CZAKI THERMO-PRODUCT
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PROGRAMMABLE HEAD-MOUNT TRANSMITTER

TEH series

- ☐ output signal 4 ... 20 mA (**TEH-27**, **TEH-28**)
  0 ... 10 V (**TEH-37**, **TEH-38**)
- ☐ **input - output galvanic insulation** (**TEH-28**, **TEH-38**)
- ☐ programmable input signal range
- ☐ programmable sensor type: Pt100, Ni100, J, K, N, S, R, B, T
- ☐ RTD sensor can be connected in 2, 3 or 4-wire system
- ☐ internal or external compensation of thermocouple cold junction
- ☐ for mounting in type B connection heads

The transmitter TEH is designed to convert resistance of temperature sensor or voltage of thermocouple sensor to standard current signal 4...20 mA (TEH-27, TEH-28) or voltage 0...10V (TEH-37, TEH-38).
Transmitters TEH-28 and TEH-38 provide galvanic insulation between input and output terminals.
Most parameters such as: sensor type, input signal range or mode of cold junction compensation, may be adapted by user for specific requirements of his measuring system.
The transmitter is programmed using a personal computer with USB port via **IF-2013U** interface which is also offered.
The housing is dedicated to mounting in type B connection heads.

TECHNICAL DATA

Sensor type, measuring range		programmable, see Table 1
Maxium range, accuracy, thermal drift		see Table 1
Pt100 or Ni100 sensor connection		2, 3 or 4-wire, programmable
Pt100 or Ni100 connection resistance (2 and 3-wire)		$<$10 Ω (each wire)
Maximum resistance for 2-wire connection which can be corrected with software		0,00 ...20,00 Ω (sum of both wires)
Bias current of Pt100 or Ni100 sensors		$<$ 0,25mA
Compensation of thermocouple cold junction		internal or external, programmable
Maximum error of thermocouple cold junction internal compensation		±1 °C
Temperature range of thermocouple cold junction external compensation		-50,0 ... 100,0 °C
Range of temperature offset		-10,0 ... 10,0 °C
Galvanic insulation between input and output terminals (TEH-28 and TEH-38)		500 V AC
Output signal	TEH-2x	4 ... 20 mA or 20 ... 4 mA, programmable
	TEH-3x	0 ... 10 V or 10 ... 0 V, programmable
Linear region of output signal	TEH-2x	3,8 ... 20,5 mA
	TEH-3x	0,0 ... 10,3 V
Output signal delay after power on		ca. 5 s
Digital filter time constant (1st order filter))		selected: 0,2; 1; 2; 4; 8; 16; 32 s
Sensor failure indication	TEH-2x	3,5 or 23 mA, programmable
	TEH-3x	0 or 11,5 V, programmable
Power supply	TEH-2x	8 ... 36 V DC / 24 mA (from current loop)
	TEH-3x	14 ... 36 V DC / 18 mA
Ambient temperature		-20 ... +70 °C
Dimensions (diameter x height) / weight		44 x 21 mm / ca. 50 g

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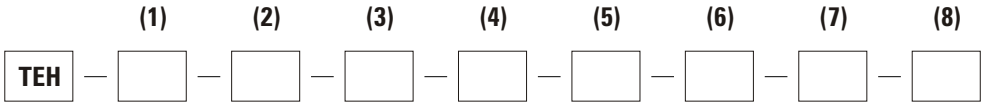
Table 1. Summary of sensor types, input signal ranges and accuracy.

Sensor type	Measuring range [°C]	Minimal measuring range [°C] (1)	Accuracy- largest value (2),(3)	Thermal drift / 10°C - largest value (2),(4)
B PtRh30-PtRh6	400 ... 1800	200	0,2% or ±5°C	0,07% or ±1,5°C
J Fe-CuNi	-100 ... 1000	50	0,2% lor ±1°C	0,07% or ±0,7°C
K NiCr-NiAl	-100 ... 1200	50		
N NiCrSi-NiSi	-100 ... 1300	100		
R PtRh13-Pt	0 ... 1600	200	0,2% or ±2°C	0,07% lor ±1,5°C
S PtRh10-Pt	0 ... 1600	200		
T Cu-CuNi	-100 ... 400	50	0,2% or ±1°C	0,07% or ±0,7°C
Pt100	-100 ... 800	30	0,15% or ±0,2°C	0,05% or ±0,1°C
Ni100	-60 ... 180	30		
Voltage [mV]	-10 ... 65 mV	2 mV	0,2% or ±0,05mV	0,07% or ±0,03mV
Resistance [Ω]	60 ... 370 Ω	20 Ω	0,15% or ±0,1 Ω	0,05% or ±0,05 Ω

(1) Minimum difference between upper and lower range value.
(2) Error values in [%] are relative to user-defined range.
(3) The ambient temperature = 23 °C.
(4) Thermal drift means that the error may change with the ambient temperature.

ORDERING CODE



(1)	Model of transmitter	**27** output 4 ... 20 mA, without insulation **37** output 0 ... 10 V, without insulation **28** output 4 ... 20 mA, with insulation **38** output 0 ... 10 V, with insulation
(2)	Sensor type	**Pt100**, **Ni100**, **J**, **K**, **N**, **S**, **R**, **T**, **mV**, **Ohm**
(3)	Lower range value	value in [°C], [mV] or [Ω] (default lowest value for selected sensor type)
(4)	Upper range value	value in [°C], [mV] or [Ω] (default highest value for selected sensor type)
(5)	Connecting Pt100, Ni100 or thermocouple cold junction compensation	**2**(...)(*), **3**, **4** - wires **I** - internal (automatic), **E**(...)(**) - external (user defined)
(6)	Converting characteristic	**N** - normal (4 ...20 mA, 0 ... 10 V), **R -** reverse (20 ... 4 mA, 10 ... 0 V)
(7)	Time constant of digital filter [s], selected	**0**, **1**, **2**, **4**, **8**, **16**, **32** (0 really means 0,2 s)
(8)	Alarm output signal	**H** - high level (23 mA or 11,5 V), **L** - low level (3,5 mA or 0 V)

(*) Sum of resistances of wires can be given in brackets.
(**) Thermocouple cold junction temperature must be given in brackets.

Default values marked by under-scoring. Factory programmed in case of incomplete ordering code.
The specification of the model, i.e. point (1) is compulsory.

Example for order: TEH-27-Pt100-0-150-2(0,8)-N-2-L denotes Pt100 temperature transmitter for range 0 ... 150°C with 4 ... 20 mA signal output. The sensor is connected with two wires (sum of resistances of wires = 0,8 Ω); time constant = 0.5 s; in the case of sensor failure, output current is 3,5 mA.

TEH-38-K-0-600-I-N-1-H denotes thermocouple K temperature transmitter for range 0 ... 600 °C with 0 ...10V signal output galvanically insulated from sensor. Internal cold junction compensation; time constant = 1 s; in the case of sensor failure, output voltage is 11,5 V.