Resistance thermometer Clamp-on technology

for temperature measurement on pipes

Type series GA261.

Features

- Patented measuring system for hygienic temperature measurement without contact to media, for pipe diameter 4…300 mm
- Measuring insert can be recalibrated and is replaceable; the installation arrangements are unchanged
- High accuracy, fast response
- Quick and cost efficient installation, (also for subsequent installation)
- No additional isolation required
- Measuring resistor 1 x Pt100 or 2 x Pt100, class A
- Temperature range -40 °C up to 150 °C (further temperature ranges upon request)

Options

- Approvals/Certificates
  - Explosion protection
  - Classification per SIL2
  - Calibration certificate per EN 10204-3.1
- As per UKCA regulations
- Output signal 4...20 mA via transmitter PA2430
- Output signal IO-Link V1.1 via transmitter PA2530
- Various transmitters can be integrated
- Further temperature transmitters see www.labom.com

Application area

- Pharmaceutical industry
- Food industry
- Biotechnology

Application

The resistance thermometer in clamp-on technology is used for temperature sensing and process control, mainly for sterile applications in the food and pharmaceutical industries. The resistance thermometer can be quickly and easily fitted to all existing pipework. There are no changes necessary to the piping and no welding required. The resistance thermometer can be supplied with a built-in transmitter.

For applications that require a high-resolution graphic display with intuitive operation and comprehensive parameterising functions, we recommend our temperature transmitter GV4610.

Constructional design

The whole system exists of a measuring insert, an electrical connection and a clamping element. The replaceable measuring insert is pressed against the pipe surface being measured by a pre-defined spring force. Because the insert is held permanently in the same installation position, all measurements taken are reproducible.

Technical data

Constructional design

Electrical connection:	Circular connector M12 (4 pin) Options: Circular connector M12 (8 pin) for 2 x Pt100 Field housing Ø 60 mm with screw cap, rotatable, positionable through ± 170° Material: stainless steel mat.-no. 1.4305 (303) With cable glands: ■ M12 x 1.5 PA black ■ M12 x 1.5 stainless steel ■ M16 x 1.5 PA black
Weight:	With circular connector M12: ■ pipe-Ø ≤ 17.2 mm: approx. 100 g ■ pipe-Ø ≥ 18.0 mm: approx. 200 g With field housing: approx. 400 g With transmitter integrated in the circular connector M12: ■ pipe-Ø ≤ 17.2 mm: approx. 130 g ■ pipe-Ø ≥ 18.0 mm: approx. 230 g
Type plate:	Adhesive label

Measuring insert

Design:	Special measuring insert: Ø 6 mm; hygienic design. Measuring insert screwed into the clamping element under spring tension.
Material:	Stainless steel Measuring element from silver, thermally isolated via PEEK element.
Measuring resistor:	■ Pt100 per EN 60751, class A 4-wire (also connectable in 3-wire) ■ Pt100 per EN 60751, class A 4-wire (3-wire bridged) ■ Pt100 per EN 60751, class A 3-wire ■ 2 x Pt100 per EN 60751, class A 3-wire
Degree of protection per EN 60529:	IP 67

Process connection

Design:	Clamping element designed for installation with : ■ clamping block for pipes Ø 4...57 mm ■ clamping shoe for pipes Ø 10...300 mm
Material:	Temperature resistant plastics (PVDF) with integrated isolation system, hygienic design
Degree of protection per EN 60529:	IP 65
Pipe diameter:	See order code

Accuracy

The accuracy and response time of the whole system depend on the pipe geometry, the medium and the ambient temperature.

For Pt100 per EN 60751, class A 4-wire:
(also connectable in 3-wire)

Accuracy of system in the range -20 up to 150 °C:

For all nominal ranges: $(T_U - T_M) \times 0.02$ *

For 2 x Pt100 per EN 60751, class A 3-wire:

Accuracy of system in the range -20 up to 150 °C:

For all nominal ranges: $(T_U - T_M) \times 0.035$ *

For Pt100 per EN 60751, class A 3-wire and 4-wire (3-wire bridged):

Accuracy of system in the range -20 up to 150 °C:

For nom. ranges ≥ 18.0 mm: $(T_U - T_M) \times 0.02$ *

For nom. ranges < 18.0 mm: $(T_U - T_M) \times 0.03$ *

T_M = media temperature
T_U = ambient temperature

Repeatability:	typical 0.1 °C, max. 0.2 °C *
Response time:	t_{90} = 8...15 s * (on pipe-Ø 18 x 1.5)

* with use of heat sink compound (see Type MT8800)

Temperature ranges

Ambient:	-20...80 °C
Storage:	-40...80 °C

Transmitter

Installation variants:

- Transmitter, Type PA2430, for circular connector M12
- Transmitter, Type PA2530 IO-Link, for circular connector M12
- Transmitter head mounted, Type series PA210., 4…20 mA, programmable
- Transmitter head mounted, Type series PA220., electrically isolated, classification per SIL2
- Transmitter head mounted, Type series PA230., electrically isolated, classification per SIL2, HART®
- Transmitter head mounted, Type series PA2420, 2 channel, classification per SIL2/3, HART®

Tests and certificates

Ex approval:

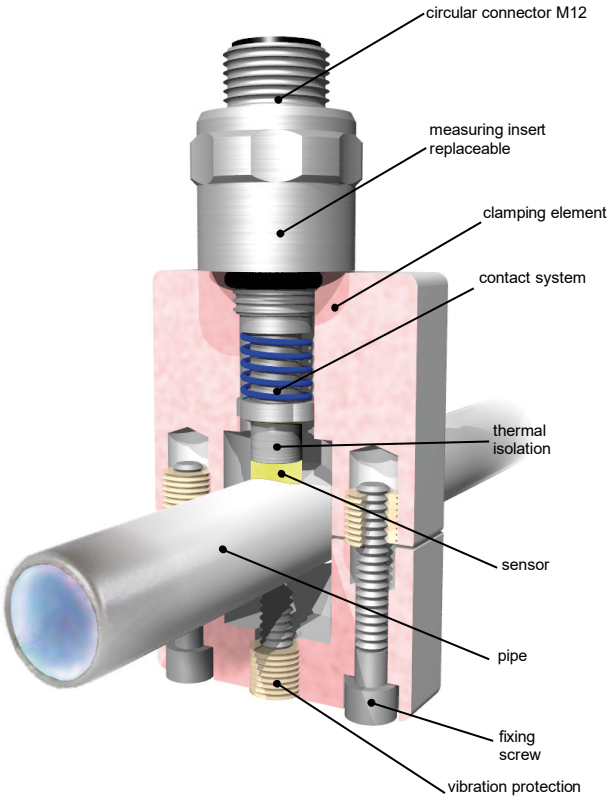
ATEX:	TÜV 08 ATEX 554093 X ⟨Ex⟩ II 1G Ex ia IIC T6/T5/T4 ⟨Ex⟩ II 2G Ex ib IIC T6/T5/T4 ⟨Ex⟩ II 1D Ex iaD 20 T89 °C ⟨Ex⟩ II 2D Ex ibD 21 T129 °C U_i ≤ 30 V P_i ≤ 200 mW C_i und L_i negligible small (not for version with transmitter)
UK:	Intrinsically safe per EN 60079-11, P5.7 simple electrical apparatus

Further technical data see Ex instruction XA_001.

SIL 2:	Functional safety per EN 61508, classification per SIL 2; transmitters have to be considered separately.

Design

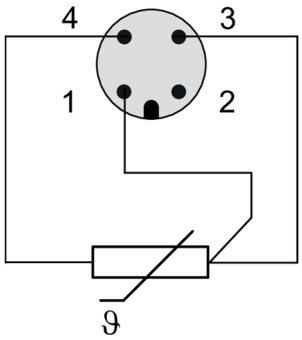
3D presentation



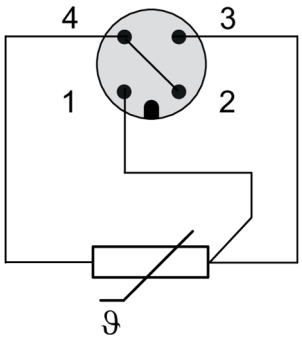
Connection diagram

Circular connector

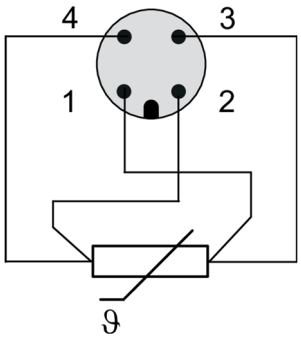
1 x Pt100, 3-wire



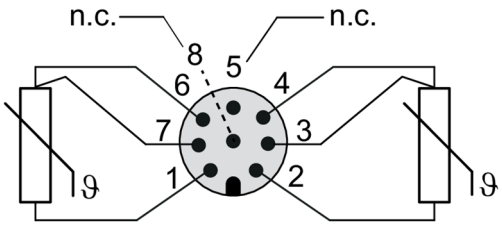
1 x Pt100, 4-wire
(3-wire bridged)



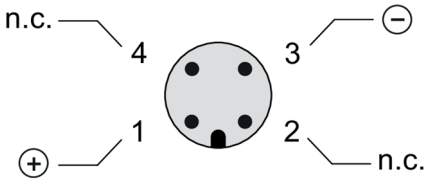
1 x Pt100, 4-wire



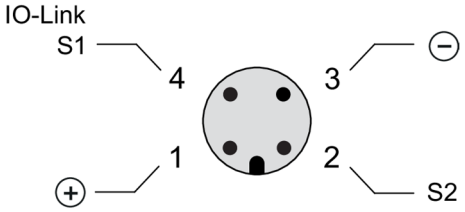
2 x Pt100, 3-wire



Transmitter
(Type series PA2430)

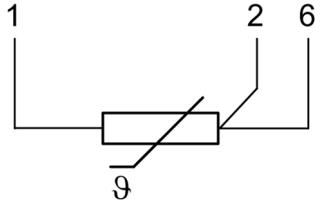


Transmitter IO-Link
(Type series PA2530)

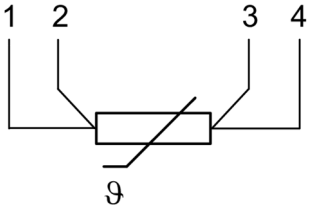


Terminal block / cable gland

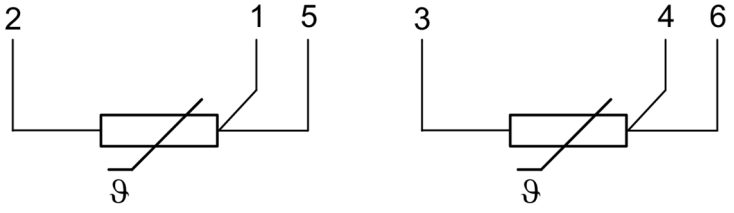
1 x Pt100, 3-wire



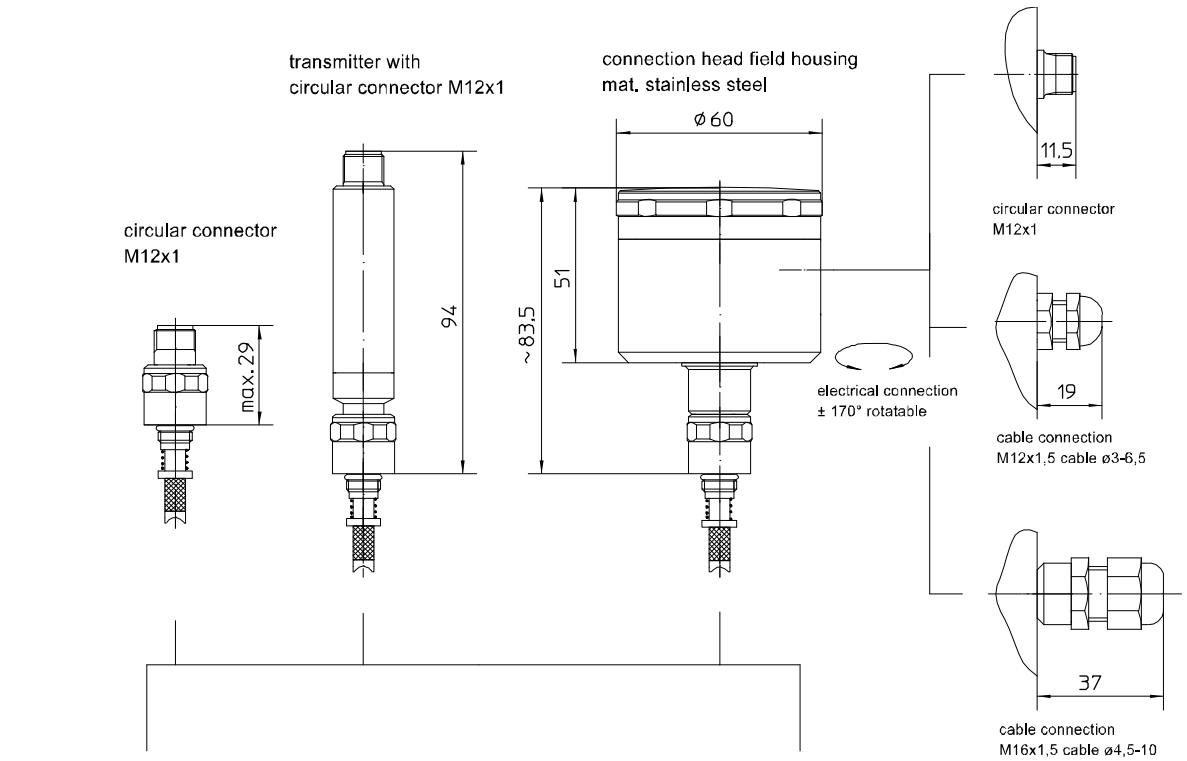
1 x Pt100, 4-wire



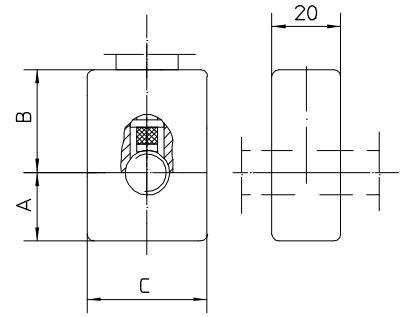
2 x Pt100, 3-wire



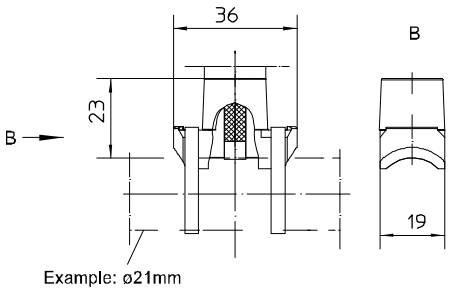
Dimensions



Clamping block
for pipe ø4-57



Clamping shoe
for pipe ≥ ø10 - ~ø300



Order details

Resistance thermometer Clamp-on technology for temperature measurement on pipes, Type series GA2610

Order details GA2610						
GA261.	Resistance thermometer Clamp-on technology for temperature measurement on pipes					
0	design	standard				
1		explosion protection, design see below				
A4 . . .	clamping elements	for clamping block installation (pipe-Ø 4...57 mm)				
B2 . . .		for clamping shoe installation, pipe-Ø 10 mm or bigger, without hose clamp				
B5...		for clamping shoe installation, pipe-Ø 10 mm or bigger, with hose clamp				
			dimension of the clamping elements			
			50 x 35 x 20	70 x 70 x 20	90 x 85 x 20	23 x 36 x 19
			A4 . . .	A4 . . .	A4 . . .	B 2/B5 . . .
040	pipe external diameter (mm)	4.0	x	-	-	-
060		6.0	x	-	-	-
063		6.35	x	-	-	-
080		8.0	x	-	-	-
093		9.35	x	-	-	-
100		10.0	x	-	-	x
102		10.2	x	-	-	x
103		10.3	x	-	-	x
120		12.0	x	-	-	x
127		12.7	x	-	-	x
130		13.0	x	-	-	x
135		13.5	x	-	-	x
137		13.7	x	-	-	x
140		14.0	x	-	-	x
158		15.88	x	-	-	x
160		16.0	x	-	-	x
172		17.2	x	-	-	x
997		different Ø 4.0-17.9	x	-	-	-
180		18.0	-	x	-	x
190		19.0	-	x	-	x
195		19.05	-	x	-	x
200		20.0	-	x	-	x
213		21.3	-	x	-	x
220		22.0	-	x	-	x
230		23.0	-	x	-	x
240		24.0	-	x	-	x
250		25.0	-	x	-	x
254		25.4	-	x	-	x
267		26.7	-	x	-	x
269		26.9	-	x	-	x
280		28.0	-	x	-	x
290		29.0	-	x	-	x
300		30.0	-	x	-	x
318		31.8	-	x	-	x
320		32.0	-	x	-	x
334		33.4	-	x	-	x
337		33.7	-	x	-	x
340		34.0	-	x	-	x
350		35.0	-	x	-	x
360		36.0	-	x	-	x

			dimension of the clamping elements			
			50 x 35 x 20	70 x 70 x 20	90 x 85 x 20	23 x 36 x 19
			A4 . . .	A4 . . .	A4 . . .	B2/B5 . . .
998	pipe external diameter (mm)	different Ø 18.0-37.5	-	x	-	-
380		38.0	-	-	x	-
381		38.1	-	-	x	x
410		41.0	-	-	x	x
424		42.4	-	-	x	x
445		44.5	-	-	x	x
483		48.3	-	-	x	x
508		50.8	-	-	x	x
530		53.0	-	-	x	x
540		54.0	-	-	x	x
570		57.0	-	-	x	x
999		different Ø > 37.5 - 57.0	-	-	x	-
991		different Ø 10.0 - 300	-	-	-	x
M23	process temperature	-40...150 °C (material PVDF)				
M99		as in writing				
N21	measuring resistor	1 x Pt100 per EN 60751 class A 3-wire				
N31		1 x Pt100 per EN 60751 class A 4-wire (3-wire bridged)				
N32		1 x Pt100 per EN 60751 class A 4-wire [1]				
N5		2 x Pt100 per EN 60751 class A 3-wire [1]				
T150	electrical connection	circular connector M12, IP 67 (4 pin)				
T151		circular connector M12, IP 67 (8 pin) [2]				
T47		field housing, Ø 60 mm, rotatable	cable gland	M12 x 1.5, PA for cable Ø 3-6.5		
T47.21				M12 x 1.5 stainless steel for cable Ø 3-6.5		
T47.40				M16 x 1.5 PA for cable Ø 4.5-10		
T47.51			with circular connector M12 (4 pin)			
T47.52			with circular connector M12 (8 pin) [2]			

additional features (to be indicated in case of need, only)		
S71	Ex marking	Ⓔx II 1G Ex ia IIC T6 /T5/T4
S72		Ⓔx II 2G Ex ib IIC T6 /T5/T4
S73		Ⓔx II 1D Ex iaD 20 T89 °C
S74		Ⓔx II 2D Ex ibD 21 T129 °C
S52		Intrinsically safe per EN 60079-11, P5.7 simple electrical apparatus (UK)
Z1	incl. transmitter	for head mounting on the measuring insert (instead of terminal block) [3]
Z52		integrated in the circular connector M12, Type PA2430 [1, 3, 4, 5]
Z54		integrated in the circular connector M12, Type PA2530 IO-Link [1, 3, 4, 5]
W2604	functional safety per EN 61508, classification per SIL2	
W2660	as per UKCA regulations	

Order code (example): GA2610 - A4060 - M23 - N32 - T47

[1] not with ex-protection
[2] required for version with 2 x Pt100 measuring resistor (order code N5)
[3] selection of transmitters see www.labom.com
[4] not for devices with classification per SIL2
[5] not possible with circular connector M12x1, 8-pin (order code T151)