

# Bimetal thermometer

## For the process industry per EN 13190, premium version

### Model 55

WIKA data sheet TM 55.01



for further approvals  
see page 9

#### 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

#### Special features

- Scale ranges from -70 ... +600 °C
- For extreme ambient temperatures
- Maintenance-friendly bayonet case
- Completely from stainless steel
- Individual stem length from 63 ... 1,000 mm

#### Description

The model 55 bimetal thermometer has been developed and is manufactured in accordance with the EN 13190 standard. This high-quality thermometer has been designed especially for the requirements of the process industry. Especially in the chemical and petrochemical, oil and gas, and power engineering industries, the temperature measuring instrument completely manufactured from stainless steel is used successfully.

The model 55 satisfies the high requirements for resistance against aggressive media. As an option, the case can be made from 316L to fulfil the highest requirements.

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



**Fig. left: Bimetal thermometer, model R5502**

**Fig. right: Bimetal thermometer, adjustable stem and dial, model S5550**

When it comes to harsh climatic conditions at the place of use, the model 55 is the right choice, as it can be used at temperatures ranging from -40 °C to +70 °C (optionally also up to -50 °C or -70 °C in the POLARgauge® version).

## Specifications

Version	
<b>Standard</b>	EN 13190
<b>Nominal size</b>	<ul style="list-style-type: none"> <li>■ 63</li> <li>■ 100</li> <li>■ 160</li> </ul>
<b>Window</b>	<ul style="list-style-type: none"> <li>■ Instrument glass</li> <li>■ Window from polycarbonate (NS 63)</li> <li>■ Laminated safety glass, clear non-splintering plastic</li> </ul>
Connection location	
A5525	NS 63 Back mount (axial)
A5500	NS 100 Back mount (axial)
A5501	NS 160 Back mount (axial)
R5526	NS 63 Lower mount (radial)
R5502	NS 100 Lower mount (radial)
R5503	NS 160 Lower mount (radial)
S5550	NS 100 Back mount, adjustable stem and dial
S5551	NS 160 Back mount, adjustable stem and dial
<b>Connection design</b>	→ For drawings, see page 10
S	Standard (male threaded connection)
1	Plain stem (without thread)
2	Male nut
3	Union nut
4	Compression fitting (sliding on stem)
4.1	Compression fitting with support tube sliding on stem
5	Union nut and loose threaded connection
<b>“Adjustable stem and dial” case version</b>	Swivelling 90° and rotatable 360°
<b>Dampening, case filling (option)</b>	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ With silicone oil case filling, up to max. 250 °C (at the probe)</li> </ul>
Material (in contact with the environment)	
Case, bayonet ring	<ul style="list-style-type: none"> <li>■ Stainless steel 304SS</li> <li>■ Stainless steel 316L</li> </ul>
Articulated joint (“adjustable stem and dial”)	Stainless steel

Measuring element	
<b>Type of measuring element</b>	Bimetal coil
<b>Nominal effective range</b>	
Continuous load (1 year)	Measuring range (EN 13190)
Short time (max. 24 h)	Scale range (EN 13190)
<b>Material movement</b>	<ul style="list-style-type: none"> <li>■ Combination of brass and stainless steel</li> <li>■ Completely from stainless steel</li> </ul>

Accuracy specifications	
<b>Accuracy</b>	Class 1 per EN 13190
<b>Zero adjustment (option)</b>	On the rear side of the case, external only for adjustable stem and dial

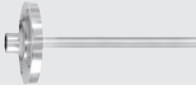

Scale range in °C	Measuring range in °C <sup>1)</sup>	Scale spacing in °C
-70 ... +70	-50 ... +50	2
-70 ... +30	-60 ... +20	1
-50 ... +50	-40 ... +40	1
-50 ... +100	-30 ... +80	2
-50 ... +300	0 ... 250	5
-50 ... +500	0 ... 450	5
-40 ... +60	-30 ... +50	1
-40 ... +80	-20 ... +60	2
-40 ... +160	-20 ... +140	2
-30 ... +50	-20 ... +40	1
-30 ... +70	-20 ... +60	1
-20 ... +60	-10 ... +50	1
-20 ... +80	-10 ... +70	1
-20 ... +100	0 ... 80	2
-20 ... +120	0 ... 100	2
-20 ... +140	0 ... 120	2
-10 ... +50	0 ... 40	1
0 ... 60	10 ... 50	1
0 ... 80	10 ... 70	1
0 ... 100	10 ... 90	1
0 ... 120	10 ... 110	2
0 ... 150	20 ... 130	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
0 ... 600	100 ... 500	10


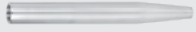


Scale range in °F	Measuring range in °F <sup>1)</sup>	Scale spacing in °F
-80 ... +120	-40 ... +100	2
-80 ... +240	-50 ... +210	2
-20 ... +120	0 ... 100	2
0 ... 200	20 ... 180	2
0 ... 250	30 ... 220	2
30 ... 300	60 ... 270	5
30 ... 400	80 ... 350	5
50 ... 300	80 ... 270	5
50 ... 400	100 ... 350	5
100 ... 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.

Further information on: Scale range		
<b>Unit</b>	<ul style="list-style-type: none"> <li>■ °C</li> <li>■ °F</li> <li>■ °C/°F (dual scale)</li> <li>■ °F/°C (dual scale)</li> </ul>	
<b>Overtemperature stability <sup>1)</sup></b>		
Scale range -70 ... +120 °C	100 % overload safety of scale range	
Scale range 120 ... 280 °C	50 % overload safety of scale range	
Scale range 280 ... 400 °C	Max. 430 °C of scale range	
Scale range 400 ... 600 °C	Max. full scale value	
<b>Dial</b>		
Scale graduation	<ul style="list-style-type: none"> <li>■ Single scale</li> <li>■ Dual scale</li> </ul>	
Scale colour	Single scale	Black
	Dual scale	Red
		Others on request
Material	Aluminium	
<b>Pointer</b>		
Version	Instrument pointer with micro adjustment	
Pointer colour	Black	
Material	Aluminium	

1) Overtemperature stability only in non-Ex area

Process connection		
<b>Thread size</b>	<ul style="list-style-type: none"> <li>■ Plain, without thread</li> <li>■ G ½ B</li> <li>■ ½ NPT</li> <li>■ G ½ B female</li> <li>■ ½ NPT female</li> <li>■ M20 x 1.5</li> <li>■ M24 x 1.5 female</li> </ul> Others on request	
<b>Material (wetted)</b>	Stainless steel 316SS	
<b>Stem</b>		
Diameter	<ul style="list-style-type: none"> <li>■ 8 mm</li> <li>■ 6 mm</li> <li>■ 10 mm</li> <li>■ 12 mm</li> </ul>	
Material (wetted)	Stainless steel 316SS	
<b>Thermowell/protection tube</b>	<p>In principle, the operation of a mechanical thermometer is possible without a thermowell/protection tube with low process-side loading (low pressure, low viscosity and low flow velocities).</p> <p>However, in order to enable exchanging the thermometer during operation (e.g. instrument replacement or calibration) and to ensure a better protection of the measuring instrument and also the plant and the environment, it is advisable to use a thermowell/protection tube from the extensive WIKA portfolio.</p> <p>→ For further information on the wake frequency calculation, see Technical information IN 00.15.</p>	
Model TW10		<ul style="list-style-type: none"> <li>→ see data sheet TW 95.10</li> <li>→ see data sheet TW 95.11</li> <li>→ see data sheet TW 95.12</li> </ul>
Model TW15		→ see data sheet TW 95.15

Process connection		
Model TW20		→ see data sheet TW 95.20
Model TW25		→ see data sheet TW 95.25
Model TW30		→ see data sheet TW 95.30
ScrutonWell® design		→ see data sheet SP 05.16

Operating conditions	
<b>Ambient temperature range (on case)</b>	<ul style="list-style-type: none"> <li>■ -40 ... +70 °C (with/without fill fluid)</li> <li>■ -50 ... +70 °C</li> <li>■ -70 ... +60 °C ( <b>POLARGauge</b>® version)</li> </ul>
<b>Storage temperature range</b>	-50 ... +70 °C
<b>Max. operating pressure at the stem</b>	Max. 25 bar, static
<b>Ingress protection (IP code) per IEC/EN 60529</b>	<ul style="list-style-type: none"> <li>■ IP65</li> <li>■ IP66</li> <li>■ IP67</li> </ul>

Minimum insertion length in mm						
Design	1 and 2			3, 4, 5 and S		
Stem diameter in mm	6	8	≥ 10	6	8	≥ 10
Scale range in °C						
<b>Model A55 (back mount)</b>						
-70 ... +70	63	63	63	69	63	64
-70 ... +30	63	63	63	82	69	73
-50 ... +50	63	63	63	80	68	73
-50 ... +100	63	63	63	69	63	63
-50 ... +200	63	63	63	78	69	67
-50 ... +300	119	119	119	119	119	119
-50 ... +400	119	119	119	119	119	119
-50 ... +500	119	119	119	119	119	119
-40 ... +40	79	65	63	98	79	79
-40 ... +60	65	63	63	79	72	73
-40 ... +80	63	63	63	80	68	69
-40 ... +160	63	63	63	67	63	63
-30 ... +30	90	72	80	109	91	99
-30 ... +50	69	63	63	88	75	81
-30 ... +70	65	63	63	79	72	71
-20 ... +40	88	70	80	107	89	99
-20 ... +60	68	63	63	87	74	78
-20 ... +80	63	63	63	78	66	68
-20 ... +100	63	63	63	71	63	66
-20 ... +120	63	63	63	67	63	63
-20 ... +140	63	63	63	66	63	63
-10 ... +50	88	70	80	107	89	89
0 ... 60	77	70	80	96	89	89
0 ... 80	68	63	63	87	74	78

Minimum insertion length in mm						
Design	1 and 2			3, 4, 5 and S		
Stem diameter in mm	6	8	≥ 10	6	8	≥ 10
Scale range in °C						
0 ... 100	63	63	63	72	63	67
0 ... 120	63	63	63	69	63	64
0 ... 150	63	63	63	66	63	63
0 ... 160	63	63	63	63	63	63
0 ... 200	63	63	63	63	63	63
0 ... 250	63	63	63	73	69	68
0 ... 300	119	119	119	119	119	119
0 ... 400	119	119	119	119	119	119
0 ... 500	119	119	119	119	119	119
0 ... 600	119	119	119	119	119	119
<b>Model R55 (lower mount)</b>						
-70 ... +70	63	63	63	79	68	65
-70 ... +30	68	63	63	87	69	75
-50 ... +50	63	63	63	82	72	72
-50 ... +100	63	63	63	73	64	63
-50 ... +200	63	63	63	69	63	63
-50 ... +300	119	119	119	119	119	119
-50 ... +400	119	119	119	119	119	119
-50 ... +500	119	119	119	119	119	119
-40 ... +40	72	63	63	91	82	75
-40 ... +60	63	63	63	81	71	71
-40 ... +80	63	63	63	78	69	69
-40 ... +160	63	63	63	75	64	64
-30 ... +30	87	72	72	106	91	91
-30 ... +50	68	63	63	87	75	75
-30 ... +70	63	63	63	81	71	71
-20 ... +40	85	68	68	104	87	87
-20 ... +60	67	63	63	87	74	74
-20 ... +80	63	63	63	78	67	67
-20 ... +100	63	63	63	74	65	65
-20 ... +120	63	63	63	73	64	64
-20 ... +140	63	63	63	74	64	67
-10 ... +50	85	68	68	104	87	87
0 ... 60	77	67	67	96	86	86
0 ... 80	67	63	63	86	74	74
0 ... 100	63	63	63	78	67	67
0 ... 120	63	63	63	73	65	65
0 ... 150	63	63	63	73	64	64
0 ... 160	63	63	63	74	67	67
0 ... 200	63	63	63	73	63	63
0 ... 250	63	63	63	82	72	72
0 ... 300	119	119	119	119	119	119
0 ... 400	119	119	119	119	119	119
0 ... 500	119	119	119	119	119	119
0 ... 600	119	119	119	119	119	119

Minimum insertion length in mm						
Design	1 and 2			3, 4, 5 and S		
Stem diameter in mm	6	8	≥ 10	6	8	≥ 10
Scale range in °C						
<b>Model S55 (back mount, adjustable stem and dial)</b>						
-70 ... +70	63	63	63	78	67	63
-70 ... +30	75	63	63	94	80	80
-50 ... +50	67	63	63	86	78	78
-50 ... +100	66	63	63	85	76	68
-50 ... +200	67	63	63	86	78	67
-50 ... +300	119	119	119	119	119	119
-50 ... +400	119	119	119	119	119	119
-50 ... +500	119	119	119	119	119	119
-40 ... +40	90	74	63	109	93	74
-40 ... +60	67	63	63	86	78	78
-40 ... +80	63	63	63	80	70	70
-40 ... +160	63	63	63	67	63	63
-30 ... +30	101	77	77	120	96	96
-30 ... +50	78	66	66	96	85	85
-30 ... +70	72	63	63	91	80	80
-20 ... +40	99	80	80	118	99	99
-20 ... +60	77	65	65	96	79	79
-20 ... +80	66	63	63	85	74	74
-20 ... +100	63	63	63	76	68	68
-20 ... +120	63	63	63	73	66	66
-20 ... +140	63	63	63	71	64	64
-10 ... +50	99	80	80	118	99	99
0 ... 60	94	75	74	113	94	94
0 ... 80	77	65	65	96	79	79
0 ... 100	63	63	63	82	73	73
0 ... 120	63	63	63	75	67	67
0 ... 150	63	63	63	71	64	64
0 ... 160	63	63	63	66	63	63
0 ... 200	63	63	63	63	63	63
0 ... 250	66	63	63	85	73	73
0 ... 300	119	119	119	119	119	119
0 ... 400	119	119	119	119	119	119
0 ... 500	119	119	119	119	119	119
0 ... 600	119	119	119	119	119	119

Minimum insertion length in mm						
Design	1 and 2			3, 4, 5 and S		
Stem diameter in mm	6	8	≥ 10	6	8	≥ 10
Scale range in °F						
<b>Model A55 (back mount)</b>						
-100 ... +150	68	63	63	87	76	69
-80 ... +120	63	63	63	82	69	81
-80 ... +240	63	63	63	81	71	67
-40 ... +120	75	63	63	94	81	75
-20 ... +120	71	63	65	90	75	79








Minimum insertion length in mm						
Design	1 and 2			3, 4, 5 and S		
Stem diameter in mm	6	8	≥ 10	6	8	≥ 10
Scale range in °F						
0 ... 140	68	63	63	87	74	78
0 ... 200	63	63	63	72	63	69
0 ... 250	63	63	63	66	63	69
30 ... 300	63	63	63	66	63	63
30 ... 400	63	63	63	63	63	63
50 ... 300	63	63	63	65	63	63
50 ... 400	63	63	63	63	63	63
100 ... 800	119	119	119	119	119	119
150 ... 750	119	119	119	119	119	119
200 ... 700	119	119	119	119	119	119
200 ... 1,000	119	119	119	119	119	119
<b>Model R55 (lower mount)</b>						
-100 ... +150	75	63	63	94	80	80
-80 ... +120	68	63	63	87	75	75
-80 ... +240	63	63	63	81	71	71
-40 ... +120	71	63	63	90	79	79
-20 ... +120	69	63	63	88	76	74
0 ... 140	67	63	63	86	74	74
0 ... 200	63	63	63	75	66	66
0 ... 250	63	63	63	74	65	65
30 ... 300	63	63	63	74	66	66
30 ... 400	63	63	63	73	63	63
50 ... 300	63	63	63	74	64	64
50 ... 400	63	63	63	75	63	63
100 ... 800	119	119	119	119	119	119
150 ... 750	119	119	119	119	119	119
200 ... 700	119	119	119	119	119	119
200 ... 1,000	119	119	119	119	119	119
<b>Model S55 (back mount, adjustable stem and dial)</b>						
-100 ... +150	71	63	63	90	80	74
-80 ... +120	81	66	66	100	85	85
-80 ... +240	63	63	63	81	71	71
-40 ... +120	85	72	66	104	91	85
-20 ... +120	74	63	65	93	75	79
0 ... 140	77	65	65	96	79	79
0 ... 200	63	63	63	73	65	69
0 ... 250	63	63	63	72	64	64
30 ... 300	63	63	63	73	65	65
30 ... 400	63	63	63	64	63	63
50 ... 300	63	63	63	74	66	66
50 ... 400	63	63	63	65	63	63
100 ... 800	119	119	119	119	119	119
150 ... 750	119	119	119	119	119	119
200 ... 700	119	119	119	119	119	119
200 ... 1,000	119	119	119	119	119	119

The technical feasibility of minimum insertion lengths in conjunction with capillary > 15 m should be tested beforehand.



## Approvals

### Optional approvals

Logo	Description	Country
	<b>EU declaration of conformity</b> ATEX directive Hazardous areas Zone 1 gas II 2G c TX X Zone 21 dust II 2D c TX X	European Union
	<b>EAC</b> EMC directive Low voltage directive Hazardous areas Zone 1 gas II Gb IIC T6 ... T1 X* Zone 21 dust III Db T65 ... T360°C X*	Eurasian Economic Community
	<b>GOST</b> Metrology, measurement technology	Russia
	<b>KazInMetr</b> Metrology, measurement technology	Kazakhstan
-	<b>MTSCHS</b> Permission for commissioning	Kazakhstan
	<b>BelGIM</b> Metrology, measurement technology	Belarus
	<b>UkrSEPRO</b> Metrology, measurement technology	Ukraine
	<b>Uzstandard</b> Metrology, measurement technology	Uzbekistan
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...)	Canada

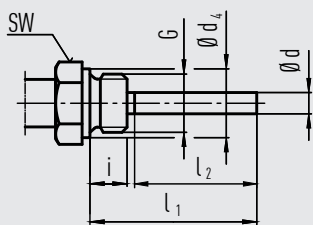
## Certificates (option)

Certificates	
<b>Certificates</b>	<ul style="list-style-type: none"> <li>■ 2.2 test report</li> <li>■ 3.1 inspection certificate</li> </ul>
<b>Calibration</b>	DKD/DAkkS calibration certificate

Approvals and certificates, see website

## Connection designs

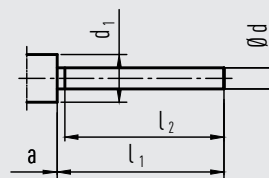
### Standard design (male thread connection)



Connection, male: G ½ B, G ¾ B, ½ NPT, ¾ NPT  
 Standard insertion length  $l_1 = 63, 100, 160, 200, 250$  mm

Nominal size	Process connection		Dimensions in mm		
	G	i	SW	d <sub>4</sub>	Ø d
63, 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

### Design 1, plain stem (without thread)

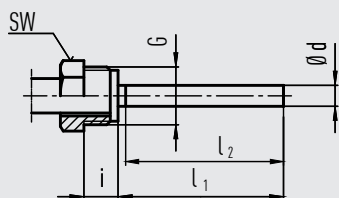


Standard insertion length  $l_1 = 140, 200, 240, 290$  mm  
 Basis for design 4, compression fitting

Nominal size	Dimensions in mm			
	d <sub>1</sub>	Ø d	a for axial	a for adjustable stem and dial
63	14	8	15	25
100, 160	18	8	15	25

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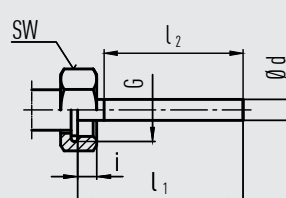
### Design 2, male nut



Standard insertion length  $l_1 = 80, 140, 180, 230$  mm  
 Non-sealing process connection, thus use with thermowell/  
 protection tube.

Nominal size	Process connection		Dimensions in mm	
	G	i	SW	Ø d
63, 100, 160	G ½ B	20	27	8

### Design 3, union nut

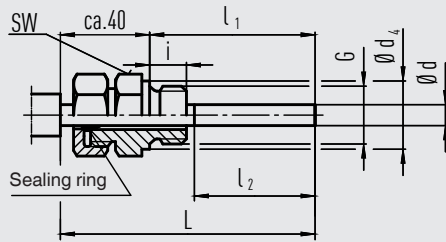


Standard insertion length  $l_1 = 89, 126, 186, 226, 276$  mm

Nominal size	Process connection		Dimensions in mm	
	G	i	SW	Ø d
63, 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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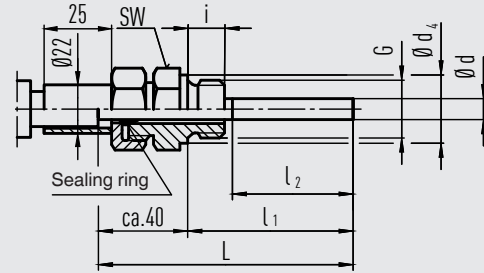
### Design 4, compression fitting (sliding on stem)



Standard insertion length  $l_1 = 63, 100, 160, 200, 250$  mm  
 Length  $L = l_1 + 40$  mm

Nominal size	Process connection		Dimensions in mm		
	G	i	SW	$d_4$	$\varnothing d$
NS 63, 100, 160	G ½ B	14	27	26	8
	G ¾ B	16	32	32	8
	M18 x 1.5	12	24	23	8
	½ NPT	19	22	-	8
	¾ NPT	20	30	-	8

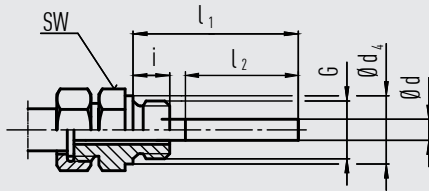
### Design 4.1, compression fitting with support tube sliding on stem



Standard insertion length  $l_1 = 63, 100, 160, 200, 250$  mm  
 Length  $L = l_1 + 40$  mm

Nominal size	Process connection		Dimensions in mm		
	G	i	SW	$d_4$	$\varnothing d$
NS 63, 100, 160	G ½ B	14	27	26	8
	G ¾ B	16	32	32	8
	M18 x 1.5	12	24	23	8
	½ NPT	19	22	-	8
	¾ NPT	20	30	-	8

### Design 5, union nut and loose threaded connection



G ½ B, G ¾ B, M18 x 1.5 and ½ NPT, ¾ NPT  
 Minimum immersion depth  $l_{min}$  approx. 60 mm  
 Insertion length  $l_1 =$  variable  
 Length  $L = l_1 + 40$  mm  
 Stainless steel 1.4571

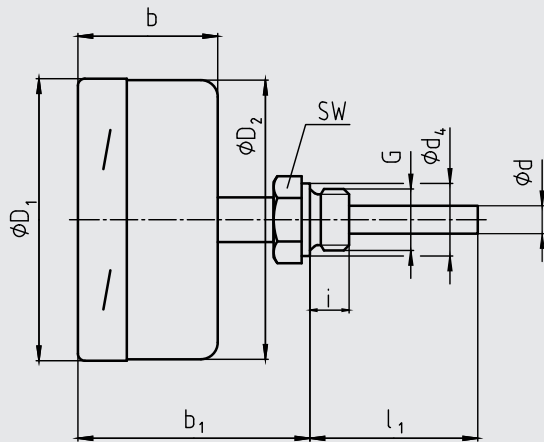
Nominal size	Process connection		Dimensions in mm		
	G	i	SW	$d_4$	$\varnothing d$
NS 63, 100, 160	G ½ B	14	27	26	8
	G ¾ B	16	32	32	8
	M18 x 1.5	12	24	23	8
	½ NPT	19	22	-	8
	¾ NPT	20	30	-	8

#### Legend:

- G Male thread
- G<sub>1</sub> Female thread
- i Thread length (incl. collar)
- a Distance to the case/articulated joint
- $\varnothing d_4$  Diameter of the sealing collar
- SW Spanner width
- $\varnothing d$  Stem diameter
- $l_1$  Insertion length
- $l_2$  Active length

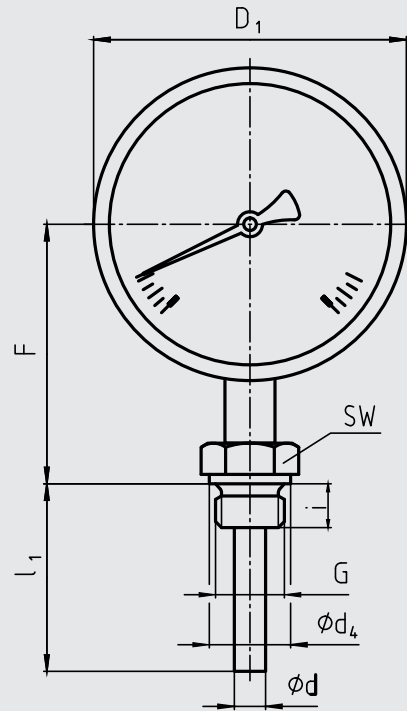
## Dimensions in mm

Back mount



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Lower mount

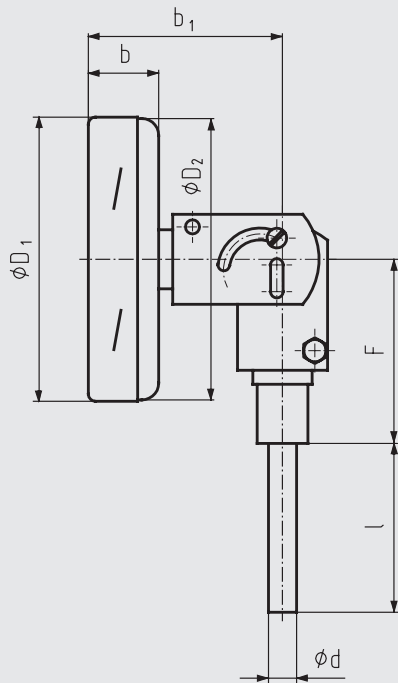


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NS	Dimensions in mm									Weight in kg	
	b	b <sub>1</sub> <sup>1)</sup>	d <sup>2)</sup>	d <sub>4</sub>	Ø D <sub>1</sub>	Ø D <sub>2</sub>	F <sup>1)</sup>	G	SW	Model A55xx	Model R55xx
63	34	60	8	26	64	62	58	G ½ B	27	0.25	0.25
100	50	83	8	26	101	99	83	G ½ B	27	0.8	0.8
160	50	83	8	26	161	159	113	G ½ B	27	1.1	1.1

1) With scale ranges  $\geq 0 \dots 300$  °C the dimensions increase by 40 mm  
 2) Option: Stem Ø 6, 10, 12 mm

## Adjustable stem and dial version



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NS	Dimensions in mm						Weight in kg
	b	b <sub>1</sub>	d <sup>1)</sup>	Ø D <sub>1</sub>	Ø D <sub>2</sub>	F	Model S55xx
100	25	68	8	101	99	68	0.5
160	25	68	8	161	159	68	0.7

1) Option: Stem Ø 6, 10, 12 mm

## Ordering information

Model / Nominal size / Scale range / Connection size / Connection location / Options

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