

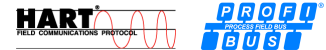
Tube Resistance Thermometer

- Type TP 21 / TW 59...T108/T141 -



FEATURES

- DEADSPACE-FREE TEMPERATURE MEASUREMENT
- NO CONTACTING WITH MEDIA
- FOR FOOD AND PHARMACEUTICAL INDUSTRIES
- ENTIRELY IN STAINLESS STEEL
- CORROSION RESISTANCE BY FIELD HOUSING
- CUSTOM-DESIGNED PROCESS CONNECTIONS
- OPTIONAL WITH TRANSMITTER



DESCRIPTION

The Tube Resistance Thermometers **Type TP21** meet, by their design layouts, the requirements for a deadspace-free and hygienic measurement in all kinds of fluid media, like e.g. milk, beer, juice etc. The measurement occurs without a profile modification and without contacting the media by the sensing resistor, taking into account the good response times. Therefore e.g. cleaning procedures by a pig etc. are possible.

The device consists of a pipe body with neck tube in stainless steel. Integrated in the pipe body is a PT100-thermometer. Optionally the measuring insert contains one or two measuring resistors PT100, connected via the terminal block of the housing head in 2-, 3- or 4-wire circuit.

The temperature sensors are to be integrated in the pipeline. Different connection versions for varying applications are available. By means of the special design of the housing head in a reliable stainless steel field housing, the sensors are especially suited for measuring tasks in corrosive and aggressive environmental conditions. Also with applications in a wet and humid environment and under extreme conditions the design in IP65 respectively IP67 guarantees robustness and high dependability.

The temperature sensors are customized to requirements in reference to temperature, length, resilience, vibration stability and measurement accuracy. For specific applications media contacted parts can be offered in a polished steel version.

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TECHNICAL DATA

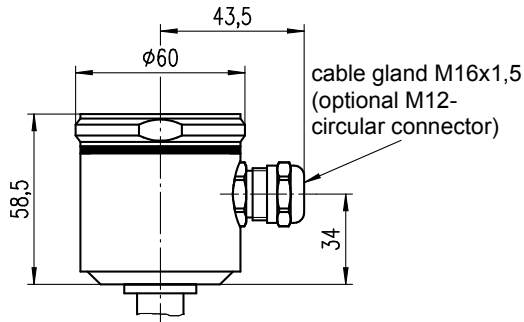
Constructive Layout	
Housing	field housing
Temperature sensor	PT 100 acc. EN 60751, changeable measurement insert (Standard), insert tube 1.4571
Measurement insert, electrical	1 x PT 100 in 2-, 3- or 4- wire connection, standard: 1 x 3- wire connection, 2 x PT 100 in 2- or 3-wire connection
Electrical connection	- M16 x 1,5 – cable gland, MS nickel-plated, - optional: M12 x 1 circular connector, 4-pins
Accuracy	- standard: tolerance class A acc. to EN 60751, - optional: tolerance class B 1/10, 1/5, 1/3, 1/2 DIN
Response time	T50 (measured in water): 6 sec. (dependent on design, d = 6 mm) < 4 sec. with tapered sensor tip on request
Measured medium temperature	T _{max} at sensor = -20... +200°C
Housing material	stainless steel 1.4301 (CrNiSt, standard-field housing)
Measuring section - material	stainless steel 1.4571, optional 1.4435 or 1.4404, optional: tube in polished steel
Protection class	EN 60529, IP 67 with cable gland, optional with cable connection
Pressure admissible	PN = 10 bar
CE-conformity	EMC-rules are fulfilled, CE-sign
Process Connection	
	- TP21 / TW 59...T108 milk pipe screw joint with threaded double-sided neck, DIN 11851, DN20...DN100, - TP21 / TW 59...T141 Tri-Clamp-connection acc. to ISO 2852 - other connections on request (please specify nominal width) - neck tube: 38,5 mm x d = 16 mm (acc. to drawing) - measuring section length: 120 mm (acc. to drawing)
Accessories	
	(please order separately, see data sheet "RTD- overview field housing designs")
Assembly components	None
Options	
Electrical connection	-- ceramic connection socket -- flexible connecting wires -- sheathed cable (shakeproof type) -- transmitter TE 42, programmable, 4...20 mA, 2- wire connection (standard) -- transmitter TE 41, programmable, galvanically isolated -- transmitter TE 52, HART -- transmitter TE 82, Profibus PA
Calibration	factory calibrated, calibration certificate (3-point or 5-point), with DKD-standard
Certificates	material certificate, acc. to EN 10204

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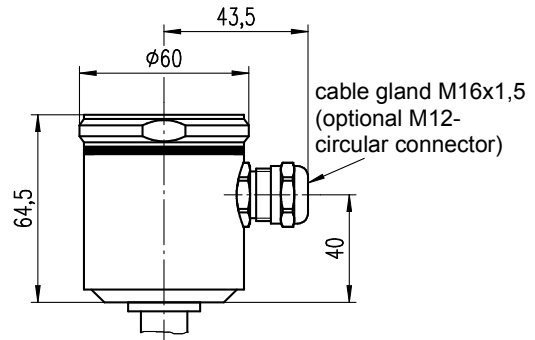
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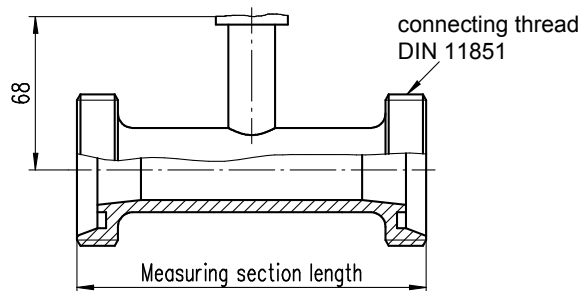
DIMENSIONAL DRAWINGS



TP21 / TW59...H...T108
housing head H



TP21 / TW59...P...T108
housing head P (for Profibus)

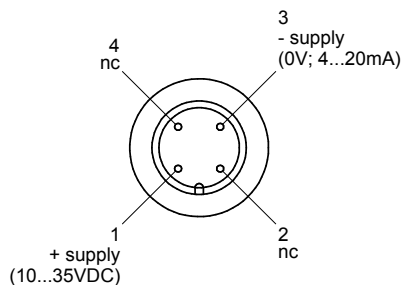


TP21 / TW59 ... T108
tube-resistance thermometer
DIN 11851 DN20 ... DN100
ISO 2852 1" ... 2 1/2"

ELECTRICAL CONNECTION

(execution example: M12-circular connector)

connection with transmitter



Response time for RTD (PT100 resistors)

The response time is not only determined by the dimensions of the protective tube, but extensively by the heat transmission:

- medium, flow velocity, etc.
- heat capacity

Higher flow velocities and heat capacities reduce the response time significantly.

The response time defines the period the measurement reaches 50% or 90% of the its final range value.

* connection without transmitter see field housing label

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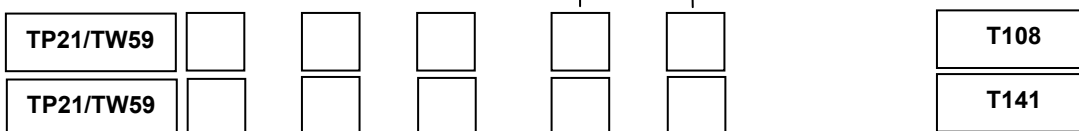
ORDER INFORMATION

Sensor Type, Tolerance Class, Connection	
A	1 x PT 100, class A, 2-wire
B	1 x PT 100, class A, 3-wire
C	1 x PT 100, class A, 4-wire
D	2 x PT 100, class A, 2-wire
E	2 x PT 100, class A, 3-wire

Connection Head	
H	field housing, 1.4301, M16 x 1,5
P	Profibus housing (enlarged field housing)
K	Form BUKH, polyamide PA (for double-transmitter)
1	Form B, aluminum-diecast
9	other

Measuring Section Length / Process Connection				Type
20	DN 20	120 mm	DIN 11851	T108
25	DN 25	120 mm	DIN 11851	T108
32	DN 32	120 mm	DIN 11851	T108
40	DN 40	120 mm	DIN 11851	T108
50	DN 50	120 mm	DIN 11851	T108
65	DN 65	120 mm	DIN 11851	T108
80	DN 80	120 mm	DIN 11851	T108
100	DN 100	120 mm	DIN 11851	T108
CI 1	1"	120 mm	ISO 2852	T141
CI 1 ½	1 ½"	120 mm	ISO 2852	T141
CI 2	2"	120 mm	ISO 2852	T141
CI 2 ½	2 ½"	120 mm	ISO 2852	T141
90	other			

Output type / Measurement Range		
K0	00	RTD (Pt100) output
L0		transmitter 4-20 mA, 2-wire connection
	30	0 - 50° C
	40	0 - 100° C
	50	0 - 150° C
	60	0 - 200° C
	70	0 - 300° C
	80	0 - 400° C
	99	other measurement ranges



ORDER INFORMATION for accessories / fittings

Options	(to be specified in plaintext)
Transmitter (programmable), not galvanically isolated	TE 4200
Transmitter (programmable), galvanically isolated	TE 4101
Transmitter (programmierbar), galvanically isolated EX	TE 4111 EX
Transmitter HART	TE 52
Transmitter Profibus PA	TE 82
Configuration-Set incl. adapter and software for TE 41/42	TZ 41/42
Accuracy class 1/3 DIN B (per PT 100)	
Accuracy class 1/5 DIN B (per PT 100)	
Accuracy class 1/10 DIN B (per PT 100)	
Sheathed cable (shakeproof type)	
Calibration certificate DKD (approval by certified DKD-laboratory)	
M12 x 1- connector, 4-pins	

Our products are constantly in further development, therefore subjects to modifications.

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