Temperature Sensor TE2
Compact RTD temperature sensors

Baumer
Passion for Sensors

Main features

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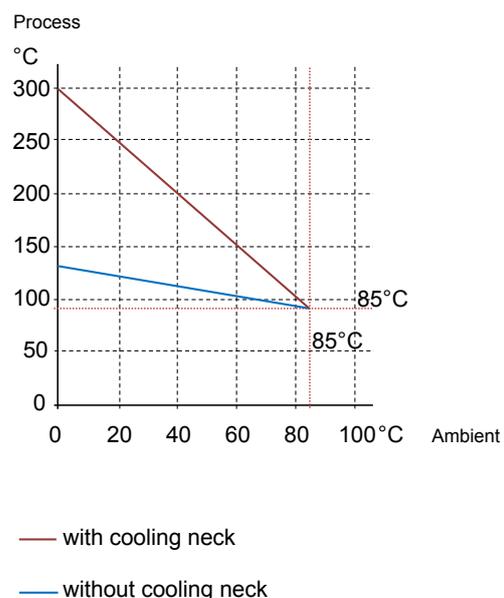- Programmable by FlexProgrammer 9701

Applications

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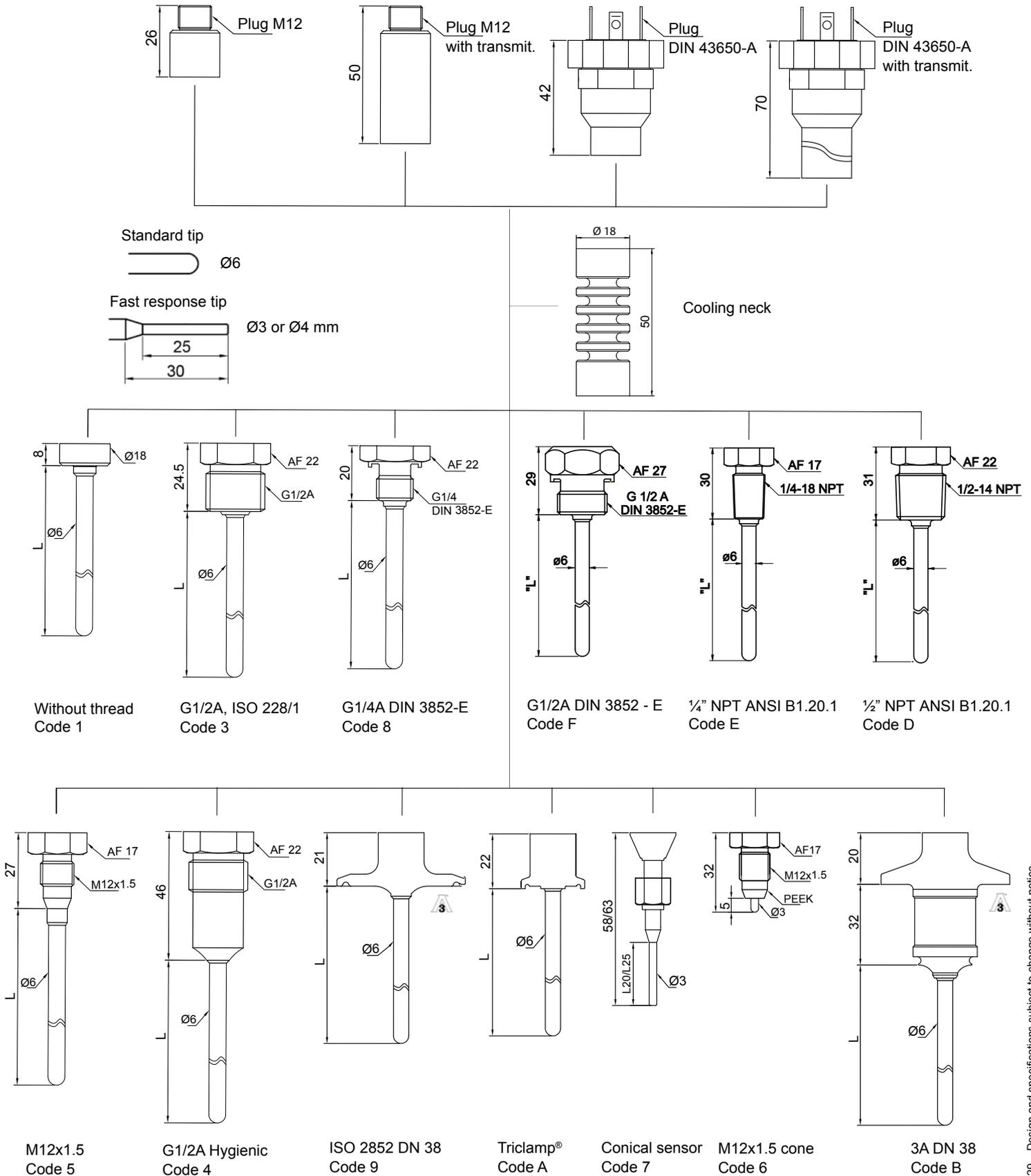- Energy
- Transportation & Logistics
- Railway

IP 67   FDA   CIP   SIP

EN 50155

Technical specificatio

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 Fast response tip	Ø 6 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	$\pm (0.3 + 0.005 \times t)$ °C
Pt100 1/3 DIN class B	$\pm 1/3 \times (0.3 + 0.005 \times t)$ °C
Pt100 1/6 DIN class B	$\pm 1/6 \times (0.3 + 0.005 \times t)$ °C
Pt100 DIN class A	$\pm (0.15 + 0.002 \times t)$ °C
Single element	$1 \times$ Pt100
Double element	$2 \times$ 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

Process °C

300 / 250 / 200 / 150 / 100 / 85°C / 85°C / 50 / 0

0   20   40   60   80   100 °C   Ambient

— with cooling neck

— without cooling neck

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Dimensions (mm) and constructions details

26 — Plug M12

50 — Plug M12 with transmit.

42 — Plug DIN 43650-A

70 — Plug DIN 43650-A with transmit.

Standard tip — Ø6

Fast response tip — Ø3 or Ø4 mm
25
30

Ø 18
50 — Cooling neck

8 — Ø18
Ø6
L

Without thread
Code 1

24.5 — AF 22 — G1/2A
Ø6
L

G1/2A, ISO 228/1
Code 3

20 — AF 22 — G1/4 DIN 3852-E
Ø6
L

G1/4A DIN 3852-E
Code 8

29 — AF 27 — G 1/2 A DIN 3852-E
ø6
"L"

G1/2A DIN 3852 - E
Code F

30 — AF 17 — 1/4-18 NPT
ø6
"L"

¼" NPT ANSI B1.20.1
Code E

31 — AF 22 — 1/2-14 NPT
ø6
"L"

½" NPT ANSI B1.20.1
Code D

27 — AF 17 — M12x1.5
Ø6
L

M12x1.5
Code 5

46 — AF 22 — G1/2A
Ø6
L

G1/2A Hygienic
Code 4

21
Ø6
L

ISO 2852 DN 38
Code 9

22
Ø6
L

Triclamp®
Code A

58/63
L20/L25 — Ø3

Conical sensor
Code 7

32 — AF17 — M12x1.5
5 — PEEK — Ø3

M12x1.5 cone
Code 6

20
32
Ø6
L

3A DN 38
Code B

Electrical connections

Plug DIN 43650-A

Connection 4

Connection 5

M12 Plug

Connection 1

Connection 2

Connection A
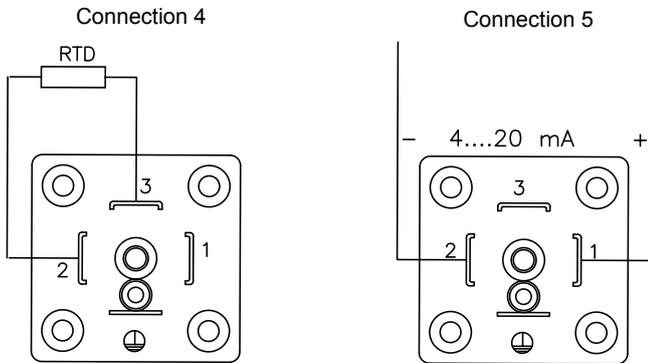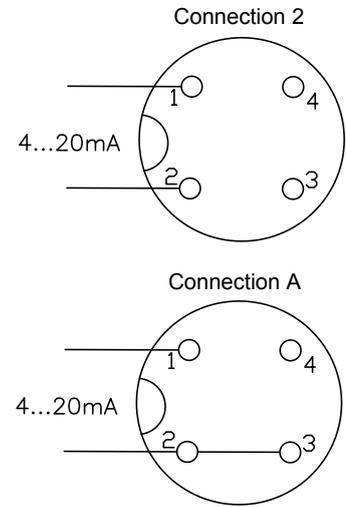
M12, 4 pin connector colours

1. Brown
2. White
3. Blue
4. Black

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
Surpression	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 Vrms
Load equation	RL ≤ (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

		TE2	_	x	.	x	.	x	x	x	x	.	xxxx	.	x

Model

Compact temperature sensor		TE2	

Sensor tip

Not specifie	For connection code 6 & 7			0
Standard	Normal response			1
Fast	Fast response	Ø4 mm	Sensor length 35...300 mm	2
Fast	Fast response	Ø3 mm	Sensor length 35...300 mm	3

Process connection

Tube without connection				PN40	1
Nipple, male	G1/2A	ISO 228/1		PN100	3
Nipple, male	G1/2A hygienic	ISO 228/1		PN40	4
Nipple, male	M12 x 1.5 hygienic	ISO 228/1		PN40	5
Nipple, male	M12 x 1.5 hygienic	ISO 228/1	PEEK cone Ø3 x 5 mm tip	PN40	6
G⅛" union nut	Conical sensor		Ø3 x 20 mm or 25 mm sensor tip	PN40	7
Nipple, male	G1/4A	DIN 3852-E	with NBR seal	PN100	8
DN25/DN38 clamp, 3-A	(1", 1½")	ISO 2852		PN40	9
Triclamp® ½", ¾"	(DN15/DN20)			PN40	A
3A/DN38, BHC	Hygienic connection			PN40	B
NPT	½-14			PN100	D
NPT	¼-18			PN100	E
Nipple, male	G1/2A	DIN 3852-E	with FKM seal	PN100	F

Sensor element

1 x Pt100 Cl. B		1
2 x Pt100 Cl. B	For 6 mm standard tip only	2
1 x Pt100 Cl. 1/3 B		3
2 x Pt100 Cl. 1/3 B	For 6 mm standard tip only	4
1 x Pt100 Cl. 1/6 B		5
1 x Pt100 Cl. A		7
2 x Pt100 Cl. A	For 6 mm standard tip only	8

Cooling neck

None		0
Cooling neck	See table page 1	4

Electrical connection

M12 plug, 4 pole			1
M12 plug, 4 pole, Iout pin 2	with 4...20 mA transmitter	1 x Pt100 only	2
M12 plug, 4 pole, Iout pin 2, 3	with 4...20 mA transmitter	1 x Pt100 only	A
DIN 43650-A			4
DIN 43650-A	with 4...20 mA transmitter	1 x Pt100 only	5

Certificates

Not specified	0
Railway EN 50155	4
Ex ia Simple apparatus, gas and dust	9

Sensor tube length

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

Configuration

No configuration	0
Configuration of range	C