

Resistance thermometer Pt100

with screw-in thermowell or with flange connection

Type series GA251.



SIL2

Application area

- Chemical and petrochemical industry
- Plant and mechanical engineering
- General process technology

Features

- Pt100 connection in 3- or 4-wire technology
- Measuring insert 1 x Pt100 or 2 x Pt100
- Measuring insert interchangeable
- Process connection
 - for screw-in
 - with flange connection
- Various thermowell designs available

Options

- Approvals / Certificates
 - Explosion protection
 - Classification per SIL2
 - Material certificate per EN 10204-3.1
- As per UKCA regulations
- Various transmitters can be integrated
- Measuring insert for In-Process calibration

Application

The resistance thermometer is suited for operation on tanks and pipes. All standard types of process connections are available. The change in resistance, dependent on the measurement temperature, can be detected by a transmitter and converted into a standardized signal. A variety of transmitters for head mounting is available for different applications.

For In-Process calibration the integration of a special measuring insert with additional test pipe is possible (data sheet T4-025-45, Type GA3100, reference sensor: data sheet T4-025-46, Type GA3110).

Technical data

Constructional design

Design: Measuring insert (interchangeable) with connection head and thermowell

Connection head:

- Model B
cap with slotted screws,
material: aluminium,
degree of protection IP 54
- Model BUZH
high spring cover with slotted screw,
material: aluminium,
degree of protection IP 65
- Field housing Ø 60 mm
screw cap,
material:
stainless mat.-no. 1.4305 (303),
degree of protection IP 67

Further connection heads upon request

Dimension:

- Pipe-ø 9 x 1 mm
material: stainless steel mat.-no.
1.4305 (316L)
- Pipe-ø 11 x 2 mm
material: stainless steel mat.-no.
1.4571 (316Ti)

Lengths see order details

Surface:

Surface roughness standard:
 $R_a \leq 1.5 \mu\text{m}$

Surface roughness hygienic:
 $R_a \leq 0.8 \mu\text{m}$

Welding:
 $R_a < 1.5 \mu\text{m}$

Optional:
Certification of material testing per EN 10204

Upon request a calculation for thermowells can be made
(for static or dynamic application) with certificate.

Measuring system

Measuring in-
sert: Per DIN 43735, interchangeable,
Ø 6 mm, rigid or as sheathed element
Material stainless steel

Measuring re-
sistor: Pt100 per EN 60751,
3- or 4-wire technology
(see order details)

Optional :
Measuring insert with connection socket per DIN 43735
and with additional test pipe for In-Process calibration
(see data sheet DB_T4-025-45)

Material: stainless steel mat.-no. 1.4571 (316 Ti)

Process connection

Design: For screw-in:

- G 1/2 B, G 3/4 B
- G 1 B
- M20 x 1,5
- 1/2" NPT, 3/4" NPT

With flange connection:

- DN50 PN 10/40 model B1 (EN 1092-1)
- DN25 PN 10/40 model B1 (EN 1092-1)

Further process connections upon request.
Material: stainless steel mat. no. 1.4571
(316Ti)

Accuracy

Accuracy: Class A per EN 60751
For In-Process measuring insert:
class A in the range -50...300 °C,
above this class B

Indication

Design: Programmable LED-on-site indication
for stainless steel field housing (Ø 60
mm),
(see data sheet DB_M6-031)

Temperature ranges

See order details

Transmitter

Integration: Suitable Pt100 transmitter can be inte-
grated into the connection head

Options:

- Instead of terminal block
- Mounting in the spring cover of the
connection head BUZH

For further suitable analog and digital
transmitters see product group T4.

Tests and certificates

SIL2: Functional safety per EN 61508, classification per SIL2.
For detailed information see SIL instruction SA_005.

Ex approval standard measuring insert:

ATEX: BVS 04 ATEX E 144 X
Ⓔ II 2G EEx ia IIC T4/T6
 $U_i \leq 30 \text{ V}$
 $P_i \leq 200 \text{ mW}$
Further technical information see Ex Instruction XA_002.

UK: Intrinsically safe per EN 60079-11, P5.7 simple electrical apparatus.
Further technical information see Ex Instruction XA_030.

Ex approval measuring insert In-Process calibration:

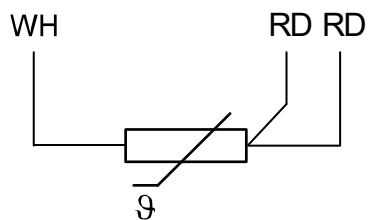
ATEX: IBExU 13 ATEX 1017 X
Ⓔ II 2G Ex ia IIC T6...T1 Gb
 $U_i \leq 30 \text{ V}$
 $P_i \leq 750 \text{ mW}$
 $L_i \text{ max. } 10 \text{ }\mu\text{H/m}$
 $C_i \text{ max. } 500 \text{ pF/m}$
Further technical information see Ex Instruction XA_003.

UK: Intrinsically safe per EN 60079-11, P5.7 simple electrical apparatus.
Further technical information see Ex Instruction XA_003.

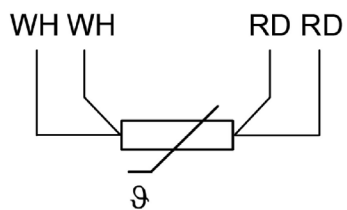
Connection diagram

Connection head

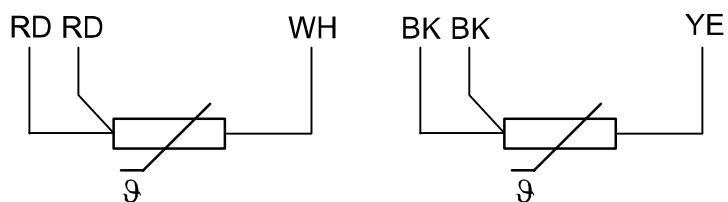
Pt100 3-wire



Pt100 4-wire

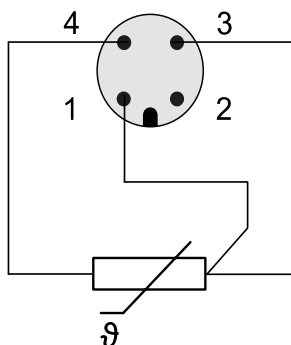


2 x Pt100 3-wire

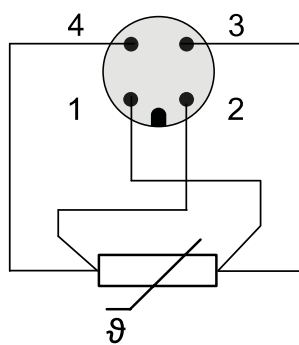


Circular connector M12

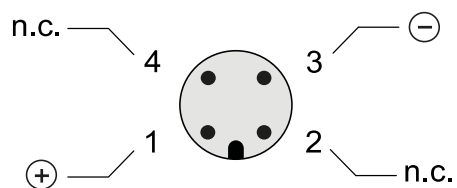
1 x Pt100 3-wire



1 x Pt100 4-wire



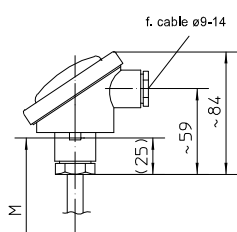
Transmitter



Dimensions

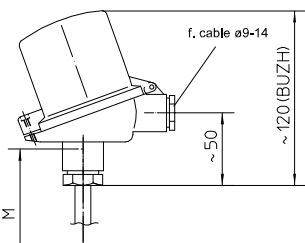
connection heads

model B, cap with
2 slotted screws
mat. aluminium, IP 54



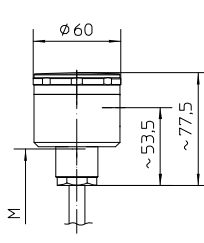
up to sealing surface

model BUZH, high spring cover
with slotted screw,
mat. aluminium, IP 65



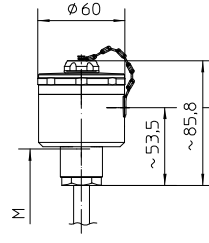
up to sealing surface

connection head field housing,
screw cap,
mat. stainless steel, IP 67

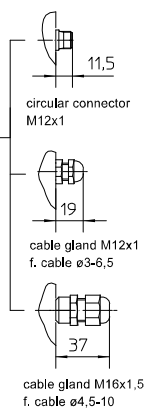


up to sealing surface

connection head field housing,
screw cap with opening,
mat. stainless steel, IP 67



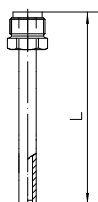
up to sealing surface



thermowell models

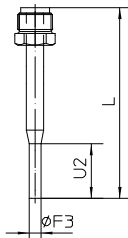
thermowell according to DIN 43772:

insertion/
welding



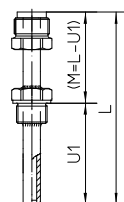
model 2

insertion/
welding



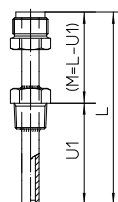
similar model 3
with reduced tip

screw-in



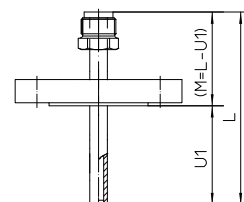
model 2 G/3 G
parallel thread
G1/2B
G3/4B
G1B
M20x1,5

screw-in



model 2 G/3 G
conical thread
1/2"NPT
3/4"NPT

flanged



model 2 F/3F

Remark: Neck tube M > 60 mm

Order details

Resistance Thermometer Pt100 with screw-in thermowell or with flange connection					
GA251 .	design	with thermowell			
0	ex-protection	without			
1		explosion protection, type of ex-protection s. below			
A01	process connection	without, for insertion or for welding			
A10 .		G1/2 B			
A11 .		G3/4 B			
A12 .		G1 B			
A13 .		M 20 x 1,5			
A15 .		1/2" NPT			
A16 .		3/4" NPT			
A21 .		flange DN25 PN 10/40 model B1 (DIN EN 1092-1)			
A22 .	flange DN50 PN 10/40 model B1 (DIN EN 1092-1)				
1	material process conn.	stainless steel mat.-no. 1.4571 (316Ti)			
9		varying			
	thermowell length total L	length L		meas. insert l _s	
B10		95 mm		105 mm	
B13		115 mm		125 mm	
B16		130 mm		140 mm	
B19		180 mm		190 mm	
B22		195 mm		205 mm	
B28		245 mm		255 mm	
B31		265 mm		275 mm	
B37		305 mm		315 mm	
B40		365 mm		375 mm	
B43		395 mm		405 mm	
B46		425 mm		435 mm	
B49		515 mm		525 mm	
B52		545 mm		555 mm	
B99		varying			
C12		thermowell Ø and model	F ₁ = 9 mm, thermowell 9/7, model 2 per DIN, standard		
C13			F ₁ = 11 mm, thermowell 11/7, model 2 per DIN		
C16	9/7, reduced tip F3 = Ø 5x20 mm, ID 3.5 mm				
C17	12, reduced tip F3 = Ø 9x40 mm, ID 7 mm				
C99	as in writing				
1	thermowell material	stainless steel mat.-no. 1.4571 (316Ti)			
9		varying			
. . .	immersion length U1 ¹	length in mm (e.g. 160 for 160 mm), U _{max} = L - 60 mm			
9999		varying, as in writing			
	measuring insert as per DIN 43735 (class A)	diameter, design, material	meas. element	operating range	test pipe
D2-M22		6 mm, st. steel, standard	thin film	-50...400 °C	--
D6-M21		6 mm, sheathed element, st. steel	ceramic	-200...600 °C	--
D22-M24		6 mm, rigid, st. steel (In-Process)		-50...400 °C ²	28 mm ³
N2	sensor type	1 x Pt100 in 3-wire technology			
N3		1 x Pt100 in 4-wire technology			
N5		2 x Pt100 in 3-wire technology			
T11	connection head	model B	electrical connection cable gland M20x1.5		
T15		model BUZH	nickel plated brass, cable Ø 9-14		
T47		field housing	cable gland	polyamide black	cable Ø 3-6.5
T47.40				st. steel	cable Ø 4.5-10
T47.21			with circular connector M12x1		
T47.51		field housing with additional opening for refer- ence sensor	cable gland	polyamide black	cable Ø 3-6.5
T49					st. steel
T49.40				cable Ø 3-6.5	
T49.21					

Additional features (to be indicated in case of need, only)		
S52	Intrinsically safe per EN 60079-11, P5.7 simple electrical apparatus (UK; standard measuring insert)	
S53	Intrinsically safe per EN 60079-11, P5.7 simple electrical apparatus (UK; Measuring insert In-Process calibration)	
S68	type of ex-protection	 II 2G Ex ia IIC T4/T6 ⁴ , BVS 04 ATEX E 144 X (standard measuring insert)
S75		 II 2G Ex ia IIC T6-T1 Gb, IBExU 13 ATEX 1017 X (In-Process calibration)
Z1	incl. transmitter (pls specify separately)	mounting on the measuring insert (instead of terminal block)
Z2		mounting in the spring cover of the connection head BUZH
W1020	material certificate per EN 10204-3.1	
W2604	functional safety per EN 61508, classification per SIL2	
W2660	as per UKCA regulations ⁵	
W1204	calibration certificate per EN 10204-3.1 (3 meas. points)	

Order code (example): GA2510 - A101 - B37 - C121160 - D2 - M22 - N2 - T47

¹ Not possible with process connection A01 (insertion/welding).

² Up to 300 °C accuracy class A, above this class B.

³ For In-Process calibration only.

⁴ Only with sheathed element.

⁵ Not possible with inline diaphragm seal or connection to inline unit ASEPconnect with pipe diameter > 25 mm.