

Resistance thermometer Pt100 with interchangeable measuring insert Type series GA254.



Application area

- Pharmaceutical industry
- Food industry
- Biotechnology

Features

- Measuring resistor 1 x Pt100 in 3- or 4-wire technology
- Measuring insert of stainless steel
- Measuring insert interchangeable (spring-loaded)
- DIN 11864-1, VARIVENT®, DIN 11851 and Clamp per DIN 32676 / ISO 2852 with EHEDG certificate
- Process connections for hygienic applications
- Hygienic design, constructive design according to the EHEDG recommendations
- Available with reduced tip (fast response)

Options

- Approvals / Certificates
 - Explosion protection
 - Classification per SIL2
- 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 pipings especially in hygienic applications. All standard types of process connections are available. Because of its robust design it is suitable for use in a great number of technological processes. The change in resistance, dependant 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 (see data sheet DB_T4-025-45, Type GA3100, reference sensor: see data sheet DB_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

Thermowell

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 insert:	Per DIN 43735, interchangeable, Ø 6 mm, rigid or as sheathed element Material stainless steel
Measuring resistor:	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:	■ Aseptic connection DIN 11864-1 ■ Tapered coupling with groove union nut per DIN 11851 ■ Clamp connection per DIN 32676 ■ Clamp connection per ISO 2852 ■ Tri-Clamp ■ VARIVENT® connection ■ NEUMO BioControl ■ Ingold connection including gasket EPDM ■ Thermowell with welding ball ■ Threated connection, metal-to-metal joint
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Further process connections upon request.

Material of process connection: stainless
steel mat. no. 1.4404 (316L). Gasket is not
included (except for Ingold)

Accuracy

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

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

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.

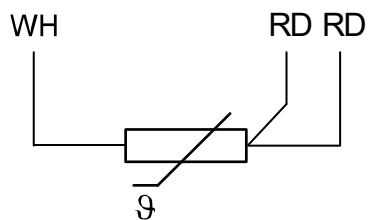
Ex approval measuring insert In-Process calibration:

ATEX:	IBExU 13 ATEX 1017 X Ⓔ II 2G Ex ia IIC T6...T1 Gb $U_i \leq 30 \text{ V}$ $P_i \leq 750 \text{ mW}$ $L_i \text{ max. } 10 \mu\text{H/m}$ $C_i \text{ max. } 500 \text{ pF/m}$ 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.
SIL2:	Functional safety per EN 61508, classification per SIL2. For detailed information see SIL instruction SA_005.

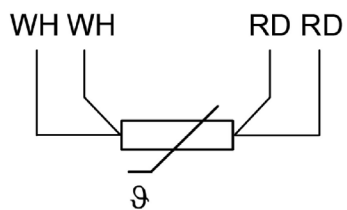
Connection diagram

Connection head

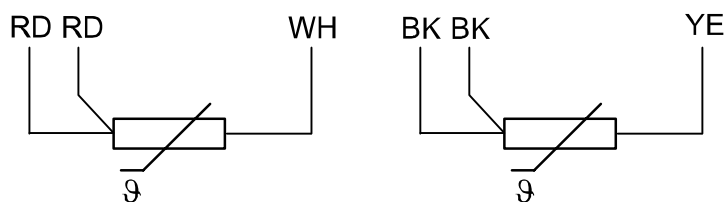
Pt100 3-wire



Pt100 4-wire

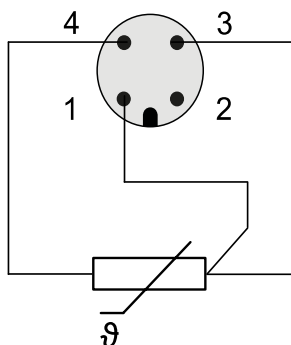


2 x Pt100 3-wire

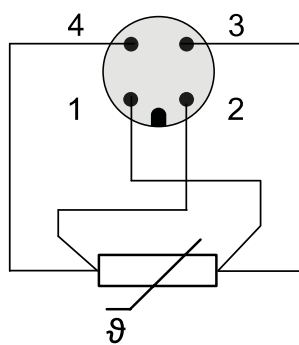


Circular connector M12

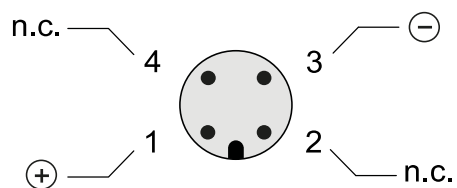
1 x Pt100 3-wire



1 x Pt100 4-wire



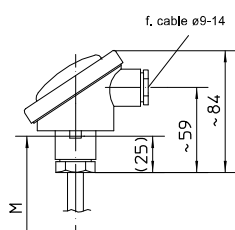
Transmitter



Dimensions

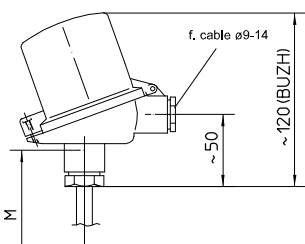
connection heads

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



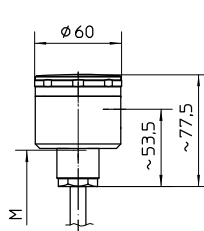
up to sealing surface

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



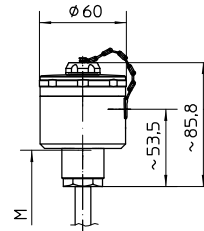
up to sealing surface

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

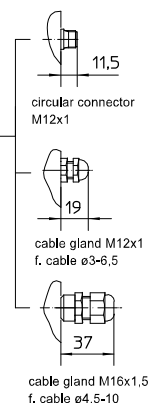


up to sealing surface

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

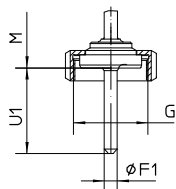


up to sealing surface

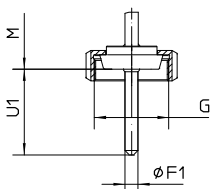


process connections

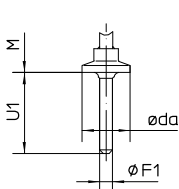
tapered coupling with
groove union nut
aseptic design per DIN 11864-1



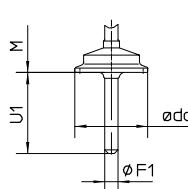
tapered coupling with
groove union nut
per DIN 11851



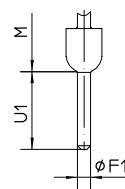
Tri-clamp connection



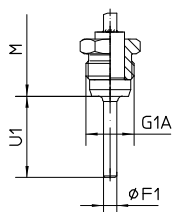
clamp connection
per DIN 32676
or ISO 2852



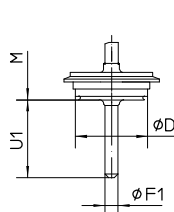
thermowell with
welding ball 30x40 mm



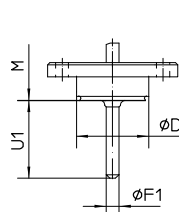
G1A dead-zone free
(conical taper af metall)



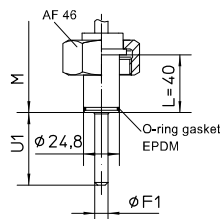
Varivent connection



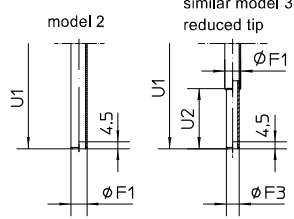
NEUMO BioControl



connection per INGOLD
DN 25 with coupling nut



neck tube according to DIN 43772



Order details

Resistance thermometer Pt100 with interchangeable measuring insert					
GA254 .	Resistance thermometer Pt100 with interchangeable measuring insert				
0	Ex-protection	without			
1		Ex-protection, type of Ex-protection see below			
-	surface roughness	standard			
HY		according to hygienic design			
A121066	process connection (further process connections upon request)	tapered coupling with groove union nut DIN 11851 ^{1,2}	DN 25	Ø 26 mm	
A121068			DN 32	Ø 35 mm	
A121070			DN 40	Ø 41 mm	
A121072			DN 50	Ø 53 mm	
A141066		clamp DIN 32676 ^{1,2}	DN 25	Ø 50.5 mm	
A141070			DN 40	Ø 50.5 mm	
A141072			DN 50	Ø 64 mm	
A145083		clamp ISO 2852 ^{1,2}	DN 25 (1")	Ø 50.5 mm	
A145084			DN 38 (1 1/2")	Ø 50.5 mm	
A145085			DN 51 (2")	Ø 64 mm	
A145086			DN 63.5 (2 1/2")	Ø 77.5 mm	
A147083		Tri-Clamp	DN 1"	Ø 50.5 mm	
A147084			DN 1 1/2"	Ø 50.5 mm	
A151060		VARIVENT®-connection ^{1,2}	Form F (D=50) for VARINLINE® access unit		
A151061			Form N (D=68) for VARINLINE® access unit		
A161066		BioControl (NEUMO)	Gr. 25	Ø 30.5 mm	
A161072			Gr. 50	Ø 50 mm	
A161073			Gr. 65	Ø 68 mm	
A181010		process connection per In-gold	hexagon union nut A/F 46, G 1 1/4", L=40 mm		
A191010		thermowell with welding ball	30 x 40 mm		
B121166		aseptic connection DIN 11864-1, collar connection with coupling nut, model A (further variants upon request) ^{1,2}	for pipes per DIN 11850	DN 25	RD 52x1.6
B121168				DN 32	RD 58x1.6
B121170				DN 40	RD 65x1.6
B121172				DN 50	RD 78x1.6
B121266			for pipes ISO 1127 per DIN 2463	DN 26,9	RD 52x1.6
B121268				DN 33,7	RD 58x1.6
B121270				DN 42,4	RD 65x1.6
B121272				DN 48,3	RD 78x1.6
A101015		threaded connection	G1A conical, metal-to-metal joint		
A9999		custom-made			
C122	thermowell Ø	F1 = 9 mm, thermowell 9/7, material stainless steel mat.-no. 1.4404 (316L)			
C131		F1 = 11 mm, thermowell 11/7, material stainless steel mat.-no. 1.4571 (316Ti)			
C162		9/7, reduced design, tip F3 = Ø 5x20 mm, ID 3.5 mm, mat. stainless steel mat.-no.1.4404 (316L)			
C99		as in writing			
1	neck tube	M = 80 mm			
2		M = 145 mm			
9		as in writing			
	immersion length	immersion length U1	length meas. insert I5		
			neck tube = 80 mm	neck tube M = 145 mm	
035		35 mm	125 mm	190 mm	
050		50 mm	140 mm	205 mm	
100		100 mm	190 mm	255 mm	
160		160 mm	250 mm	315 mm	
250		250 mm	340 mm	405 mm	
400		400 mm	490 mm	555 mm	
999	custom-made				

		diameter, design, material	measuring instrument	temperature range	test pipe
D2-M22	measuring insert, as per DIN 43735 (class A)	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 ³	28 mm ⁴
N2	sensor type	1 x Pt100 in 3-wire technology, standard			
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					cable Ø 4,5-10
T47.21			with circular connector M12x1	stainless steel	cable Ø 3-6,5
T47.51					
T49		field housing with additional opening for reference sensor	cable gland	polyamid black	cable Ø 3-6,5
T49.40					cable Ø 4,5-10
T49.21			stainless steel		cable Ø 3-6,5

Additional features (to be indicated if required)		
S52	type of ex-protection	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		Ex II 2G Ex ia IIC T4/T6 ⁵ , BVS 04 ATEX E 144 X (standard measuring insert)
S75		Ex 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
W2604	functional safety per EN 61508, classification per SIL2	
W2660	as per UKCA regulations ⁶	
W4035	process connection electropolished	
W1204	transmitter with resistance thermometer calibrated, incl. calibration certificate 3 meas. points	

Order code (example): GA2540 - A121066 - C1311100 - D2-M22 - N2 - T47 - ...

¹ EHEDG certified only in connection with hygienic design (order code option HY)

² EHEDG certificate valid only if gaskets are used that are listed in the "EHEDG position paper"

³ up to 300 °C accuracy class A, above this class B

⁴ for In-process calibration (no classification in SIL2)

⁵ for devices with Ex protection only with sheathed element

⁶ not possible with inline diaphragm seal or connection to inline unit ASEPTconnect with pipe diameter > 25 mm