

## Compact RTD Temperature Sensor TR50



### Main features

- Compact and light weight
- Available with 4...20 mA transmitter or Pt100 output
- Available with hygienic as well as industrial process connections
- Programmable by FlexProgrammer 9701

### Applications

- Food & Beverage
- Laboratory & Medical
- Oil & Gas / Chemical
- Water & Waste water
- Energy
- Transportation & Logistics



### Technical specification

Housing	Compact Ø 18mm Stainless steel AISI 304 (1.4301)
El. connection	M12 or DIN 43650 plug
Output	Pt100 or 4...20mA
Sensor tube material	Stainless steel AISI 316L (1.4404) PEEK
Sensor diameter outside	Ø 6mm
Sensor length	< 3 000 mm
Standard response tip	Ø 6
Fast response tip	Ø 4 or Ø 3

### Time constant $\tau_{0,5}$

Sensor tip Ø 6mm	In water	3.0 sec.
Sensor tip Ø 4mm	In water	2.5 sec.
Sensor tip Ø 3mm	In water	1.3 sec.
Conical sensor	In water	<1.0 sec.

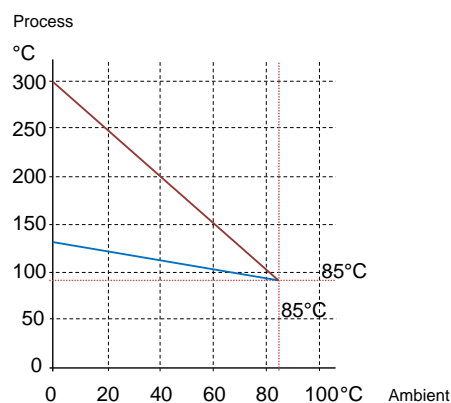
### Sensor element, Pt100 DIN/EN/IEC 60751

Pt100 DIN class B	$\pm (0.3 + 0.005 \times t) \text{ } ^\circ\text{C}$
Pt100 1/3 DIN class B	$\pm 1/3 \times (0.3 + 0.005 \times t) \text{ } ^\circ\text{C}$
Pt100 1/6 DIN class B	$\pm 1/6 \times (0.3 + 0.005 \times t) \text{ } ^\circ\text{C}$
Pt100 DIN class A	$\pm (0.15 + 0.002 \times t) \text{ } ^\circ\text{C}$
Single element	1 × Pt100
Double element	2 × Pt100
Connection	4-wire, 2 × 2 wire

### Environment

Ambient temperature	Pt100 output w. transmitter	-40...125°C -40...85°C
Process temperature		-50...250°C
Protection class		M12 : IP67 / DIN 43650 : IP65
Humidity		<100% RH, condensing
Vibrations		GL, test 2

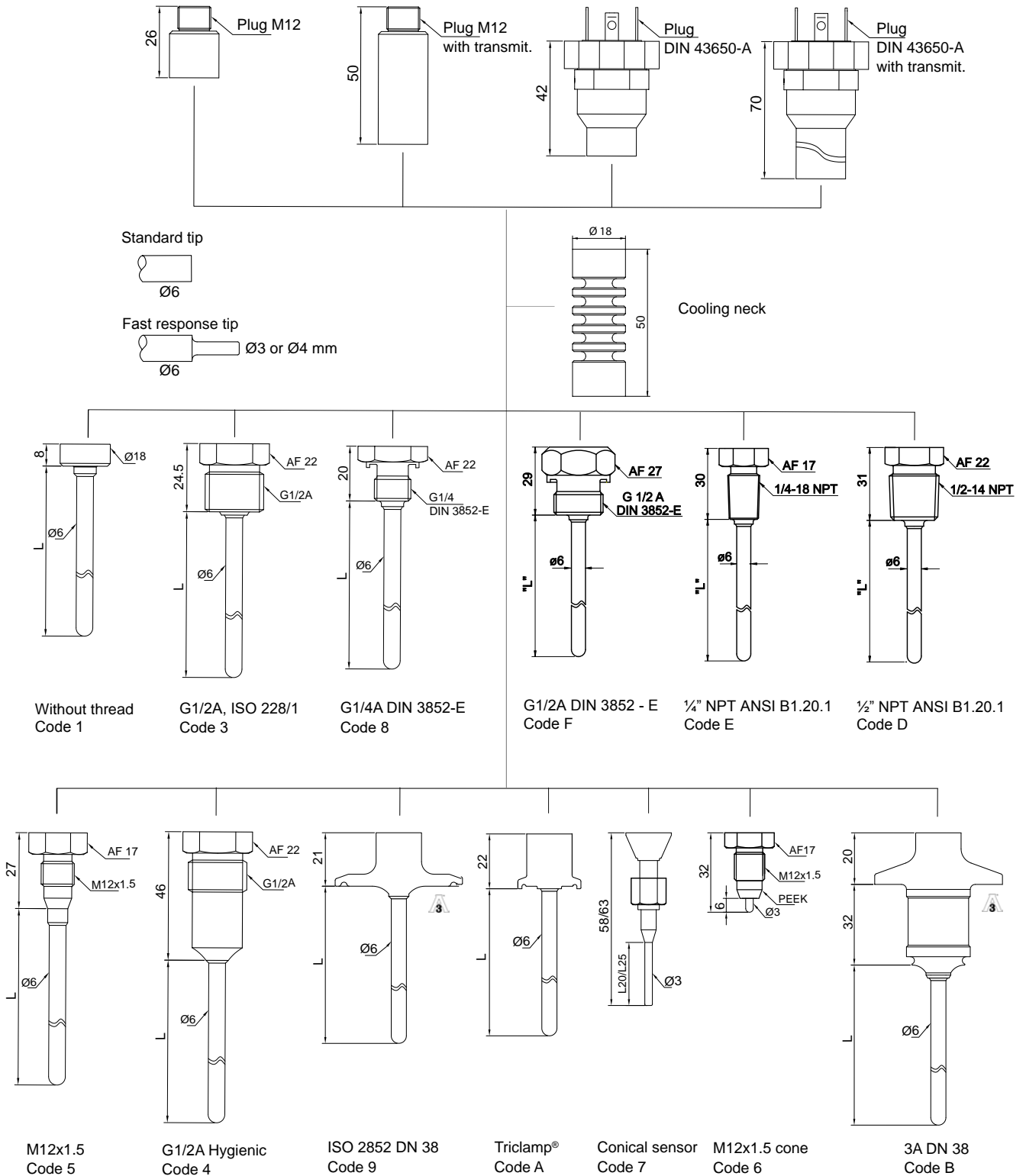
### Temperature curve



— with cooling neck

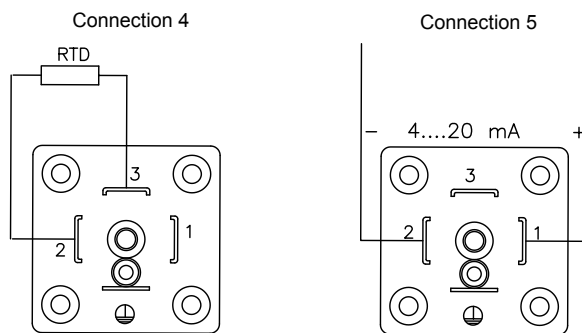
— without cooling neck

Dimensions (mm) and constructions details

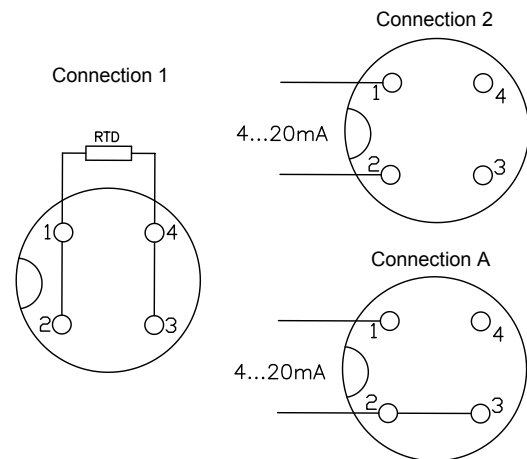


## Electrical connections

### Plug DIN 43650-A



### M12 Plug



## Transmitter

Input	
Accuracy	< 0.25°C (@ ≤ 100°C)
Sample time	< 0.7 sec.
Pt100 standard	IEC/DIN/EN 60 751-2
RTD measuring current	0.3 mA, continuously
Error detection delay	< 10 sec.
Measuring unit	°C or °F
Minimum span	25°C
Protection	± 35 VDC
Suppression	50 and 60 Hz
Resolution	14 bit
Repeatability	< 0.1°C
Ripple immunity	IEC 770 6.2.4.2
Offset adjustment	Max. ± 10°C
Isolation, sensor to case	50 VAC (test 500V)
Other data	
Temperature drift	Typ. 0.003% per °C Max. 0.01% per °C
Power-on time	20 sec.

Output	
Signal span	4...20 mA, 2-wire
Accuracy	< 0.1% of signal span
Supply range	8...35 VDC
Ripple immunity	3 Vms
Load equation	$RL \leq (VDC - 8)/23$ [kOhm]
Up/Down scaling limits	23 mA/3.5 mA
Damping	0...30 sec.
Protection	Reserved polarity protection
Resolution	12 bit
Effect of variations in supply voltage	
Output current	0.01% per volt

Environmental conditions	
Operating temperature	-40...85°C
Storage temperature	-55...90°C
Long-term test	IEC 770 6.3.2

EMC data	
Generic standards	EN 61000-6-3, EN 61000-6-2
Product standard	EN 61326
Namur	NE21

## Ordering details

				TE2	-	x	.	x	.	x	x	x	x	.	xxxx	.	x
<b>Model</b>				TE2													
Compact temperature sensor																	
<b>Sensor tip</b>																	
Not specified	For connection code 6 & 7																
Standard	Normal response																
Fast	Fast response	Ø4 mm	Sensor length 35...300 mm														
Fast	Fast response	Ø3 mm	Sensor length 35...300 mm														
<b>Process connection</b>																	
Tube without connection				PN40													
Nipple, male	G1/2A		ISO 228/1	PN100													
Nipple, male	G1/2A hygienic		ISO 228/1	PN40													
Nipple, male	M12 x 1.5 hygienic		ISO 228/1	PN40													
Nipple, male	M12 x 1.5 hygienic		ISO 228/1	PEEK cone Ø3 x 5 mm tip	PN40												
G½" union nut	Conical sensor			Ø3 x 20 mm or 25 mm sensor tip	PN40												
Nipple, male	G1/4A		DIN 3852-E	PN100													
DN25/DN38 clamp, 3-A	(1", 1½")		ISO 2852	PN40													
Triclamp® ½", ¾"	(DN15/DN20)			PN40													
3A/DN38, BHC	Hygienic connection			PN40													
NPT	½-14			PN100													
NPT	¾-18			PN100													
Nipple, male	G1/2A		DIN 3852-E	PN100													
<b>Sensor element</b>																	
1 x Pt100 Cl. B																	
2 x Pt100 Cl. B	For 6 mm standard tip only																
1 x Pt100 Cl. 1/3 B																	
2 x Pt100 Cl. 1/3 B	For 6 mm standard tip only																
1 x Pt100 Cl. 1/6 B																	
1 x Pt100 Cl. A																	
2 x Pt100 Cl. A	For 6 mm standard tip only																
<b>Cooling neck</b>																	
None																	
Cooling neck	See table page 1																
<b>Electrical connection</b>																	
M12 plug, 4 pole																	
M12 plug, 4 pole, Iout pin 2			with 4...20 mA transmitter	1 x Pt100 only													
M12 plug, 4 pole, Iout pin 2, 3			with 4...20 mA transmitter	1 x Pt100 only													
DIN 43650-A																	
DIN 43650-A			with 4...20 mA transmitter	1 x Pt100 only													
<b>Certificates</b>																	
Not specified																	
Ex ia Simple apparatus, gas and dust																	
<b>Sensor tube length</b>																	
5 mm for connection code 6																	0005
20 mm for connection code 7																	0020
25 mm for connection code 7																	0025
Length in mm (e.g. 60 mm = 0060)																	xxxx
<b>Configuration</b>																	
No configuration																	
Configuration of range																	

EN2017-03-14 Design and specifications subject to change without notice