

## Resistance thermometer Clamp-on technology

for temperature measurement on pipes

Type series GA261.



### Application area

- Pharmaceutical industry
- Food industry
- Biotechnology

### 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
- 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](http://www.labom.com)

### 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. 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: <ul style="list-style-type: none"><li>■ M12 x 1.5 PA black</li><li>■ M12 x 1.5 stainless steel</li><li>■ M16 x 1.5 PA black</li></ul>
Weight:	With circular connector M12: <ul style="list-style-type: none"><li>■ pipe-Ø ≤ 17.2 mm: approx. 100 g</li><li>■ pipe-Ø ≥ 18.0 mm: approx. 200 g</li></ul> With field housing: approx. 400 g With transmitter integrated in the circular connector M12: <ul style="list-style-type: none"><li>■ pipe-Ø ≤ 17.2 mm: approx. 130 g</li><li>■ pipe-Ø ≥ 18.0 mm: approx. 230 g</li></ul>
Type plate:	Adhesive label

### Measuring insert

Design:	Special measuring insert: Ø 6 mm; hygienic design. Measuring insert screwed into the clamp- ing element under spring tension.
Material:	Stainless steel Measuring element from silver, thermally isolated via PEEK element.
Measuring resistor:	<ul style="list-style-type: none"><li>■ Pt100 per EN 60751, class A 4-wire (also connectable in 3-wire)</li><li>■ Pt100 per EN 60751, class A 4-wire (3-wire bridged)</li><li>■ Pt100 per EN 60751, class A 3-wire</li><li>■ 2 x Pt100 per EN 60751, class A 3-wire</li></ul>
Degree of protection per EN 60529:	IP 67

### Process connection

Design:	Clamping element designed for installation with : <ul style="list-style-type: none"><li>■ clamping block for pipes Ø 4...57 mm</li><li>■ clamping shoe for pipes Ø 10...300 mm</li></ul>
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:	<ul style="list-style-type: none"><li>■ Transmitter, Type PA2430, for circular connector M12</li><li>■ Transmitter, Type PA2530 IO-Link, for circular connector M12</li><li>■ Transmitter head mounted, Type series PA210., 4...20 mA, programmable</li><li>■ Transmitter head mounted, Type series PA220., electrically isolated, classification per SIL 2</li><li>■ Transmitter head mounted, Type series PA230., electrically isolated, classification per SIL 2, HART®</li><li>■ Transmitter head mounted, Type series PA2420, 2 channel, classification per SIL 2/3, HART®</li></ul>
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## Tests and certificates

EC-Type Examination: TÜV 08 ATEX 554093 X

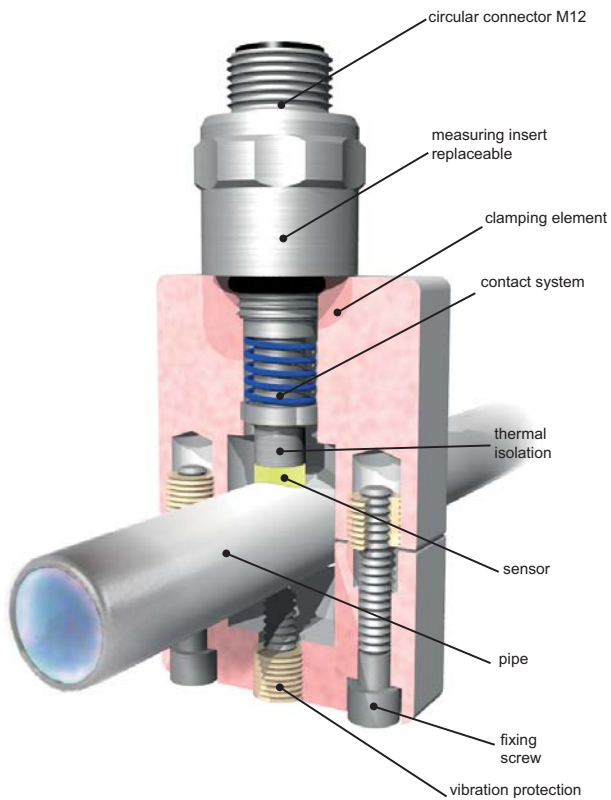
Type of Ex-protection:  $\text{Ex II 1G Ex ia IIC T6/T5/T4}$   
 $\text{Ex II 2G Ex ib IIC T6/T5/T4}$   
 $\text{Ex II 1D Ex iaD 20 T89 °C}$   
 $\text{Ex II 2D Ex ibD 21 T129 °C}$   
 $U_i \leq 30 \text{ V}$   
 $P_i \leq 200 \text{ mW}$   
 $C_i$  and  $L_i$  negligible small

Further details see Ex Safety Instruction XA\_001.

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

## Design

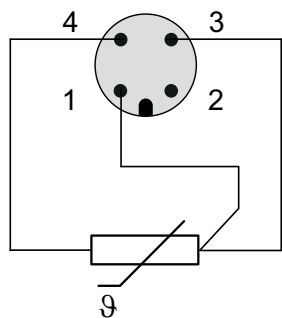
3D presentation



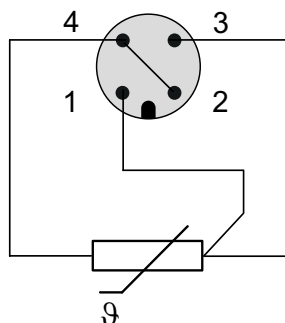
# Connection diagram

## Circular connector

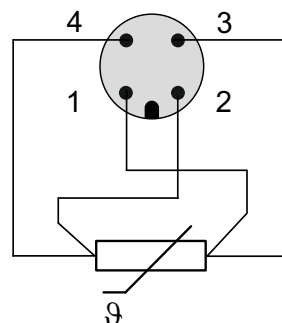
1 x Pt100, 3-wire



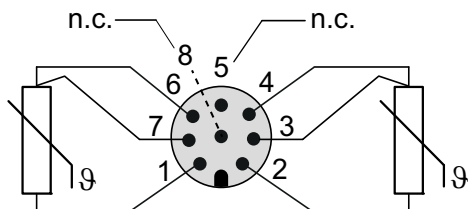
1 x Pt100, 4-wire (3-wire bridged)



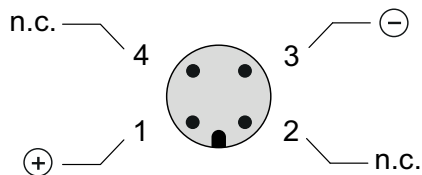
1 x Pt100, 4-wire



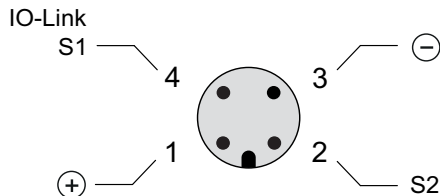
2 x Pt100, 3-wire



Transmitter (Type series PA2430)

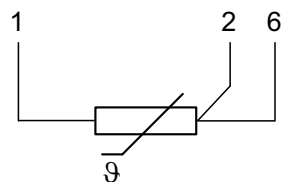


Transmitter IO-Link (Type series PA2530)

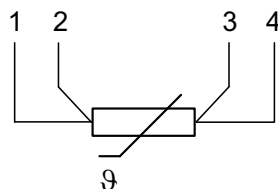


## Terminal block / cable gland

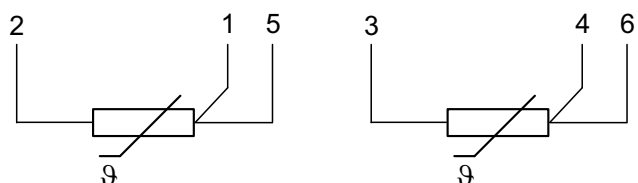
1 x Pt100, 3-wire



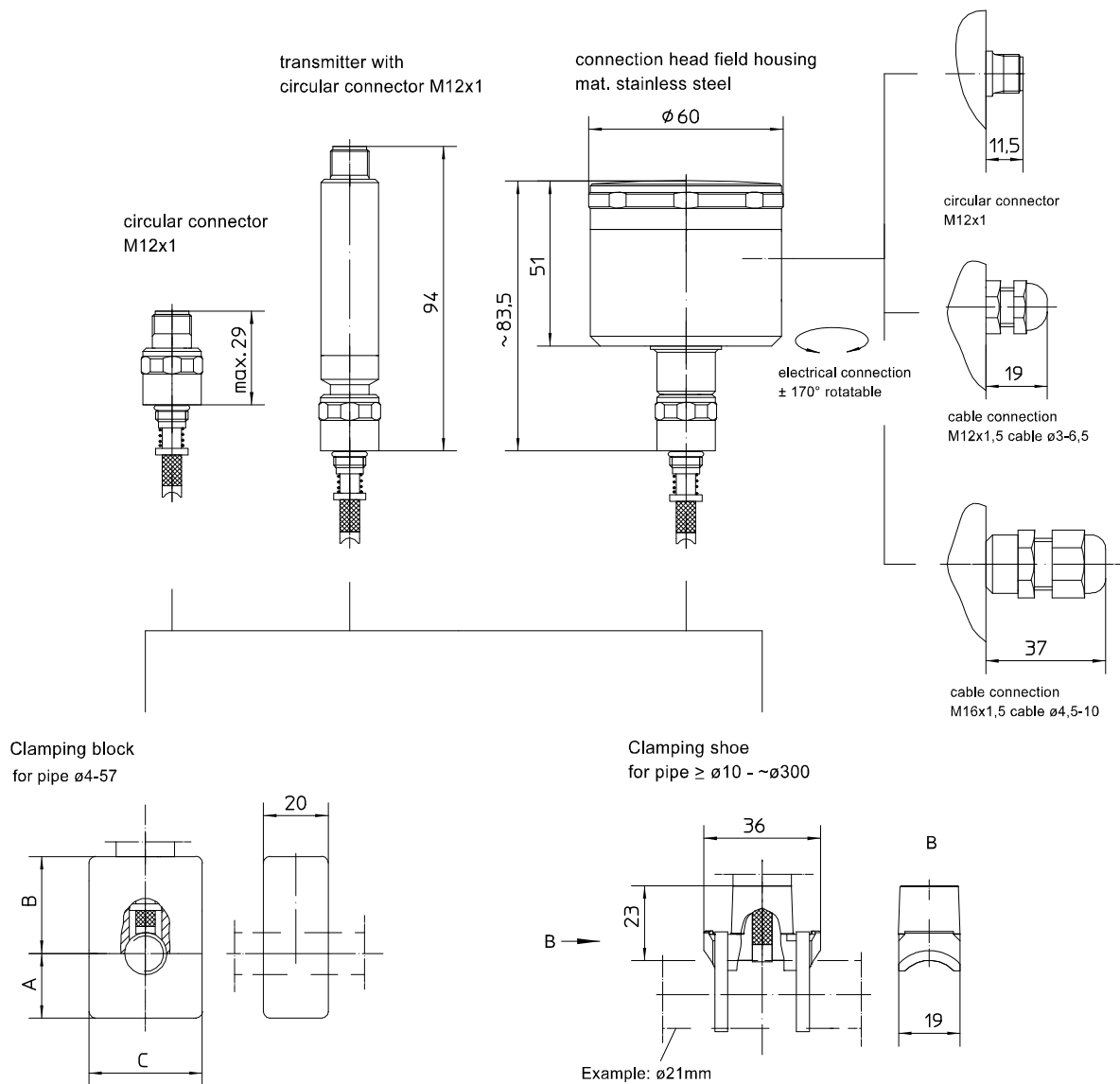
1 x Pt100, 4-wire



2 x Pt100, 3-wire



# Dimensions



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

additional features (to be indicated in case of need, only)		
<b>S71</b>	Ex marking	⊕ II 1G Ex ia IIC T6/T5/T4
<b>S72</b>		⊕ II 2G Ex ib IIC T6/T5/T4
<b>S73</b>		⊕ II 1D Ex iaD 20 T89°
<b>S74</b>		⊕ II 2D Ex ibD 21 T129°
<b>Z1</b>	incl. transmitter	for head mounting on the measuring insert (instead of terminal block) <sup>1</sup>
<b>Z52</b>		integrated in the circular connector M12, Type PA2430 <sup>1,2</sup>
<b>Z54</b>		integrated in the circular connector M12, Type PA2530 IO-Link <sup>1,2</sup>
<b>W2604</b>	functional safety per EN 61508, classification per SIL 2	

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

<sup>1</sup> selection of transmitters see www.labom.com

<sup>2</sup> not with ex-protection

<sup>3</sup> required for version with 2 x Pt100 measuring resistor (order code N5)