

[The selection is detailed on page 14](#)

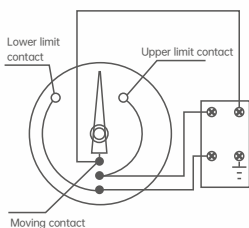


J5E

Bimetal Thermometer With Electric Contact

Working principle

Electric contact bimetal thermometer is the use of temperature changes to drive the contact change, when it and the upper and lower limits of contact contact or disconnect at the same time, so that the relay in the circuit action, so as to automatically control and alarm.



Product description

Electric contact bimetallic thermometers have been developed and manufactured in accordance with EN13190. The high quality thermometers are specially designed for the application requirements of the process industry. Especially in the chemical and petrochemical, oil and gas and power industries, all stainless steel temperature measuring instruments have been successfully applied.

Electric contact bimetallic thermometers have high resistance to corrosive media. Optionally, 316Ti (1.4571) is used for the probe and process connection to meet the highest requirements.

Different insertion depths and process connections can be selected according to the actual process application requirements. The J5E bimetal thermometer meets the measurement requirements in demanding application environments. Easy-to-operate reset screws on the back of the housing allow quick adjustment of the reference temperature within a limited range, reducing maintenance and recalculation costs. Electric contact thermometers are also available in a variety of rod lengths (insertion length L1) to optimize their configuration and performance for specific applications.

Product application

Control and regulate industrial processes
 Monitor plant and switching circuits
 Chemical industry, petrochemical industry, process technology and food industry
 Suitable for corrosive media

Functional characteristics

High reliability, long service life, wide application range
 Stainless steel housing and probe rod
 Instrument with explosion-proof electrical contact for use in hazardous areas
 Electric contact meter for PLC applications

Technical parameter

Measurement principle	Inert gas expansion system
Nominal size (mm)	100 and 160
Storage and transport temperature limits	- 50... +70 °C, no liquid damping - Forty... +70 °C, liquid damping
Joint design	S standard (Male thread joint) 1 Smooth rod probe rod (without thread) 2 male nuts 3 Pipe connection nuts 4 Movable sleeve (slide on the probe) 5 Pipe nuts and loose threaded connectors 6 Adjustable sleeve (adjustable on capillary or spiral case) 7 Active card sleeve at the case
Accuracy class	Level 1 according to EN13190 23 °C±10 °C Ambient temperature
Scope of work	Normal (1 year) : Measuring range (EN 13190) Short term (up to 24 hours) : Range (EN 13190)
Instrument version	Axial mounting Radial direct mounting Axial mounting (adjustable probe and dial) Gauges with capillaries
Allowable ambient temperature	- Twenty... +60 °C There is no liquid damping
Case, ring, process connection	Stainless Steel 1.4301
Probe rod material	Stainless Steel 1.4571
Connecting bulb	120 x 22 x 12 mm, stainless steel 1.4571
Adjustable probe and dial	Stainless steel It can be rotated 90° It can be rotated 360°
window	Laminated safety glass
Capillary tube (length can be set according to customer requirements)	Diameter: 2mm, stainless steel 1.4571, bending radius is not less than 6mm Standard capillaries: up to 60 m Capillaries with spiral sleeves: up to 40 m Capillary tubes with PVC coating: up to 20 m
pointer	Black aluminum adjustable hands
Electrical connection	Hersman joint
Feeler rod allows working pressure	Maximum 2.5MPa, static pressure
Class of protection	IP 65, according to EN/IEC 60529 (Reverse polarity protection)
Instrument mounting types with capillaries	Surface mount flange, stainless steel Meter mounting bracket, aluminum die cast Panel mount flange, stainless steel

Technical parameters - Optional

Range °C / °F (dual scale)

Case with liquid damping

Capillary armouring coating: 7 mm diameter spiral protective sleeve, flexible or PVC coated

Rod diameter: 6, 10, 12 mm (other available on request)

Electrical data

Power source UB			
▪ 4-20mA	DC $12 \leq UB \leq 30V$		
▪ 0-10V	DC $15 \leq UB \leq 30V$		
Power effect	\leq Full scale value 0.1%/10V		
Permissible residual ripple	$\leq 10\%$ ss		
Output signal, version I	4-20mA, 2Linear, passive, according to NAMUR NE43		
Maximum allowable load RA	$RA \leq (UB-12V) / 0.02$, RA The unit is Ω , the UB unit is V, and the maximum value is $V600\Omega$		
Load effect	\leq Full scale value 0.1%		
Output signal, version II	0...10, 3-wire type		
Voltage output impedance	0.5 Ω		
Voltage output load capacity	2...100 k Ω		
Sensor sampling rate	600ms		
Linear error	\leq FS 1.0% (Terminal method)		
Output signal accuracy	0.2% of full scale value (electronics only)		
Resolution	Full scale value 0.15% (360° for 10-bit resolution)		
Refresh rate	$> 1/s$		
Input signal, rotation Angle	0...270°		
Long-term stability of electronic products	$<$ Full scale value 0.3%/a		
Electronic product temperature error	$<$ Full scale value 0.3%/10k (over the entire temperature range)		
Preheating time	\leq Five minutes		
Electrical connection	With Hersman connector, 180° rotation, Max. 1.5 mm ² , cable protection, M20x1.5 cable connector, cable OD: 7... 13mm, including overflow port		
Terminal name	terminal	variant I	variant II
Depends on output signal version	type	4-20mA	0...10V
	1	GND	GND
	2	I	U_b
	3	reserve	U_{OUT}
	4	reserve	reserve
	5	reserve	reserve
	6	reserve	reserve

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 standard

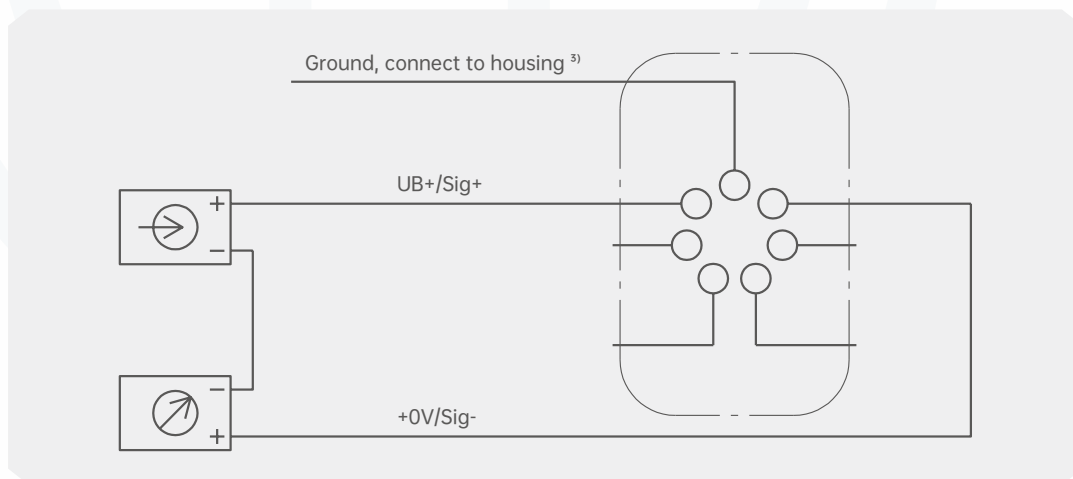
Range (unit: °C)	Measuring range (unit: °C)	Minimum scale value (unit: °C)	Error limit (± °C)
-80 ... +60	-60 ... +40	2	2
-60 ... +40	-50 ... +30	1	1
-40 ... +60	-30 ... +50	1	1
-30 ... +50	-20 ... +40	1	1
-20 ... +60	-10 ... +50	1	1
-20 ... +80	-10 ... +70	1	1
0 ... 60	10 ... 50	1	1
0 ... 80	10 ... 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
0 ... 600	100 ... 500	10	10
0 ... 700	100 ... 600	10	10

Name of the connection terminal²⁾

1) The measuring range is indicated by two triangle marks on the dial. Only within this range are the error limits specified in accordance with EN 13190 valid.

2) For 3-wire connection.

3) The connection shall not be used for equipotential connections. The instrument must be connected by a process connection with an equal potential connection.

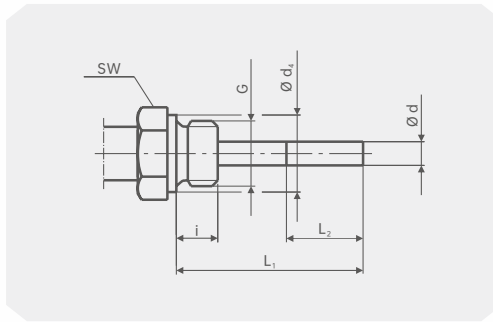


Joint design

Standard design (external thread connection)¹⁾

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

- Icon symbol:
 G Male thread
 I Thread length
 Ø d4 Seal ring diameter
 SW Wrench width
 Ø d Rod diameter
 L2 Effective length



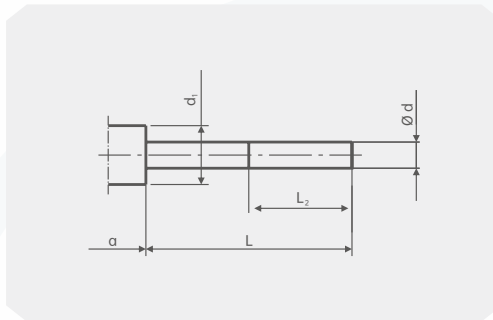
Nominal size	Process connection	Dimension(mm)			
		i	SW	Ød ₄	Ød
NS 100,160	G1/2B	14	27	26	8
	G3/4B	16	32	32	8
	1/2NPT	19	22	-	8
	3/4NPT	20	30	-	8

1)Not applicable to versions with capillaries

Design 1, smooth rod (no thread)

Standard insertion length
 L1=100, 140, 200, 240, 290mm
 Design basis 4, movable card sleeve

- Icon symbol:
 a Distance from case/loose joint
 Ø d1 Rod diameter
 Ø d Rod diameter
 L2 Effective length



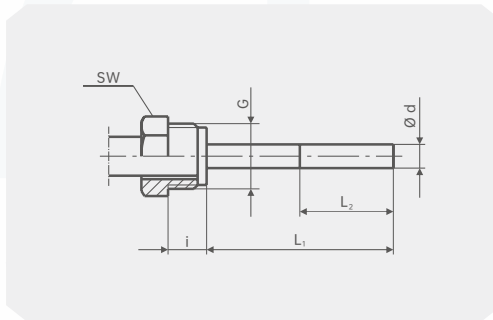
Nominal size	size (mm)			
	d1 ¹⁾	Ød	a Axial direction	a Adjustable probe and dial
NS 100,160	18	8	15	15

1)Not applicable to versions with capillaries

Design 2, outer nut

Standard insertion length
 L=89, 126, 186, 226, 276mm

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

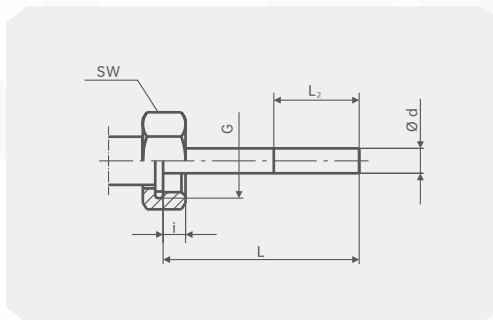


Nominal size	Process connection	Size (mm)		
		i	SW	Ød
NS 100,160	G1/2B	20	27	8
	M20×1.5	17	22	8

Design 3, pipe nut

Standard insertion length
 L=89, 126, 186, 226, 276mm

- Icon symbol:
 G Male thread
 I Thread length
 Ø d4 Seal ring diameter
 SW Wrench width
 Ø d Rod diameter
 L2 Effective length

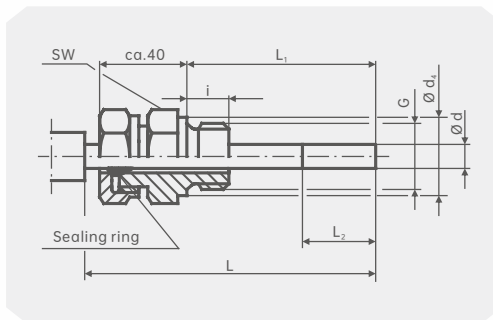


Nominal size	Process connection	Size (mm)		
		i	SW	Ød
NS 100,160	G1/2B	8.5	27	8
	G3/4B	10.5	32	8
	M24×1.5	13.5	32	8

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

Insert length L = variable
 Length L1=1L+40mm

- Icon symbol:
 G Male thread
 I Thread length
 Ø d4 Seal ring diameter
 SW Wrench width
 Ø d Rod diameter
 L2 Effective length



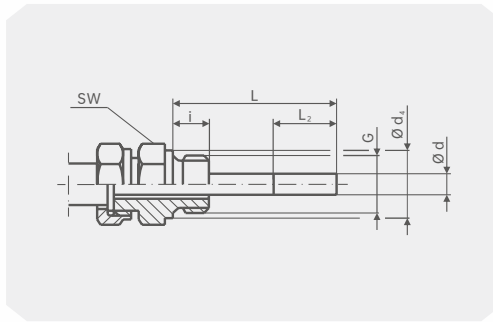
Nominal size	Process connection	Size (mm)			
		i	SW	Ød ₄	Ød
NS 100,160	G1/2B	14	27	26	8
	G3/4B	16	32	32	8
	M18×1.5	12	24	23	8
	1/2NPT	19	22	-	8
	1/4NPT	20	30	-	8

Joint design

Design 5, pipe connecting nut and loose Threaded joint

Standard insertion length
 L1= 63, 100, 160, 200 and 250 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)			
		i	SW	Ød ₄	Ød
100,160	G1/2B	14	27	26	8
	G3/4B	16	32	32	8
	1/2NPT	19	22	-	8
	1/4NPT	20	30	-	8

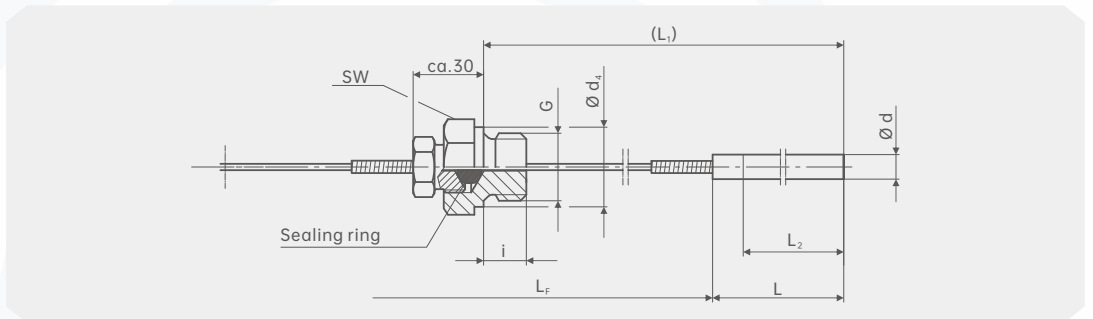
Optional:

Joint with pipe nut M24x1.5 And loose threaded joints M18x1.5

Nominal size	Process connection	Size (mm)			
NS	G	i	SW	Ød ₄	Ød
100,160	M18x1.5	12	22	23	8

Design 6.1, activity card sleeve, in wool Sliding on thin tube (movable sleeve for Leakproof)

Insert length L: L= variable
 Sensor length L:
 Standard 200 mm, Ød=6mm
 Standard 170 mm, Ød=8mm
 Standard 100 mm, Ød≥10mm

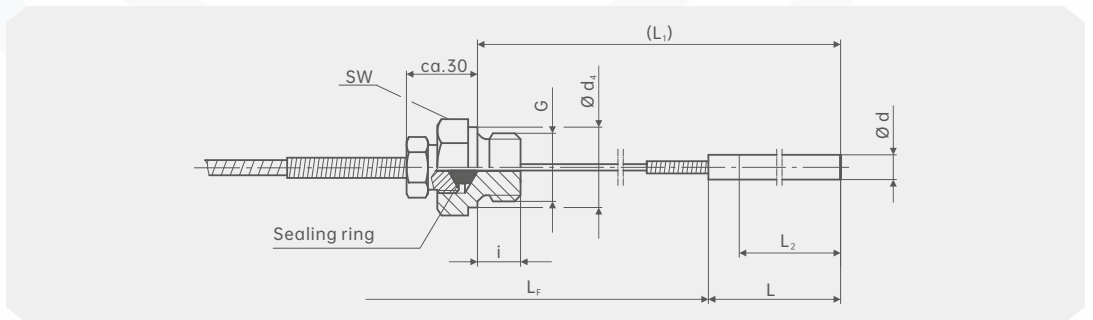


Nominal size	Process connection	Size (mm)			
NS	G	i	SW	Ød ₄	Ød
100,160	G1/2B	14	27	26	8
	G3/4B	16	32	32	8
	1/2NPT	19	22	-	8
	1/4NPT	20	30	-	8

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

Design 6.2, activity card sleeve, in wool Sliding on thin tube (movable sleeve for Leakproof)

Insert length L: ≥300mm,
 Ød=6 or 8mm ≥ 200mm,
 Ød = 10 mm or greater
 Sensor length L:
 Standard 200mm, Ød =6 mm
 Standard 170mm, Ød = 8mm
 Standard 100mm, Ød ≥ 10mm



Nominal size	Process connection	Size (mm)			
NS	G	i	SW	Ød ₄	Ød
100,160	G1/2B	14	27	26	8
	G3/4B	16	32	32	8
	1/2NPT	19	22	-	8
	1/4NPT	20	30	-	8

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



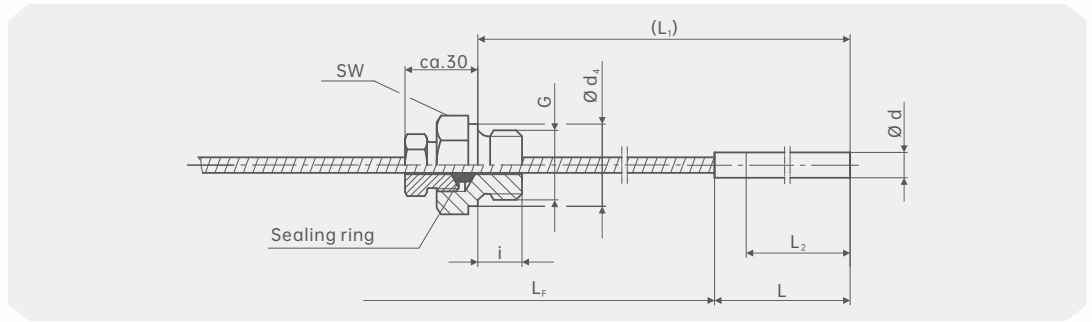
Joint design

Design 6.3, activity card sleeve, in the screw Stripe protector on sliding (activity card Sleeve is not leak-proof)

Insert length L: L = variable
 Sensor length L:
 Standard 200 mm, $\varnothing d=6\text{mm}$
 Standard 170 mm, $\varnothing d=8\text{mm}$
 Standard 100 mm, $\varnothing d \geq 10\text{mm}$

Icon symbol:

- G Male thread
- I Thread length
- LF Capillary length
- $\varnothing d_4$ Seal ring diameter
- SW Wrench width
- $\varnothing d$ Rod diameter
- L2 Effective length



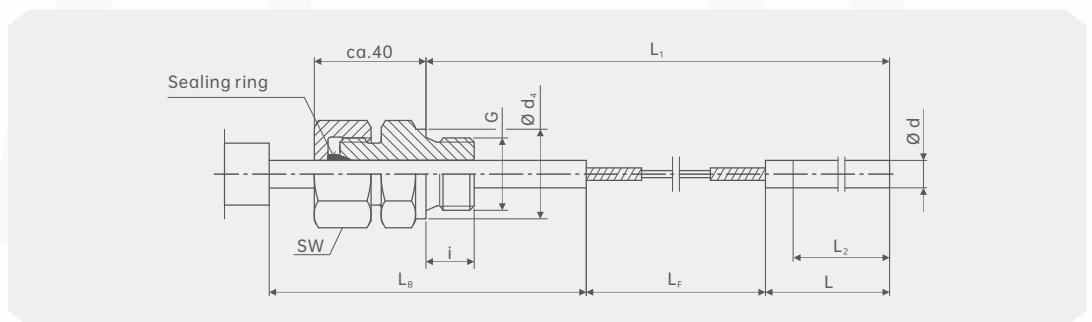
Nominal size	Process connection	Size (mm)			
NS	G	i	SW	$\varnothing d_4$	$\varnothing d$
100,160	G1/2B	14	27	26	8
	G3/4B	16	32	32	8
	1/2NPT	19	22	-	8
	1/4NPT	20	30	-	8

Design 7, active card sleeve at the case

Insert length L: $L \geq 400$
 Sensor length L:
 Standard 200 mm, $\varnothing d=6\text{mm}$
 Standard 170 mm, $\varnothing d=8\text{mm}$
 Standard 100 mm, $\varnothing d \geq 10\text{mm}$
 LB = Standard 100mm (other available on demand)

Icon symbol:

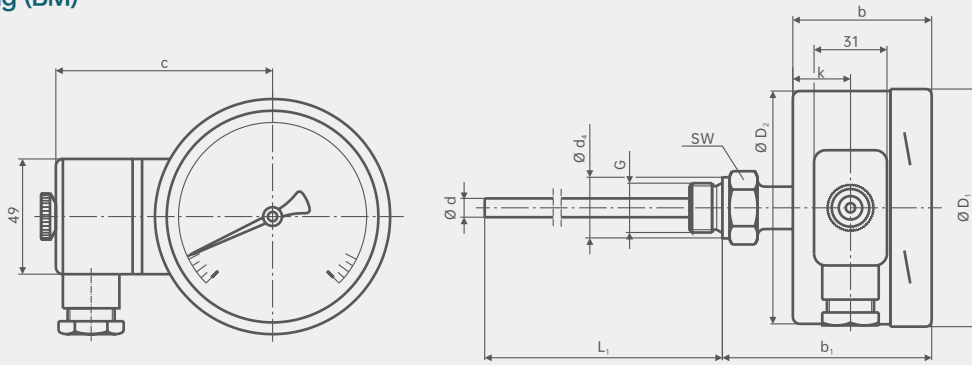
- G Male thread
- I Thread length
- LF Capillary length
- LB Mounting shaft
- $\varnothing d_4$ Seal ring diameter
- SW Wrench width
- $\varnothing d$ Rod diameter
- L2 Effective length



Nominal size	Process connection	Size (mm)			
NS	G	i	SW	$\varnothing d_4$	$\varnothing d$
100,160	G1/2B	14	27	26	8
	G3/4B	16	32	32	8
	1/2NPT	19	22	-	8
	1/4NPT	20	30	-	8

Size mm

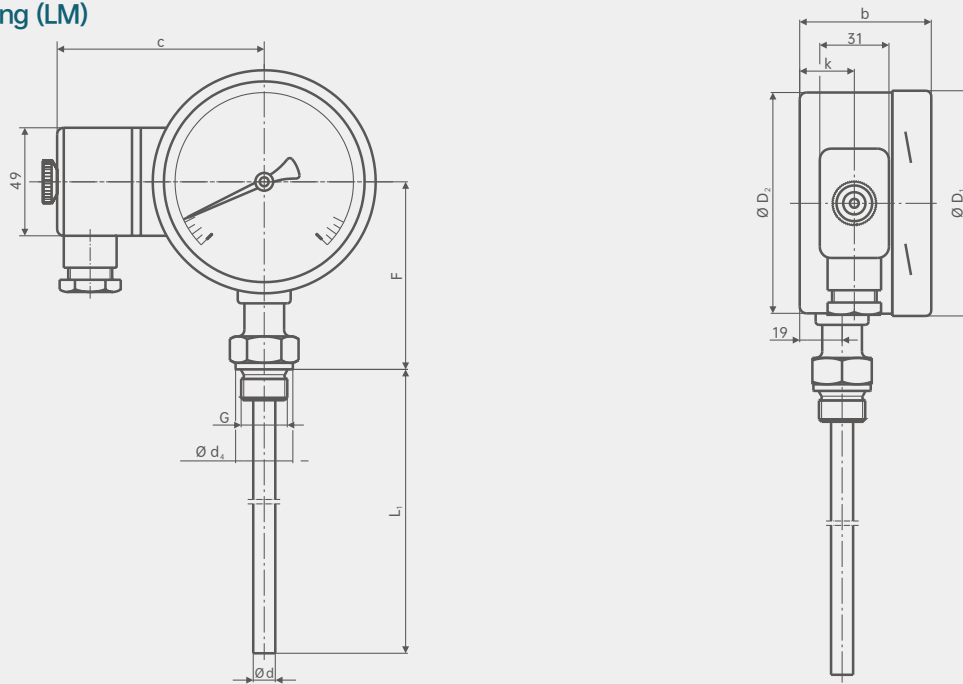
Axial mounting (BM)



Nominal size	Size (mm)										weight (kg)
	NS	b ¹⁾	b ¹⁾	c	Ød	Ød ₄	ØD ₁	ØD ₂	G	F ³⁾	
100	60/68	92/100	94	8 ²⁾	26	101	99	G1/2B	85	25	1.3
160	66/70	99/103	122	8 ²⁾	26	161	159	G1/2B	114	32	1.5

1) Depending on the desired measuring system 2) Options: rod diameter 6,10,12 mm 3) Scale range ≥0... At 300°C, the size increases by 40 mm

Radial mounting (LM)



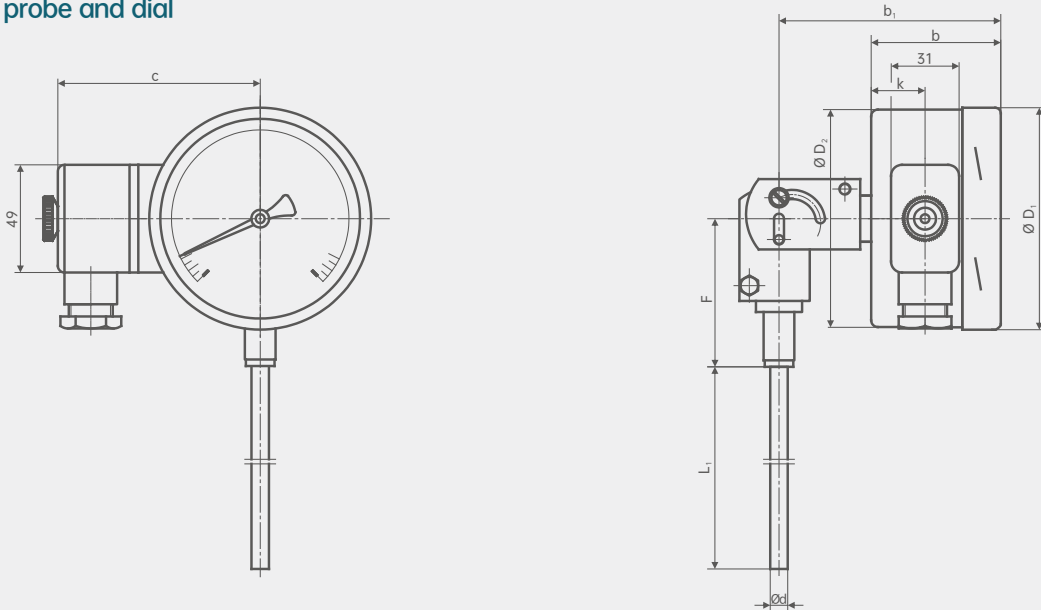
Nominal size	Size (mm)										weight (kg)
	NS	b ¹⁾	b ¹⁾	c	Ød	Ød ₄	ØD ₁	ØD ₂	G	F ³⁾	
100	60/68	92/100	94	8 ²⁾	26	101	99	G1/2B	85	25	1.3
160	66/70	99/103	122	8 ²⁾	26	161	159	G1/2B	114	32	1.5

1) Depending on the desired measuring system 2) Options: rod diameter 6,10,12 mm 3) Scale range ≥0... At 300°C, the size increases by 40 mm



Size mm

Axial mounting (BM)
Adjustable probe and dial

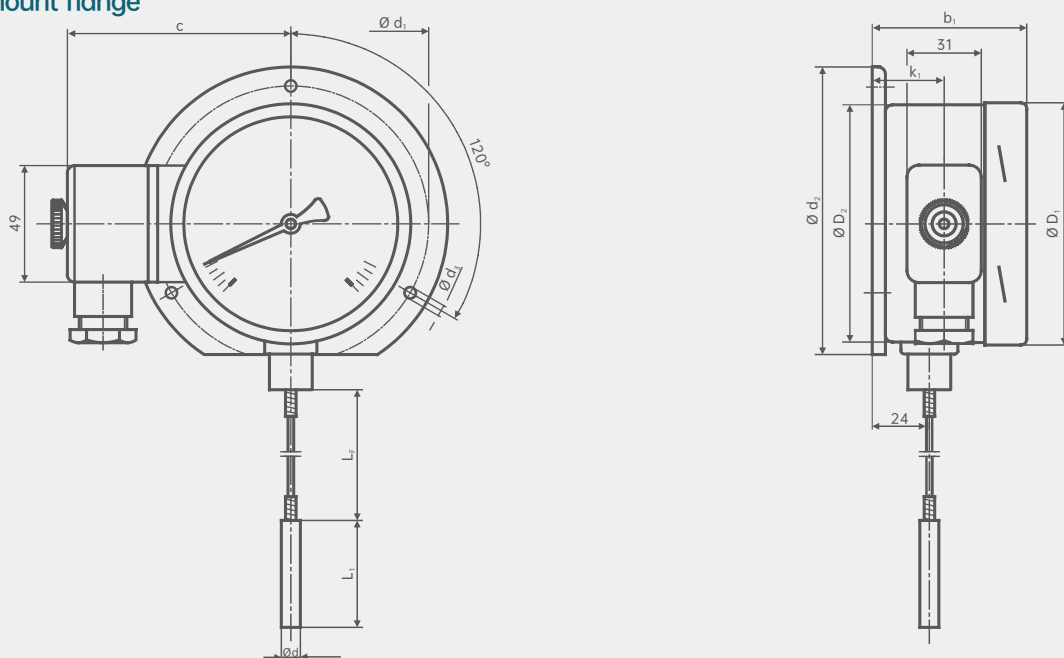


Nominal size	Size (mm)							
NS	b ¹⁾	b ¹⁾	c	Ød	ØD ₁	ØD ₂	F	k
100	60/68	104/112	94	8 ²⁾	101	99	68	25
160	66/70	110/114	122	8 ²⁾	161	159	68	32

1) Depending on the measurement system required 2) Options: probe diameter 6,10,12 mm

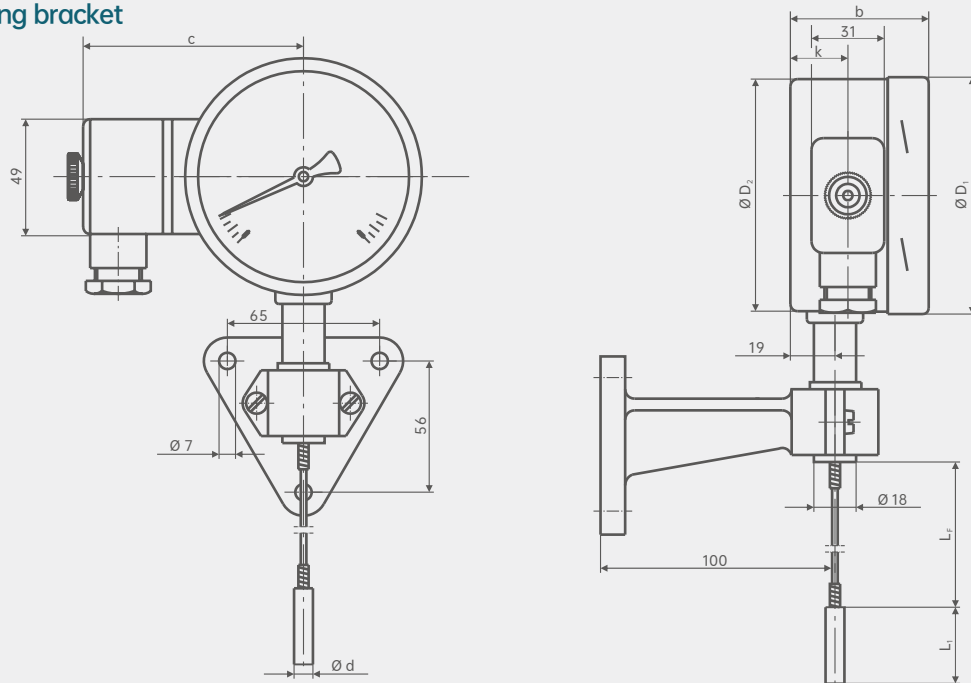
Meter size with capillary tube (unit: mm)

Surface mount flange

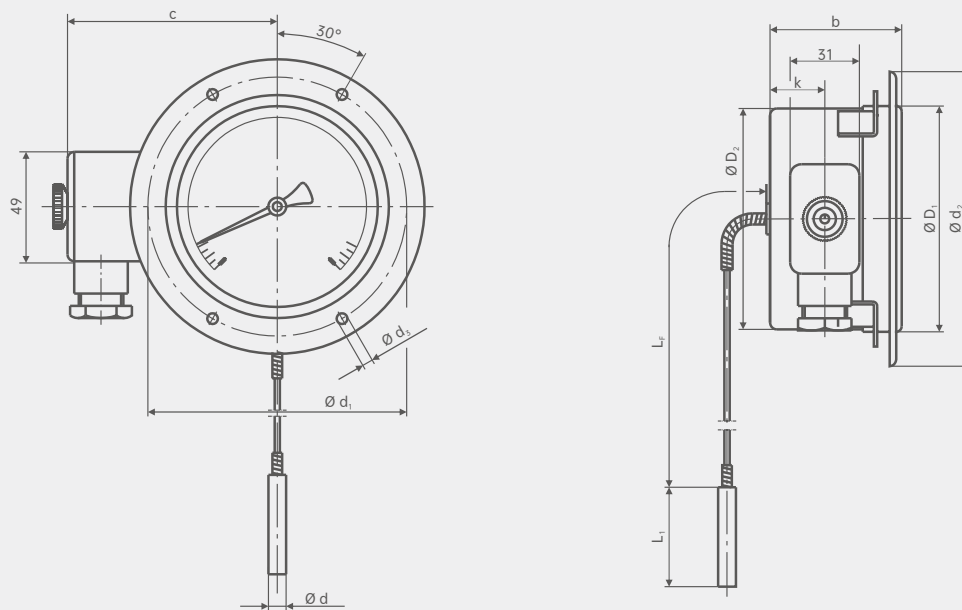


Meter size with capillary tube (unit: mm)

Meter mounting bracket



Panel mounting flange

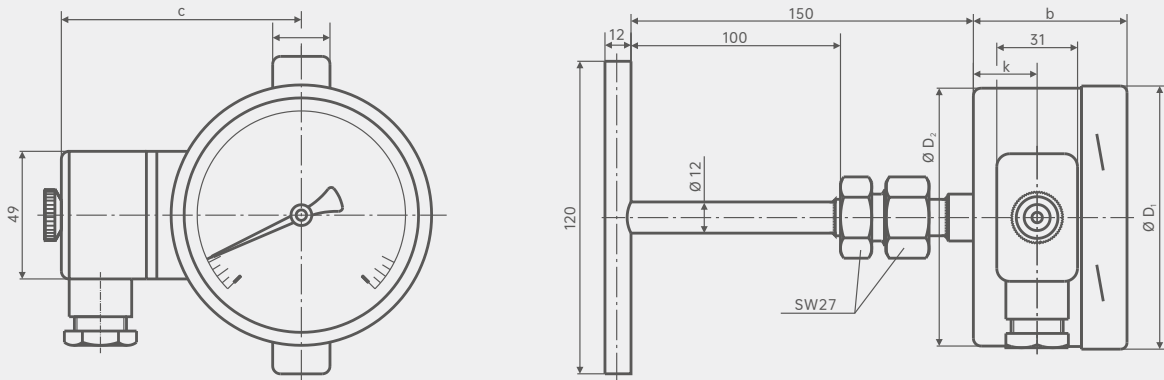


Nominal size	Size (mm)										
NS	b ¹⁾	b ¹⁾	c	Ød	Ød ₁	Ød ₂	Ød ₃	ØD ₁	ØD ₂	k	k ₁
100	60/68	65/73	94	8 ²⁾	116	132	4.8	101	99	25	30
160	66/70	72/76	122	8 ²⁾	178	196	5.8	161	159	32	37

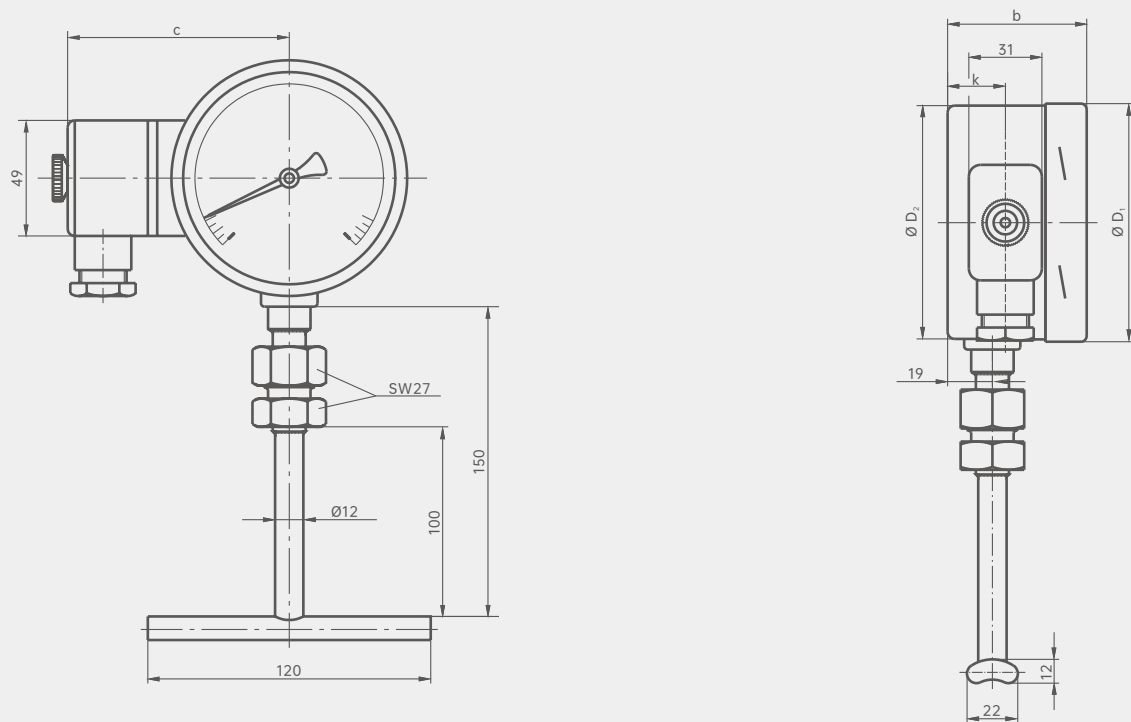
1) Depending on the desired measuring system 2) options: probe diameter 6,10,12 mm

Dimensions of instrument with connected bulb (unit: mm)

Axial mounting (BM)

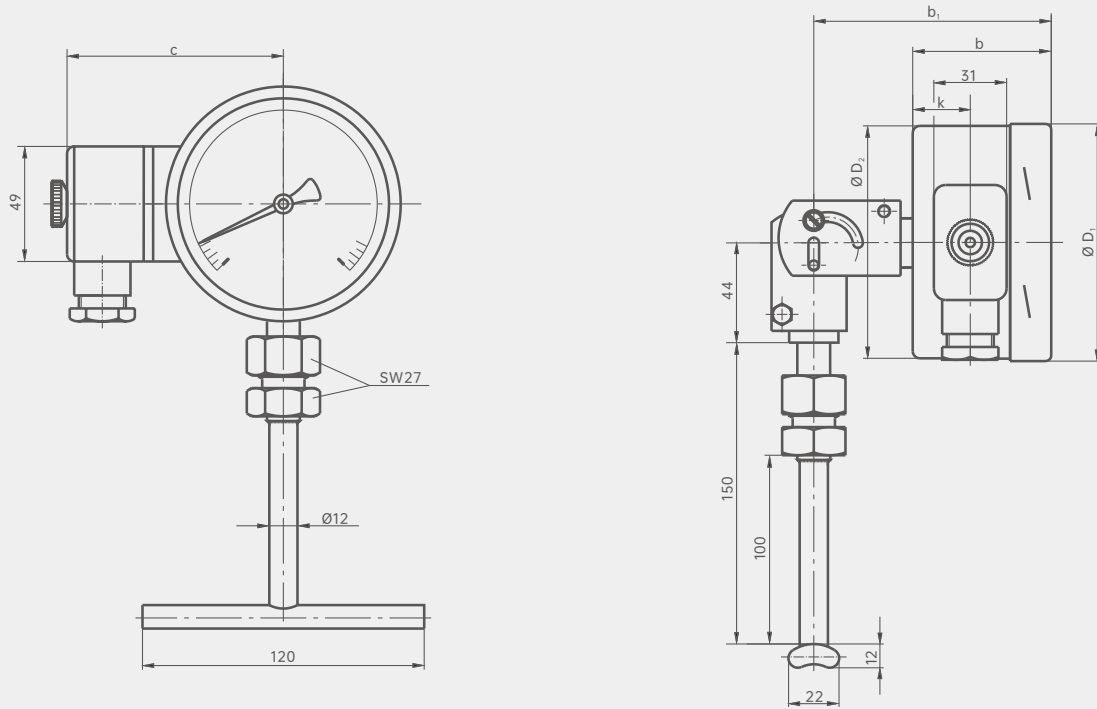


Radial direct mounting (LM)



Dimensions of instrument with connected bulb (unit: mm)

Axial mounting, adjustable probe and dial

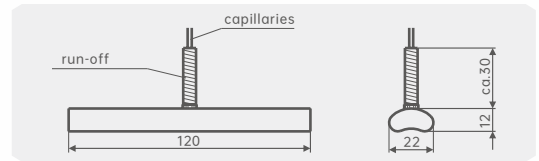


Joint position	Nominal size	Size (mm)		c	ØD ₁	ØD ₂	k
	NS	b ¹⁾	b ¹⁾				
Axial mounting	100	60/68	104/112	94	101	99	25
	160	66/70	110/114	122	161	159	32
Radial direct mounting	100	60/68	104/112	94	101	99	25
	160	66/70	110/114	122	161	159	32
Adjustable probe and dial	100	60/68	104/112	94	101	99	25
	160	66/70	110/114	122	161	159	32

Connecting ball

Installation instructions

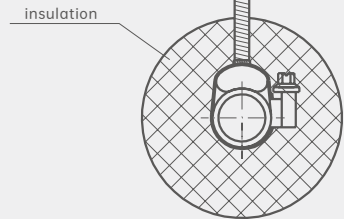
The connecting bulb is designed for installation on pipes or sinks, and the installation of such thermometers must ensure that the entire length of the connecting bulb is in contact with the measuring point. The basic requirement to ensure accurate measurement results is to maintain good thermal contact between the surface mounted contact ball and the outer wall of the pipe or tank, and to minimize heat loss that occurs through the surface mounted contact ball and the measuring point.



Install on the pipe

The geometry of the connecting bulb is designed for pipes with an outside diameter of 20 to 160 mm. When attaching the connecting ball to the pipe, a pipe clamp is sufficient. The connecting ball should have direct metal contact with the measuring point and be firmly in contact with the pipe surface. When the temperature is expected to be below 200 °C, a thermal hose can be used to optimize the heat transfer between the connecting bulb and the pipe. Isolation must be performed at the installation point to avoid errors due to heat loss. Insulation materials must have sufficient heat resistance and are not available for supply.

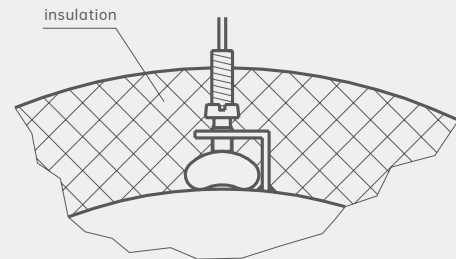
Clamp installation



Install on the pipe

The geometric design of the connected ball tube is suitable for water tanks with an external radius of 80 mm. If the outer radius of the installation point of the connecting ball tube installed on the upper surface of the sink is greater than 80 mm, it is recommended to use the middleware of the corresponding diameter of the sink, and its constituent materials have good thermal conductivity. The connecting balls can be secured to the sink using corner brackets and setting screws, or other similar methods. The connecting ball should be in direct metal contact with the measuring point and firmly in contact with the surface of the sink.

Angular bracket mounting



If the expected temperature is below 200 °C, a thermal paste can be used to optimize the heat transfer between the connecting bulb and the tank. Isolation must be performed at the installation point to avoid errors due to heat loss. Insulation materials must have sufficient heat resistance and are not available for supply.

Sheath

In theory, non-sheathed mechanical thermometers can be used under low process side loads (low pressure, low viscosity and low flow rate).

J5E-Selection composition

Selection example **J5E**



1.Installation form	A	Universal type
	B	Radial 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.Output signal type	N	Magnetic assistant type (1: normally open 2: normally closed)
	O	Inductive type (1: normally open 2: normally closed)
	P	Explosion-proof type (1: normally open 2: normally closed)
	T()	Other types
6.Process connection	S	Fixed thread
	F	Sliding thread
7.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
8.Rod diameter (mm)	A	6
	B	8
	C	10
	D	12
	T()	Other probe diameters
9.Rod length(mm)	G	100
	H	150
	I	200
	J	250
	K	300
	L	350
	M	400
	N	450
	O	500
	T()	other
10.Measuring range(°C)	Q	-50~50
	R	-30~50
	S	-20~60

J5E-Selection composition

Selection example **J5E**



10.Measuring range(°C)	T	0~50
	U	0~80
	V	0~100
	W	0~150
	X	0~200
	Y	0~250
	Z	0~300
	A	0~350
	B	0~400
	C	0~450
	D	0~500
T()	Other temperature ranges	
11.Special requirements	T()	Remark

Instructions:

It means that J5E type electric contact bimetal thermometer installation mode is radial, material 304 stainless steel, dial diameter 100mm, accuracy 1.6%, output signal is magnetically assisted, fixed thread connection, thread specification is G1/2 external thread, probe rod diameter 6mm, probe rod length 200mm, measuring range 0~350°C, the 11th item is not required.

Product certification

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