Bimetal thermometer
Model 54, industrial series

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
- Germanischer Lloyd approval (option)

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

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 (IP 65) 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.

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 L_1
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
IP 65 per EN 60529 / IEC 60529

Options

- Scale range °F, °C/°F (dual scale)
- Liquid damping up to max. 250 °C (at the sensor)
- 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 IP 66
- Thermometer with electrical output signal (data sheet TV 15.01)
- Special measuring ranges or dial printing to customer specifications (on request)
- Version per ATEX Ex II 2 GD c TX, see marking on the instrument

Scale ranges, measuring ranges [1], error limits (EN 13190)
Scale graduation per WIKA standard

Scale range in °C	Measuring range in °C [1]	Scale spacing in °C	Error limit ±°C
-30 ... +50	-20 ... +40	1	1
-20 ... +60	-10 ... +50	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

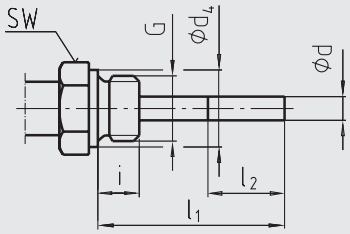
1) The measuring range is indicated on the dial by two triangular marks. Only within this range is the stated error limit valid per EN 13190.

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		
NS	G	i	SW	d_4	Ø d
63, 80, 100, 160	G ½ B	14	27	26	8
	G ¾ B	16	32	32	8
	½ NPT	19	22	-	8
	¾ NPT	20	30	-	8

1) Not for version “adjustable stem and dial”



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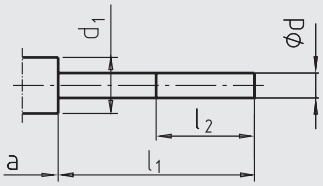
Legend:
G Male thread
i Thread length
Ø d_4 Diameter of the sealing collar
SW Spanner width
Ø d Stem diameter
l_2 active length

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			
NS	d_1	Ød	a for axial	a for adjustable stem and dial
63, 80, 100, 160	18	8	15	25



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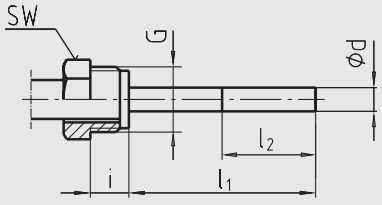
Legend:
a Distance to the case/ articulated joint
Ø d_1 Plain diameter
Ø d Stem diameter
l_2 active length

Design 2, male nut
Standard insertion length l_1 = 140, 180, 230 mm

Nominal size	Process connection		Dimensions in mm	
NS	G	i	SW	Ø d
63, 80, 100, 160	G ½ B	20	27	8
	M18 x 1.5	12	24	8



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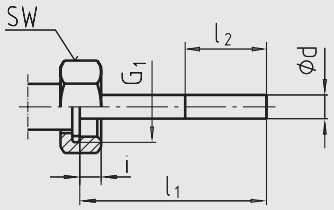
Legend:
G Male thread
i Thread length incl. collar
SW Spanner width
Ø d Stem diameter
l_2 active length

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	Ø d
63, 80, 100, 160	G ½ B	8,5	27	8
	G ¾ B	10,5	32	8
	M24 x 1,5	13,5	32	8



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Legend:

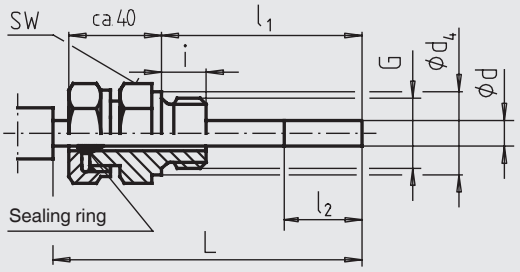
G_1	Female thread	Ø d	Stem diameter
i	Thread length	l_2	active length
SW	Spanner width		

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	Ø d
63, 80, 100, 160	G ½ B	14	27	26	8
	G ¾ B	16	32	32	8
	½ NPT	19	22	-	8
	¾ NPT	20	30	-	8



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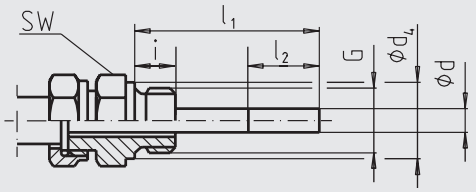
Legend:

G	Male thread	SW	Spanner width
i	Thread length	Ø d	Stem diameter
Ø d_4	Diameter of the sealing collar	l_2	active length

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	Ø d
63, 80, 100, 160	G ½ B	14	27	26	8
	G ¾ B	16	32	32	8
	½ NPT	19	22	-	8
	¾ NPT	20	30	-	8



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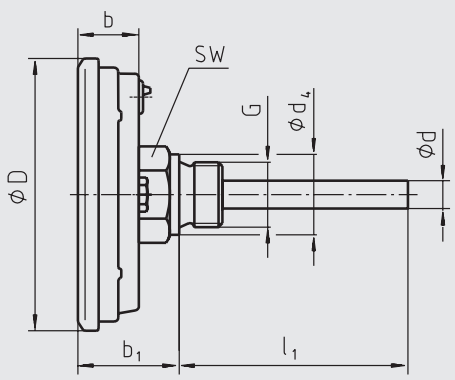
Legend:

G	Male thread	SW	Spanner width
i	Thread length	Ø d	Stem diameter
Ø d_4	Diameter of the sealing collar	l_2	active length

Dimensions in mm

Back mount (axial)



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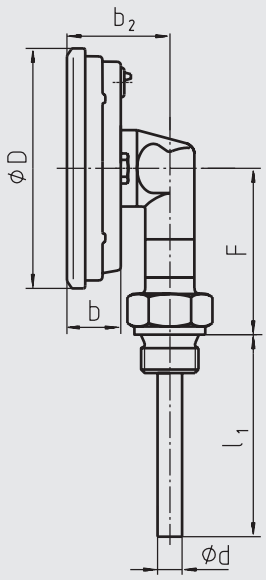
Lower mount (radial)



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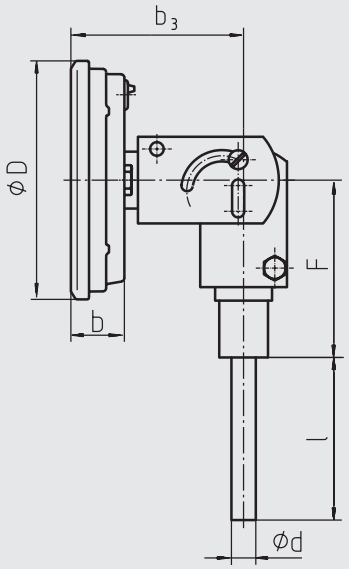
NS	Dimensions in mm							Weight in kg	
	b	b_1 1)	b_2	Ø D	Ø d	Ø d_4	F 1)	R	U
63	20	35	38	68	8 2)	26	47	0.20	0.30
80	20	35	38	77	8 2)	26	56	0.25	0.35
100	22	37	40	107	8 2)	26	66	0.35	0.45
160	25	40	43	161	8 2)	26	96	0.50	0.60

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 ≥ 0 ... 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.

CE conformity

ATEX directive (option)
94/9/EC, II 2 GD c TX

Approvals (option)

- **EAC**, import certificate, ignition protection type “c” - constructive safety, customs union Russia/Belarus/ Kazakhstan
- **GOST**, metrology/measurement technology, Russia
- **GL**, ships, shipbuilding (e.g. offshore), Germany
- **CRN**, safety (e.g. electr. safety, overpressure, ...), Canada

Certificates (option)

- 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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