Temperature measuring amplifier
1-channel
IM34-11EX-CI/K60

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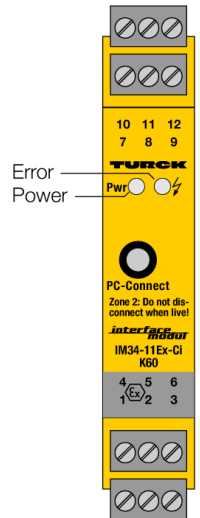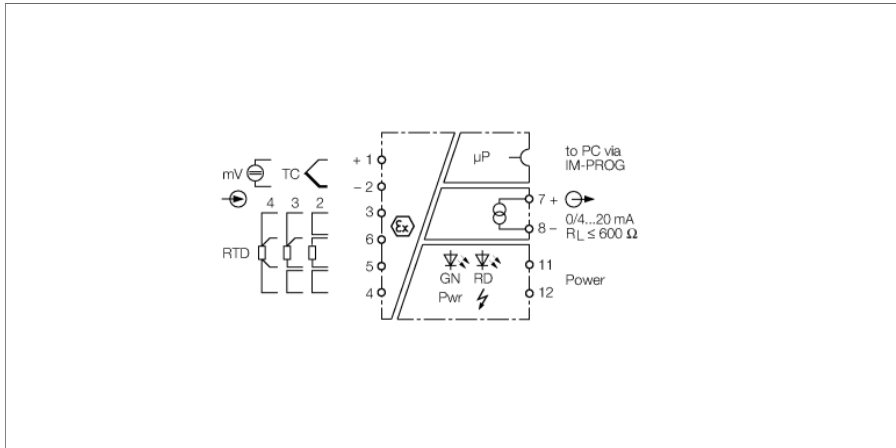
The 1-channel temperature measuring amplifier IM34-11Ex-CI/K60 is designed to evaluate the temperature-dependent changes of Ni100/Pt100 (RTD), thermocouples (TC) types B, E, J, K, L, N, R, S and T or low voltages in a range of -160…+160 mV and to output them as temperature-linear current signals of 0/4…20 mA. Alternatively, RTDs in 2, 3 or 4-wire technology can be operated at the input circuit of the measuring amplifier. The Ni100/Pt100 input can either be used as external cold junction compensation for the thermocouple or as independent measuring input.

If the thermocouple leads are led up to a temperature measurement amplifier, we recommend to use the cold junction compensation module IN IM 3-CJT from TURCK (ident-No.: 6900524). This way the maximum possible accuracy is achieved. In order to increase the measurement speed with fast temperature changes on thermocouples, the device switches into the "Fast Mode" after 200 ms at the very latest after a gradient of 200 µV/s has been exceeded. Thereafter the cycle time of the thermal voltage measurement is < 80 ms. This means that no wire-break monitoring and no measurement of the cold junction temperature will occur. After the gradient drops below 80 µV/s the device will switch back to "Normal Mode".

Thermocouple	„Fast Mode" 200 µV/s	„Normal Mode" 80 µV/s	Temperature range
Type B	20 K/s	8 K/s	1100 °C
Type E	2.6 K/s	1 K/s	0…1000 °C
Type J	3.5 K/s	1.5 K/s	0…1200 °C
Type K	5 K/s	1.6 K/s	0…1372 °C
Type L	3.5 K/s	1.5 K/s	0…900 °C
Type N	5.7 K/s	2.3 K/s	100…1300 °C
Type R	20 K/s	8 K/s	400…1768 °C
Type S	18 K/s	7 K/s	400…1768 °C
Type T	4 K/s	1.5 K/s	150 °C

The following table shows the approximate temperature gradients for the corresponding thermocouples.

NOTE: The temperature gradients in the table are only approximate values for defined temperature ranges. For the precise determination of the temperature gradient the characteristic of the sensor in question and the associated operating point must be included.
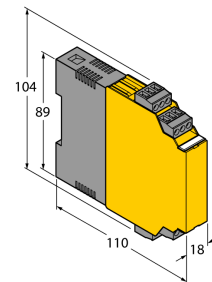
The devices are parametrized and configured via PC with the software tool "Device Type Manager" (DTM). For this, connect the temperature measuring amplifier to the PC with the 3.5 mm jack plug on the front. The ready-made transmission cable can be ordered from TURCK under the type name IM-PROG (ident no. 6890422). The following settings can be made with the DTM:

- Measurement mode (RTD, TC, low voltage, line compensation)
- Measuring point (32 freely selectable characters)
- Temperature (°C or °F)
- RTD connection mode (2, 3 and 4-wire technology)
- Cold-junction compensation (internla or via external RTD) NOTE: If the thermocouple leads are led up to a temperature measurement amplifier, we recommend to use the cold junction compensation module IN IM 3-CJT from TURCK (ident-No.: 6900524).
- Measuring range mapped on the power source
- Output current (0/4…20 mA)
- Fault current (0 resp. < 20 mA)

The signals are transformed according to ITS 90/IEC 584 for thermocouples and according to IEC 751 for Pt100 RTDs and provided temperature linear at the current output.
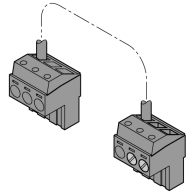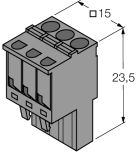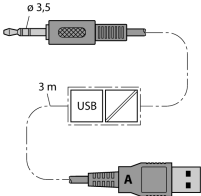
- Input for Pt100/ Ni100 resistors, thermocouples and millivolt signals in 2, 3 or 4-wire technology
- Suitable for fast temperature changes, starting with a thermal gradient of 200 µV/s
- Parameterized using PACTware
- Output: 0/4…20 mA
- Complete galvanic isolation
- Input reverse-polarity protected
- ATEX, IECEx, cFMus, UL, TR CU, INMETRO, CCOE
- Installation in zone 2

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Type	IM34-11EX-CI/K60
ID	7506636

Operating voltage	20…250 VAC
Frequency	40…70 Hz
Operating voltage	20…125 VDC

Input circuits	Intrinsically safe acc. to EN 60079
	Thermocouple
	Pt100
	Ni100
	mV signals
Pt100	(IEC 751), 2, 3 and 4-wire technology
Ni100	(DIN 43760), 2, 3 and 4-wire technology
Probe current	≤ 0.2 mA
Thermocouples	B, E, J, K, N, R, S, T (ITS 90/IEC 584), L (DIN 43710)
Voltage input	-0.160…+0.160 VDC

Output circuits	
Output current	0/4…20 mA
Fault current	0 / 22 mA adjustable
Switching frequency	≤ 1 Hz

Output	Adjustable output mode

Response characteristic	
Reference temperature	23 °C
Measuring accuracy current output (including linearity, hysteresis and repeatability)	± 5 µA
Temperature drift analog output	0.0025 %/K
Measuring accuracy RTD input (including linearity, hysteresis and repeatability)	± 50 mΩ
Temperature drift RTD input	± 3 mΩ/K
Measuring accuracy TC input (including linearity, hysteresis and repeatability)	± 15 µV
Temperature drift TC input	± 3.2 µV/K (of 320 mV)
Cold junction compensation error	2-wire < 100mΩ after line compensation
	3-wire < 100mΩ with asymmetrical wiring
	4-wire < 50mΩ
	with cold junction compensation < 2 K
	with IM-3-CJT < 1K

Galvanic isolation	
Test voltage	2.5 kV RMS

Important note	For Ex-applications the values specified in the corresponding Ex certificates (ATEX, IECEx, UL, etc.) apply.
Ex approval acc. to conformity certificate	TÜV 02 ATEX 1898
Application area	II (1) G, II (1) D
Ignition protection category	[Ex ia Ga] IIC ; [Ex ia Da] IIIC ;
Ex approval acc. to conformity certificate	TÜV 06 ATEX 552978 X
Application area	II 3 G
Ignition protection type	Ex nA [ic Gc] IIC T4
Characteristic	linear

Mechanical data	
Protection class	IP20
Flammability class acc. to UL 94	V-0
Ambient temperature	-25…+70 °C
	-25 ... +60 °C für UL, FM
Storage temperature	-40…+80 °C
Dimensions	104 x 18 x 110 mm
Weight	133 g
Mounting instructions	DIN rail (NS35) or panel
Housing material	Polycarbonate/ABS
Electrical connection	4 × 3-pin removable terminal blocks, reverse polarity protected, screw terminal
Terminal cross-section	1 × 2.5 mm²/2 × 1.5 mm²
Tightening torque	0.5 Nm

Accessories

Type code	Ident no.		Dimension drawing
IM-3-CJT	6900524	Cold junction compensation module for IM 34 temperature measuring amplifiers, width 18 mm	
IM-CC-3X2BU/2BK	6900475	Cage clamp terminals for IM modules (Ex-devices with 18 mm overall width); includes: 2 pcs. 3-pin blue terminals and 2 pcs. 3-pin black terminals.	
IM-PROG III	7525111	USB-compatible programming adapter for the FDT/DTM-based parametrization of HART-capable Turck devices; galvanic separation between the device to be parametrized and the PC	