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J2A

Standard Bimetallic Thermometer

Working principle

Bimetal thermometers are based on the principle of solid thermal expansion, usually the two metal sheets with relatively large difference in expansion coefficient are welded together to form a bimetal temperature sensing element.

When the temperature changes, due to the relatively large difference in the linear expansion coefficient of the two different materials of the bimetal sheet, different expansion and contraction occur, resulting in bending deformation of the bimetal sheet.

According to the different amount of deformation and produce different momentum, the amount of rotation drives the connected shaft, the shaft drives the other end of the indicator needle, so that the indicator pointer can be pointed to the correct reading, indicating the temperature.

Product description

J2A bimetallic thermometer is the entry-level product of process thermometer. Its target market is the air conditioning and machinery manufacturing industries.

Type J2A bimetallic thermometers are manufactured in accordance with EN 13190, with stainless steel housing, accuracy class 1 and nominal size greater than 60mm.

J2A bimetal thermometer probe and its nominal size are widely used in different fields.

Product application

Widely used in mechanical manufacturing and tank body

Pipe and instrument manufacturing
Heating system

Functional characteristics

Range: -30 °C... +500 °C

Table circle diameter optional: 100mm/160 mm

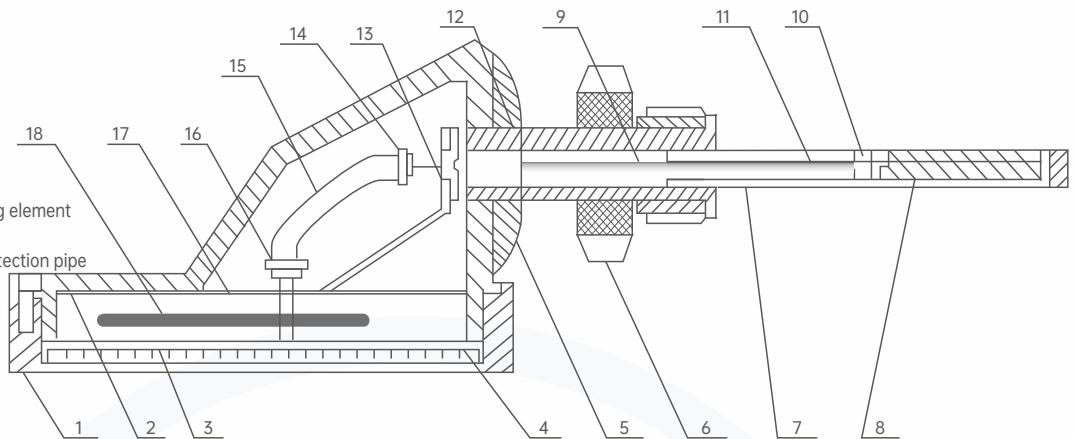
The casing and probe rod are made of stainless steel

Multiple interface design



Bimetallic thermometer Structure chart

1. Watch cover
2. shell
3. glass
4. Sealing ring
5. nut
6. Male joint
7. Outer protective tube
8. Bimetallic temperature sensing element
9. Driving shaft
10. Lower connection of inner protection pipe
11. Inner protective tube
12. External protection pipe fitting
13. support
14. Angle spring lower fastener
15. Angle spring
16. Angle spring upper fastener
17. Panel
18. pointer



Technical parameter

Measuring element	Bimetallic ring
Nominal size (mm)	100 and 160
Joint design	5 standard (External thread connection)
	1 Smooth rod (without thread)
	2 External thread nuts
	3 Coupling nut
	4 Movable sleeve (can slide on the probe)
	5 Other joint designs are available upon request
Unit (scale range)	°C [Optional: °F, °C/°F (dual scale)]
Accuracy class	Class 1, in accordance with EN 13190
Scope of work	Continuous load: measuring range, according to EN 13190
	Short time (up to 24 hours) : scale range, according to EN 13190
material	
■ Case, ring, probe	Stainless steel
■ Process connections and gaskets	Stainless steel
A bend in the back of the housing	Aluminum, radial mounting type only
Dial plate	Aluminum, white, black print
pointer	Aluminum, black, adjustable pointer
Watch window	Instrument glass
Allowable working pressure of the probe rod	Max. 2.5 MPa (static pressure)
Class of protection	IP43, in accordance with IEC/EN 60529

Scale range, measuring range ¹⁾, Error limit (EN 13190)

1) The limits of the measuring range are indicated by two triangular marks on the dial. Only within this range can the error limits specified in EN 13190 be guaranteed.

Scale according to LUDWIG's standard

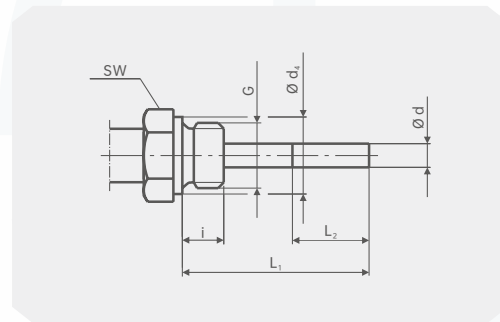
Range (unit: °C)	Measuring range (unit: °C)	Minimum scale value (unit: °C)	Error limit (± °C)
-30 ... +50	-20 ... +40	1	1
-20 ... +60	-10 ... +50	1	1
-20 ... +80	-10 ... +70	1	1
0 ... 60	10 ... 50	1	1
0 ... 80	10 ... 70	1	1
0 ... 100	10 ... 90	1	1
0 ... 120	10 ... 110	2	2
0 ... 160	20 ... 140	2	2
0 ... 200	20 ... 180	2	2
0 ... 250	30 ... 220	5	2.5
0 ... 300	30 ... 270	5	5
0 ... 400	50 ... 350	5	5
0 ... 500	50 ... 450	5	5

Joint design

Standard design (external thread connection)

Standard insertion length
L1= 63, 100, 160, 200 and 250 mm

- Icon symbol:
 G Male thread
 l Thread length
 Ød4 Seal ring diameter
 SW Wrench width
 Ød Rod diameter
 L2 Effective length

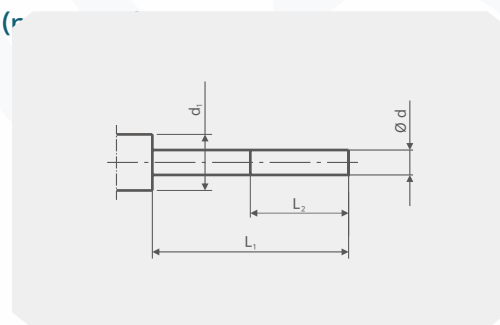


Nominal size	Process connection		Size (mm)		
	G	i	SW	Ød ₄	Ød
100,160	G1/2B	12	19	18	6 or 8
	G3/4B	14	27	26	6 or 8
	M18×1.5	12	24	23	6 or 8
	3/4NPT	19	22	-	6 or 8

Design 1, smooth rod (r)

Standard insertion length
L1= 45, 63, 100, 140, 160, 200, 240 and 290 mm

- Icon symbol:
 Ød1 aperture
 Ød Rod diameter
 L2 Effective length

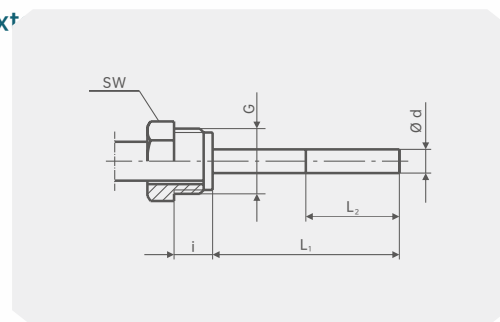


Nominal size	Size (mm)	
NS	Ød ₁	Ød
100,160	18	6 or 8

Design 2, nuts with ext

Standard insertion length
L1=80, 140, 180and 230mm

- Icon symbol:
 G Male thread
 l Thread length
 SW Wrench width
 Ød Rod diameter
 L2 Effective length



Nominal size	Process connection		Size (mm)	
	G	i	SW	Ød
100,160	G1/2B	20	27	6 or 8
	M18×1.5	17	22	6 or 8

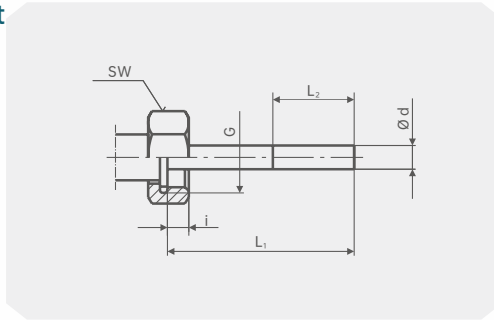


Joint design

Design 3, coupling nut

Standard insertion length
 L1=89, 126, 186, 226 and 276 mm

Icon symbol:
 G Male thread
 I Thread length
 SW Wrench width
 Ød Rod diameter
 L2 Effective length

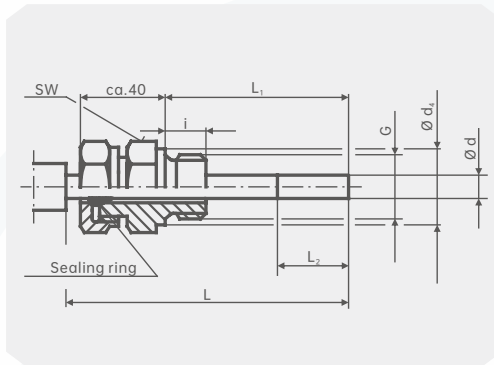


Nominal size	Process connection		dimension(mm)	
	G	i	SW	Ød
100,160	G1/2	8.5	27	6 or 8
	G3/4	9.5	32	6 or 8

Design 4, active card sleeve(Slide on the probe)

Standard insertion length
 L1=89, 126, 186, 226 and 276 mm

Icon symbol:
 G Male thread
 I Thread length
 Ød4 Seal ring diameter
 SW Wrench width
 Ød Rod diameter
 L2 Effective length



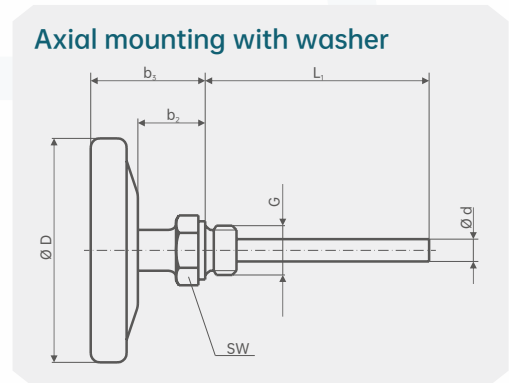
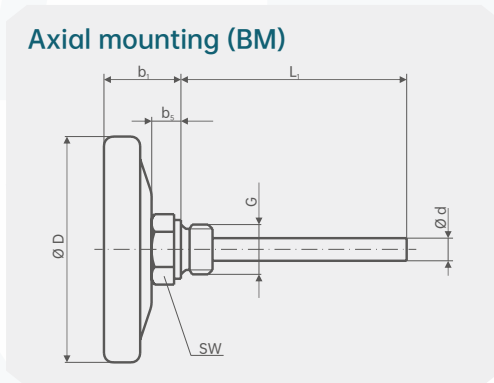
Nominal size	Process connection		Size (mm)		
	G	i	SW	Ød ₄	Ød
100,160	G1/4B	8	22	18	6 or 8
	G1/2B	14	27	26	6 or 8
	M18×1.5	12	24	23	6 or 8
	1/2NPT	19	22	-	6 or 8
	G3/4B	16	32	32	6 or 8
	3/4NPT	20	30	-	6 or 8

Size mm

Axial mounting (BM)
 (Max 250°C)

Axial mounting with washer

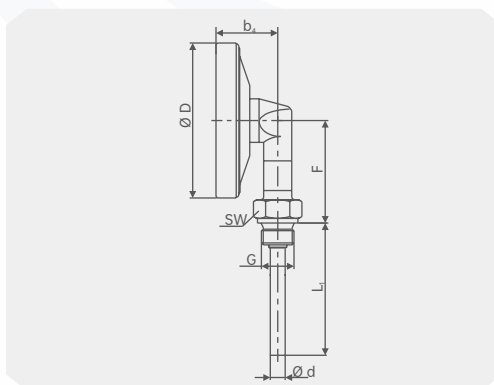
(Models ≥300 °C can be provided according to customer requirements)



Radial mounting (LM)

1) Models ≥300°C can be provided according to customer requirements

- R Axial mounting (BM)
- RD axial installation, with spacing
- U Radial Mounting (LM)



NS	Size (mm)					ØD ₁	F	R	RD	U
	b1	b2	b3	b4	b5					
100	35	30 ¹⁾	52	40	13	100	66	0.250	0.290	0.330
160	39	30 ¹⁾	57	42.5	13	160	96	0.450	0.490	0.560

J2A-Selection composition

Selection example **J2A**



1.Installation form	A	Cardan type
	B	Radial type
	C	Axial type
	T()	Other installation forms
2.material	S	304SS
	L	316L
	T()	Other materials
3.Dial diameter	G	100mm
	H	160mm
4.precision	J	1.6%
	K	1.0%
5.Process connection	N	Fixed thread
	O	Sliding thread
6.Connection specification	U	G1/2 Male thread
	V	G1/4 Male thread
	W	1/2NPT Male thread
	X	1/4NPT Male thread
	Y	M14*1.5 Male thread
	Z	M20*1.5 Male thread
	S	M27*2 Male thread
T()	Other specifications	
6.1.Flange specification	H	DN10
	I	DN15
	J	DN25
	K	DN50
	L	DN80
	M	DN100
	T()	Other flange specifications
7.Rod diameter(mm)	A	6
	B	8
	C	10
	D	12
	T()	Other probe diameters
8.Rod length(mm)	G	100
	H	150
	I	200
	J	250
	K	300
	L	350

J2A-Selection composition

Selection example J2A

1	B	2	S	3	G	4	J	5	N	6	U	7	A	8	I	9	C
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8.Rod length(mm)	M	400
	N	450
	O	500
	T()	Other lengths
9.Measuring range(°C)	R	-50~50
	S	-30~50
	T	-20~60
	U	0~50
	V	0~80
	W	0~100
	X	0~150
	Y	0~200
	Z	0~250
	A	0~300
	B	0~350
	C	0~400
	D	0~450
	E	0~500
T()	Other temperature ranges	
10.Special requirements	T()	Remark

Instructions:

It means that the installation method of J2A bimetal thermometer is radial, the material is 304 stainless steel, the dial diameter is 100mm, the accuracy is 1.6%, the fixed thread connection, the thread specification is G1/2 external thread (6.6.1 bit binary option), the diameter of the probe rod is 6mm, the length of the probe rod is 200mm, the measuring range is 0~400°C, and the measurement range is 0~400°C. Item 10 is optional.

Product Certification

Compliance and approval Ludwig thermometers meet key standards and certifications for process measurement technology; Thus guaranteeing the highest reliability in such a setup;