR 1.5/ 5-ST-3.81 BK	7580955	Power Bridge Connection Terminal	
MC 1.5/ 5-ST-3.81 BK	7580956	Power Bridge Connection Terminal	
E/ME TBUS NS35 BK	7580957	Power Bridge Connection Terminal	
IMX12-SC-2X-4BK	7580940	Screw terminals for IM(X)12 modules; included in delivery: 4 pcs. of 2-pin black terminals	
IMX12-SC-2X-4BU	7580941	Screw terminals for IM(X) 12 modules; included in delivery: 4 pcs. of 2-pin blue terminals	
IMX12-CC-2X-4BK	7580942	Spring terminals for IM(X)12 modules; included in delivery: 4 pcs. black terminals, 2-pin	
IMX12-CC-2X-4BU	7580943	Spring terminals for IM(X)12 modules; included in delivery: 4 pcs. blue terminals, 2-pin	

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