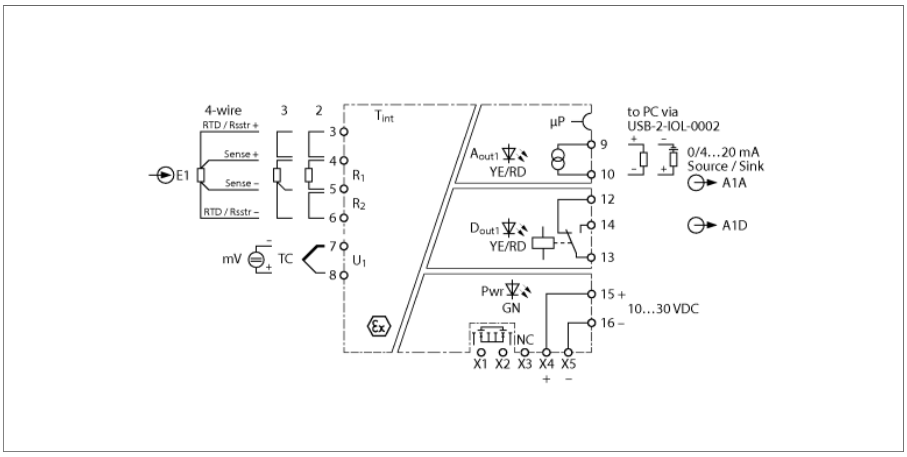
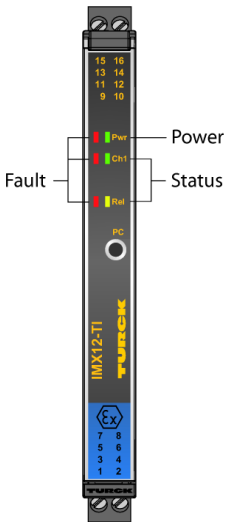
# Temperature measuring amplifier
# 1-channel
# IMX12-TI02-1TCURTDR-1I1R-CPR/24VDC




The 1-channel temperature measuring amplifier IMX12-TI02-1TCURTDR-1I1R-CPR/24VDC has inputs for: Thermocouples acc. to IEC 60584, DIN 43710, GOST R 8.585-2001, low voltages (-150 … +150 mV), RTDs acc. to IEC 60751, DIN 43760, GOST 6651-94 (2, 3 and 4-wire) and resistors 0…5 kΩ (2, 3 and 4-wire). The device can be powered from a power bridge that also transmits a collective fault signal.

The cold junction compensation can be set to internal, external, or to a constant value. The device is configured via the PC interface. The current outputs can be set to 0/4 … 20 mA and source or sink. The unit features an additional invertible changeover relay output, to monitor a limit on over- or undershoot or a window function.

A green LED indicates operational readiness. A fault in the input circuit leads to a flashing red LED according to NE44, an internal error to a steady read LED. The fault current can be adjusted to < 3.5 mA or > 21.5 mA.

The device can be used in safety circuits up to SIL2 (high and low demand according to IEC 61508) and meets the requirements of the NE21. It is equipped with removable screw terminals.

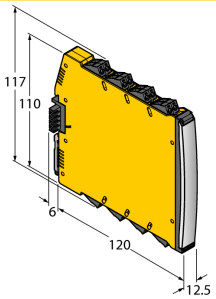
The device is equipped with removable screw terminals.

- Input circuits monitored for wire-break and short-circuit
- Parameterized via PC
- Complete galvanic isolation
- Removable screw terminals
- Power bridge (connector incl. in delivery)
- ATEX, IECEx, cFM, cUL, NEPSI, IN-METRO, Kosha, TS
- Use in Zone 2
- SIL 2

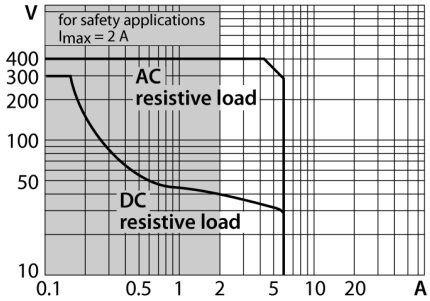
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| | |
|---|---|
| ID | 7580504 |
| Nominal voltage | 24 VDC |
| Operating voltage $U_B$ | 10…30 VDC |
| Power consumption | ≤ 2 W |
| Power dissipation, typical | ≤ 1.6 W |
| Input circuits | RTD Type DIN EN 60751 Pt50, Pt100, Pt 500, Pt1000<br>RTD Type DIN EN 43760 Ni50, Ni100, Ni500, Ni1000<br>RTD Type Gost 6651-94 Pt50, Pt100, Pt 500, Pt1000, CU50, Cu53, Cu100, CU500, CuZn100<br>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<br>TC Type DIN 43710 Type L<br>TC Type Gost 8.585-2001Type A1, Type A2, Type A3, Type L, Type M<br>Low voltage input -150…150 mV<br>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 |
| Output circuits (digital) | 1 x relay (change-over) |
| Output switching voltage relay | ≤ 30 VDC / ≤ 250 VAC |
| Switching current per output | ≤ 2 A |
| Switching capacity per output | ≤ 500 VA/60 W |
| Switching frequency | ≤ 15 Hz |
| Contact quality | AgNi |
| 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 |
| A1D supply voltage | 300 V RMS acc. to EN 50178 and EN 61010-1 |
| A1A-A1D | 300 V RMS acc. to EN 50178 and EN 61010-1 |

## Dimensions




## Output relay – Load curve




Edition • 2026-01-13T18:12:12+01:00

| | |
|---|---|
| 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 nA [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 |

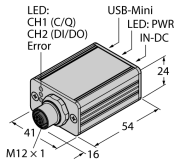
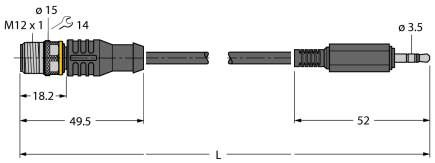
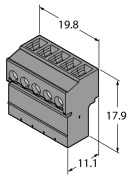
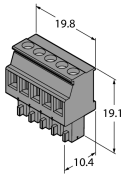
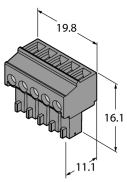
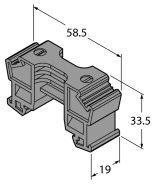
| Displays/Operating elements | |
|---|---|
| Operational readiness | Green |
| Switching state | Yellow |
| Error indication | red |

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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 | 173 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 |

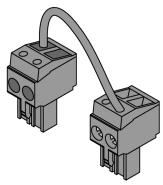
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## Accessories

| Type code | Ident-No. | | Dimension drawing |
|---|---|---|---|
| USB-2-IOL-0002 | 6825482 | IO-Link Master with integrated USB port |   |
| IOL-COM/3M | 7525110 | IO-Link communication line for connecting IO-Link devices to an IO-link master via a 3.5-mm jack plug |   |
| 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 |   |

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## Accessories

| Type code | Ident-No. | | Dimension drawing |
|---|---|---|---|
| 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 | |
| IMX12-2-CJT | 100003646 | |  |

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