

Bimetal thermometer Model 54, industrial series

WIKA data sheet TM 54.01



for further approvals
see page 6

Applications

- General process instrumentation in the chemical and petrochemical industries, oil and gas industries, energy and water/wastewater industries
- Temperature measurement in harsh and aggressive environments
- With liquid damping also suitable for applications with high vibrations

Special features

- Scale ranges from -70 ... +500 °C
- Case and stem from stainless steel
- Bimetal with zero point adjustment at the back of the case
- Individual stem length from 63 ... 1,000 mm
- DNV GL approval (option)

Description

The model 54 bimetal thermometer has been developed and is manufactured in accordance with the EN 13190 standard. The thermometer meets the high requirements of the process industries.

Especially in the chemical and petrochemical, oil and gas, power engineering and shipbuilding industries, the temperature measuring instrument manufactured from stainless steel is used successfully. Through the high ingress protection of the thermometer (IP65) and its liquid damping, operation under high vibration conditions is possible.

The model 54 satisfies the high requirements for resistance against aggressive media. As an option, the casing, the stem and the process connection can be made from 316Ti (1.4571).

To allow optimum fitting to the process, individual insertion lengths and different process connections can be selected.



Fig. left: bimetal thermometer model A5402
Fig. right: bimetal thermometer, adjustable stem and dial version model S5412

Standard version

Measuring element

Bimetal coil

Nominal size in mm

63, 80, 100, 160

Connection designs

S Standard (male thread connection) ¹⁾

1 Plain stem (without thread)

2 Male nut

3 Union nut

4 Compression fitting (sliding on stem)

5 Union nut with fitting

1) Not for version "adjustable stem and dial"

Model overview

Model	NS	Design
A5400	63	Back mount (axial)
A5401	80	
A5402	100	
A5403	160	
R5440	63	Lower mount (radial)
R5441	80	
R5442	100	
R5443	160	
S5410	63	Back mount, adjustable stem and dial
S5411	80	
S5412	100	
S5413	160	

Accuracy class

Class 1 per EN 13190

Working range

Normal (1 year): Measuring range (EN 13190)

Short time (24 h max.): Scale range (EN 13190)

Case, ring

Stainless steel 1.4301 (304)

Stem, process connection

Stainless steel 1.4571 (316Ti)

Elbow behind the case

Aluminium, only with lower mount version

Dial

Aluminium, white, black lettering

Window

Instrument glass

Pointer

Aluminium, black, adjustable pointer

Insertion length L₁

63 ... 1,000 mm

minimum/maximum length is dependent on the measuring range and diameter

Permissible ambient temperature at case

-20 ... +60 °C (others on request)

Temperature limits for storage and transport

-20 ... +60 °C (EN 13190)

Permissible operating pressure at the stem

max. 25 bar, static

Ingress protection

IP65 per IEC/EN 60529

Options

- Scale range °F, °C/°F (dual scale)
- Liquid damping up to max. 250 °C (at the sensor)
- DNV GL approval in connection with liquid damping, not with adjustable stem and dial design or NS 160, vibration loading 25 ... 200 Hz, 5 g (for further information see certificate No. 40156-01 HH)
- Laminated safety glass, polycarbonate
- Stem diameter 6, 10 mm
- Ingress protection IP66
- Special measuring ranges or dial printing to customer specifications (on request)
- Version per ATEX

Scale ranges and measuring ranges ¹⁾ (EN 13190)
Scale graduation per WIKA standard

Scale range in °C	Measuring range ¹⁾ in °C	Scale spacing in °C
-70 ... +70	-50 ... +50	2
-70 ... +30	-60 ... +20	1
-50 ... +50	-40 ... +40	1
-50 ... +100	-30 ... +80	2
-50 ... +300	0 ... 250	5
-50 ... +500	0 ... 450	5
-30 ... +50	-20 ... +40	1
-20 ... +60	-10 ... +50	1
-20 ... +80	-10 ... +70	1
-20 ... +100	0 ... 80	2
-20 ... +120	0 ... 100	2
0 ... 60	10 ... 50	1
0 ... 80	10 ... 70	1
0 ... 100	10 ... 90	1
0 ... 120	10 ... 110	2
0 ... 160	20 ... 140	2
0 ... 200	20 ... 180	2
0 ... 250	30 ... 220	2
0 ... 300	30 ... 270	5
0 ... 400	50 ... 350	5
0 ... 500	50 ... 450	5

Scale range in °F	Measuring range ¹⁾ in °F	Scale spacing in °F
-80 ... +120	-40 ... +100	2
-80 ... +240	-50 ... +210	2
-20 ... +120	0 ... 100	2
0 ... 200	20 ... 180	2
0 ... 250	30 ... 220	2
30 ... 300	60 ... 270	5
30 ... 400	80 ... 350	5
50 ... 300	80 ... 270	5
50 ... 400	100 ... 350	5
100 ... 800	200 ... 700	5
200 ... 700	250 ... 650	5
200 ... 1.000	300 ... 900	5

1) The measuring range is indicated on the dial by two triangular marks.
 Only within this range is the stated error limit valid per EN 13190.

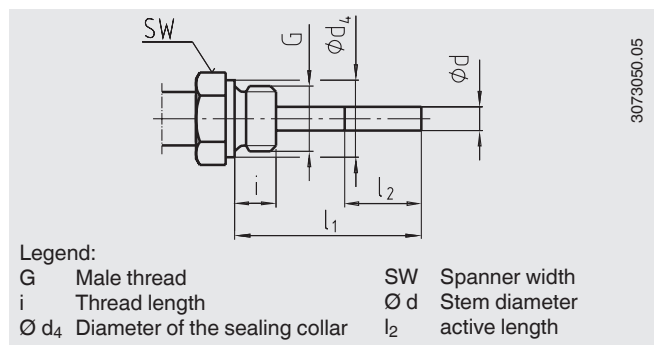
Connection designs

Design standard (male thread connection) ²⁾

Standard insertion length $l_1 = 100, 160, 200, 250$ mm

Nominal size	Process connection		Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$
63, 80, 100, 160	G 1/2 B	14	27	26	8
	G 3/4 B	16	32	32	8
	1/2 NPT	19	22	-	8
	3/4 NPT	20	30	-	8

1) Not for version "adjustable stem and dial"

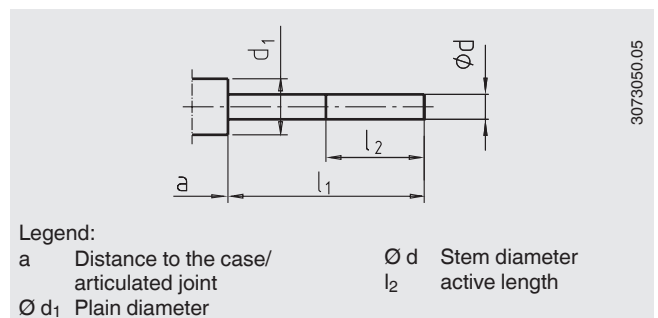


Design 1, plain stem (without thread)

Standard insertion lengths $l_1 = 100, 140, 160, 200, 240, 290$ mm

Basis for design 4, compression fitting

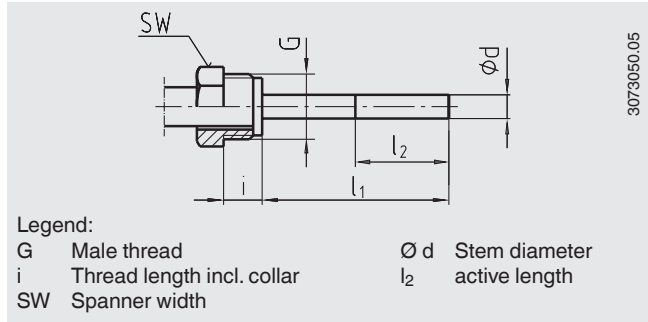
Nominal size	Dimensions in mm			
	d_1	$\varnothing d$	a for axial	a for adjustable stem and dial
63, 80, 100, 160	18	8	15	25



Design 2, male nut

Standard insertion length $l_1 = 140, 180, 230$ mm

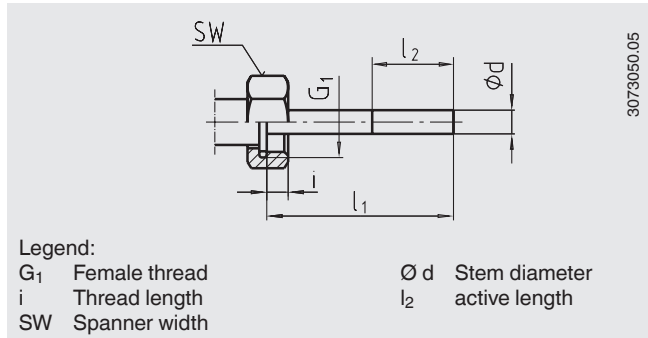
Nominal size	Process connection		Dimensions in mm	
NS	G	i	SW	$\varnothing d$
63, 80, 100, 160	G 1/2 B	20	27	8
	M18 x 1.5	12	24	8



Design 3, union nut

Standard insertion length $l_1 = 126, 186, 226, 276$ mm

Nominal size	Process connection		Dimensions in mm	
NS	G	i	SW	$\varnothing d$
63, 80, 100, 160	G 1/2 B	8,5	27	8
	G 3/4 B	10.5	32	8
	M24 x 1.5	13.5	32	8

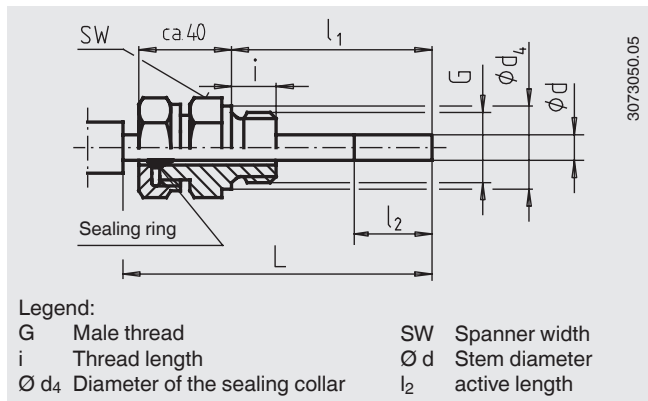


Design 4, compression fitting (sliding on stem)

Insertion length $l_1 =$ variable

Length $L = l_1 + 40$ mm

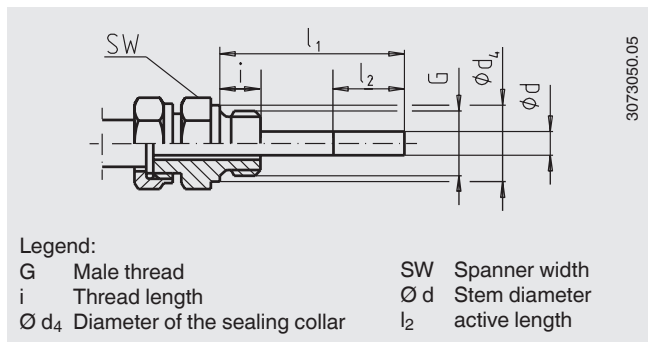
Nominal size	Process connection		Dimensions in mm		
NS	G	i	SW	d_4	$\varnothing d$
63, 80, 100, 160	G 1/2 B	14	27	26	8
	G 3/4 B	16	32	32	8
	1/2 NPT	19	22	-	8
	3/4 NPT	20	30	-	8



Design 5, union nut and fitting

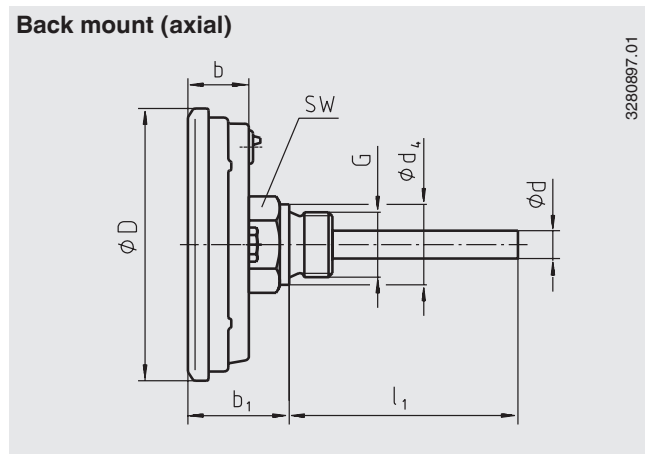
Standard insertion length $l_1 = 100, 160, 200, 250$ mm

Nominal size	Process connection		Dimensions in mm		
NS	G	i	SW	d_4	$\varnothing d$
63, 80, 100, 160	G 1/2 B	14	27	26	8
	G 3/4 B	16	32	32	8
	1/2 NPT	19	22	-	8
	3/4 NPT	20	30	-	8



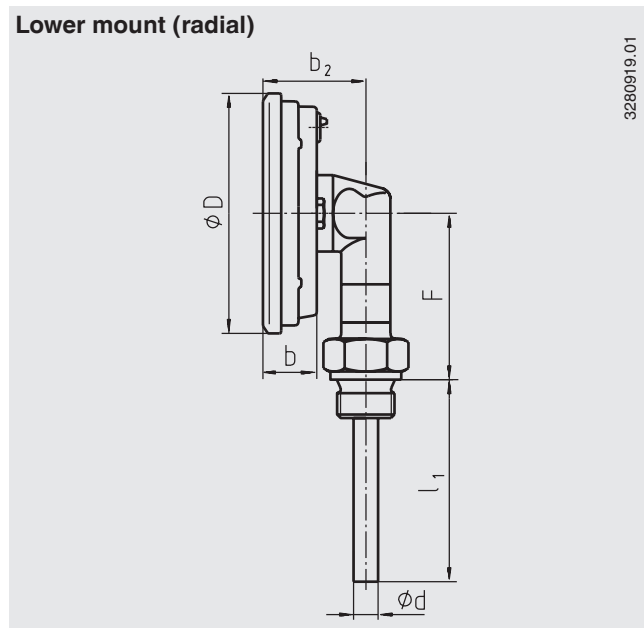
Dimensions in mm

Back mount (axial)



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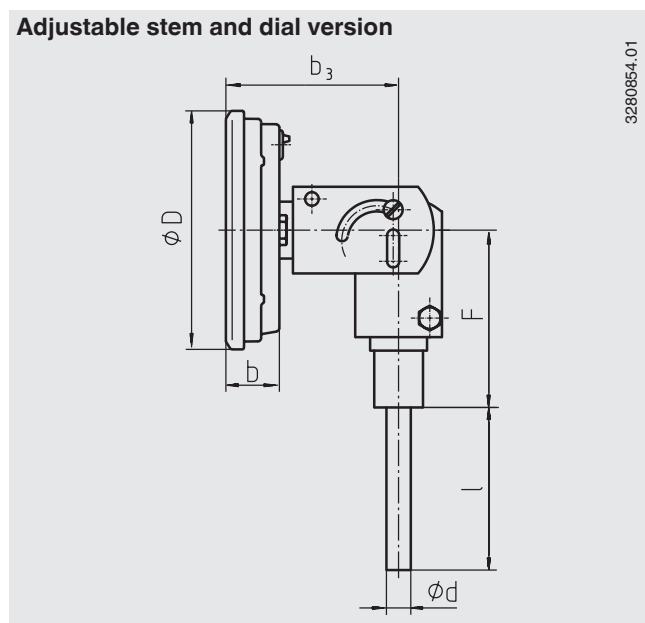
Lower mount (radial)



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NS	Dimensions in mm							Weight in kg	
	b	b ₁ ¹⁾	b ₂	Ø D	Ø d	Ø d ₄	F ¹⁾	R	U
63	20	35	38	68	8 ²⁾	26	47	0.20	0.30
80	20	35	38	77	8 ²⁾	26	56	0.25	0.35
100	22	37	40	107	8 ²⁾	26	66	0.35	0.45
160	25	40	43	161	8 ²⁾	26	96	0.50	0.60

Adjustable stem and dial version



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NS	Dimensions in mm					Weight in kg
	b	b ₃	Ø D	Ø d	F	
63	20	63	68	8 ²⁾	66	0.35
80	20	63	77	8 ²⁾	66	0.40
100	22	65	107	8 ²⁾	66	0.50
160	25	68	161	8 ²⁾	66	0.65

1) With scale ranges $\geq 0 \dots 300$ °C the dimensions increase by 40 mm
 2) Option: Stem Ø 6, 10 mm

R Back mount (BM)
 U Lower mount (LM)









Thermowell

In principle, the operation of a mechanical thermometer without a thermowell with low process-side loading (low pressure, low viscosity and low flow velocities) is possible.

However, in order to enable exchanging the thermometer during operation (e.g. instrument replacement or calibration) and to ensure a better protection of the instrument and also the plant and the environment, it is advisable to use a thermowell from the extensive WIKA thermowell portfolio.

For further information on the calculation for the thermowell, see Technical information IN 00.15.

Approvals

Logo	Description	Country
	EU declaration of conformity ATEX directive (option) Hazardous areas	European Union
	EAC (option) ■ Import certificate ■ Permission for commissioning ■ Hazardous areas	Eurasian Economic Community
	GOST (option) Metrology, measurement technology	Russia
	KazInMetr (option) Metrology, measurement technology	Kazakhstan
-	MTSCHS (option) Permission for commissioning	Kazakhstan
	BelGIM (option) Metrology, measurement technology	Belarus
	UkrSEPRO (option) Metrology, measurement technology	Ukraine
	Uzstandard (option) Metrology, measurement technology	Uzbekistan
	DNV GL (option) ■ Ships, shipbuilding (e.g. offshore) ■ Hazardous areas	International
-	CRN (option) Safety (e.g. electr. safety, overpressure, ...)	Canada

Certificates (options)

- 2.2 Test report
- 3.1 inspection certificate
- DKD/DAkKs calibration certificate

Approvals and certificates, see website

Ordering information

Model / Nominal size / Scale range / Connection design / Connector size / Insertion length l_1 / Options

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