

Bimetal thermometer

Process version per ASME B40.200

Model TG53

WIKA data sheet TM 53.02



for further approvals
see page 9

Applications

- General process instrumentation in the chemical and petrochemical industries, oil and gas industries, power generation and water/wastewater industries
- Temperature measurement in harsh and aggressive environments
- Suitable for applications with high vibrations

Special features

- Robust, hermetically sealed case
- Accuracy: $\pm 1\%$ of full scale value ASME B40.200 (grade A)
- External reset for reference temperature adjustment
- Dished dial (anti-parallax) for ease of reading
- Adjustable stem and dial version enables optimal process connection



Fig. left: Back mount (axial)

Fig. right: Back mount, adjustable stem and dial

Description

The model TG53 bimetal thermometer has been developed and manufactured in accordance with the ASME B40.200 standard. The thermometer provides high quality and performance, and is an ideal choice in the process industries.

The robust, hermetically sealed case with standard IP66 (NEMA 4X) ingress protection enables use within harsh external conditions.

Specifically designed for use in the chemical and petrochemical, oil and gas, power engineering and shipbuilding industries, the TG53 satisfies the rigorous requirements for resistance to aggressive media. As an available option, the case, stem and process connection can be made from 316 stainless steel.

The TG53 offers the widest variety of dampening options in the industry, allowing it to operate in situations where severe vibration conditions exist. These options include case filling and a dampened packed bearing to minimize pointer oscillation.

An easily accessible reset screw on the back of the case allows quick, limited reference temperature adjustment, reducing maintenance and re-calibration costs.

The TG53 is also available in an assortment of stem lengths (insertion length L_1) to optimize its application-specific fit and performance.

Specifications

Bimetal thermometer, model TG53			
Measuring element	Bimetal coil		
Nominal size in inch [mm]	<ul style="list-style-type: none"> ■ 3" [80 mm] ■ 4" [100 mm] ■ 5" [127 mm] ■ 6" [160 mm] 		
Connection location	<ul style="list-style-type: none"> ■ Back mount (axial) ■ Lower mount (radial) ■ Back mount, adjustable stem and dial 		
Unit (scale range)	<ul style="list-style-type: none"> ■ °F ■ °C Option: <ul style="list-style-type: none"> ■ °F/°C (dual scale) ■ °C/°F (dual scale) 		
Process connection	<ul style="list-style-type: none"> ■ Plain, without thread ■ G ½ B ■ ½ NPT ■ G ½ female ■ ½ NPT female ■ M20 x 1.5 ■ M24 x 1.5 female others on request 		
Accuracy class	Grade A per ASME B40.200		
Stem diameter	<ul style="list-style-type: none"> ■ ¼" [6.35 mm] ■ ⅜" [9.53 mm] 		
Insertion length L ₁	2.5" ... 39" [63 ... 1,000 mm] Other lengths > 39" [1,000 mm] on request Minimum/maximum length is dependent on the measuring range and diameter		
Window	Instrument glass Option: <ul style="list-style-type: none"> ■ Laminated safety glass ■ Polycarbonate (shatterproof) 		
Damping	Without Option: <ul style="list-style-type: none"> ■ With silicone oil case filling, up to max. 482 °F [250 °C] (at the probe) ■ Dampened packed bearing (with inert gel) 		
Versions (option)	<ul style="list-style-type: none"> ■ Oil and grease-free version ■ Silicone-oil-free version 		
Materials			
Case, ring	Stainless steel 304 (option: stainless steel 316L)		
Stem, process connection (wetted)	Stainless steel 304 (option: stainless steel 316L)		
Elbow behind the case	Stainless steel 304 (option: stainless steel 316L), only with lower mount		
Dial	Aluminium, white, black lettering		
Pointer	Aluminium, black, adjustable pointer		
Joint	Stainless steel 304 (option: stainless steel 316L)		
Ingress protection IEC/EN 60529	IP66 (NEMA 4X) Option: <ul style="list-style-type: none"> ■ IP67 ■ IP68 (continuous immersion up to 5 m) 		
Permissible ambient temperature at case	unfilled	filled	Option
Instrument glass	-40 ... +212 °F ¹⁾ [-40 ... +100 °C]	-	-60 ... +160 °F [-50 ... +70 °C]
Laminated and polycarbonate window	-40 ... +160 °F ¹⁾ [-40 ... +70 °C]	-40 ... +160 °F [-40 ... +70 °C]	-60 ... +160 °F [-50 ... +70 °C]

1) For ambient temperatures < 32 °F [0 °C] the measuring system and the window may fog up and possibly ice over.

Bimetal thermometer, model TG53

Temperature limits for storage and transport

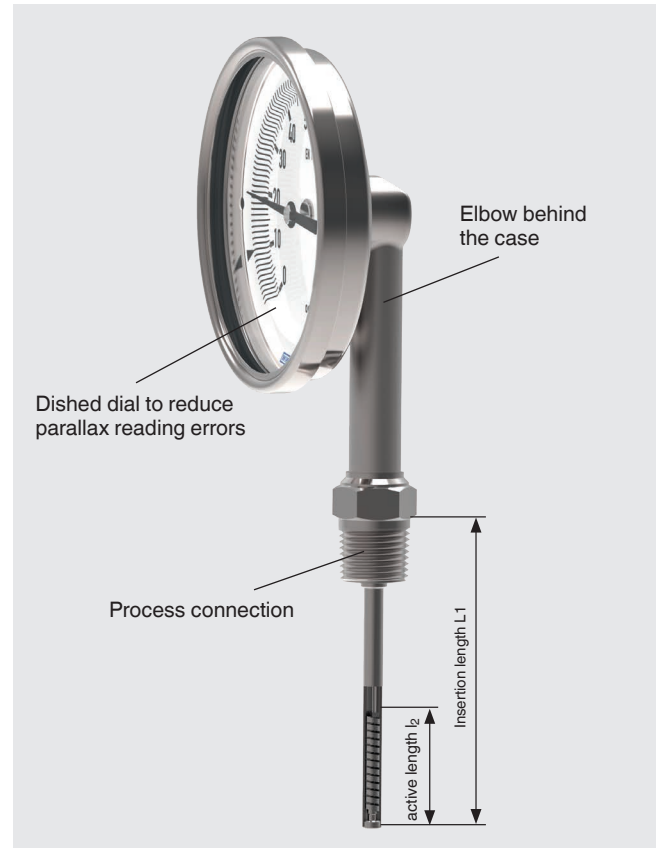
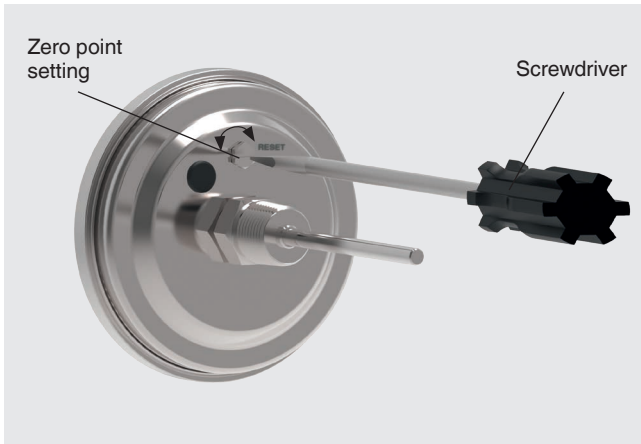
Without liquid damping	-60 ... +160 °F [-50 ... +70 °C]
With liquid damping	-50 ... +160 °F [-40 ... +70 °C]
Option: Dampened pointer	-60 ... +160 °F [-50 ... +70 °C]

Overtemperature stability ²⁾

Scale range -94 ... +250 °F [-70 ... +120 °C]	100 % overload safety of scale range
Scale range 250 ... 550 °F [120 ... 280 °C]	50 % overload safety of scale range
Scale range 550 ... 750 °F [280 ... 400 °C]	max. 800 °F [430 °C] of scale range
Scale range 750 ... 1,000 °F [400 ... 600 °C]	max. full scale value

2) Overtemperature stability only in non-Ex area

Detailed views



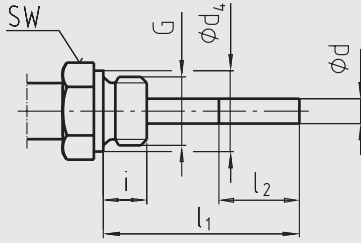
Scale ranges and scale graduation per WIKA factory standard

Scale range in °C	Scale spacing in °C	Standard
-70 ... +70	2	
-70 ... +30	1	●
-60 ... +50	1	
-50 ... +50	1	
-50 ... +100	2	
-50 ... +200	5	
-50 ... +300	5	
-50 ... +400	5	
-50 ... +500	10	
-40 ... +40	1	●
-40 ... +60	1	●
-40 ... +80	2	
-40 ... +160	2	
-30 ... +30	1	●
-30 ... +50	1	●
-30 ... +70	1	●
-20 ... +40	1	●
-20 ... +60	1	
-20 ... +80	1	
-20 ... +100	2	
-20 ... +120	2	●
-20 ... +140	2	
-10 ... +50	1	
0 ... 60	1	●
0 ... 80	1	●
0 ... 100	1	●
0 ... 120	2	●
0 ... 150	2	●
0 ... 160	2	●
0 ... 200	2	●
0 ... 250	5	●
0 ... 300	5	●
0 ... 400	5	
0 ... 500	5	
0 ... 600	5	

Scale range in °F	Scale spacing in °F	Standard
-100 ... +150	5	●
-80 ... +120	2	
-80 ... +240	5	
-40 ... +120	2	
0 ... 140	2	●
0 ... 200	2	
0 ... 250	5	●
30 ... 300	2	●
30 ... 400	5	
50 ... 400	5	●
100 ... 800	10	
150 ... 750	5	●
200 ... 1,000	10	

Connection designs

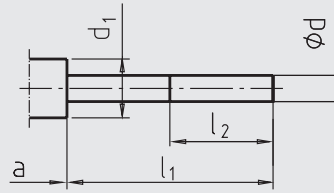
Standard design (male thread connection)



Connection, male: ¼ NPT, ½ NPT, G ¼ B, G ½ B
 Standard insertion length $l_1 = 2.5", 4", 6", 9", 12", 15", 18", 24"$
 Recommendation: For applications with vibration on the process side

Nominal size	Process connection		Dimensions in mm / inch		
NS	G	i	SW	d ₄	Ø d
3", 4", 5", 6"	G ½ B	14	27	26	¼" or ⅜"
	½ NPT	19	22	-	¼" or ⅜"

Design 1, plain stem (without thread)

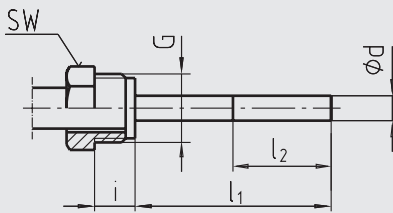


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Standard insertion length $l_1 = 6", 7", 9", 11"$
 Basis for design 4, compression fitting

Nominal size	Dimensions in mm / inch			
NS	d ₁	Ø d	a for axial	a for adjustable stem and dial
3", 4", 5", 6"	18	0.31"	15	25

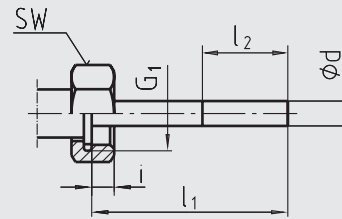
Design 2, male nut



Standard insertion length $l_1 = 3", 5", 7", 9"$
 Non-sealed process connection, thus use with thermowell.

Nominal size	Process connection		Dimensions in mm / inch	
NS	G	i	SW	Ø d
3", 4", 5", 6"	G ½ B	20	27	¼" or ⅜"

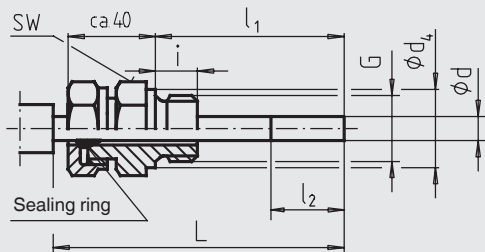
Design 3, union nut



Standard insertion length $l_1 = 4", 5", 7", 9", 10"$

Nominal size	Process connection		Dimensions in mm / inch	
NS	G	i	SW	Ø d
3", 4", 5", 6"	G ½ B	8.5	27	¼" or ⅜"
	M24 x 1.5	13.5	32	¼" or ⅜"

Design 4, compression fitting (sliding on stem)



Insertion length $l_1 = 2.5", 4", 6", 7", 10"$
 Length $L = l_1 + 40$ mm

Nominal size	Process connection		Dimensions in mm / inch		
NS	G	i	SW	d ₄	Ø d
3", 4", 5", 6"	G ½ B	14	27	26	¼" or ⅜"
	½ NPT	19	22	-	¼" or ⅜"

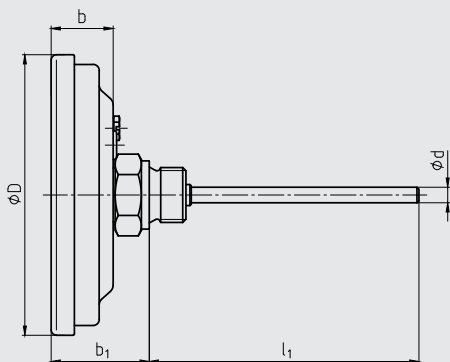
Legend:

- G Male thread
- G₁ Female thread
- i Thread length (incl. collar)
- a Distance to the case/articulated joint
- Ø d₄ Diameter of the sealing collar
- SW Spanner width
- Ø d Stem diameter
- l₂ Active length

Dimensions in mm / inch

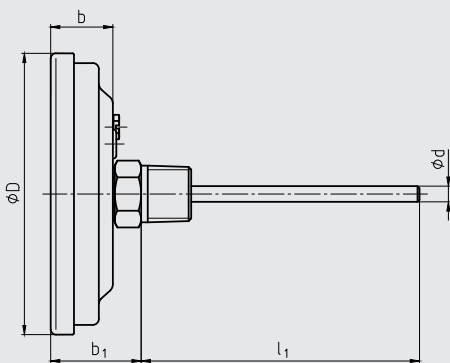
Back mount (axial)

G thread



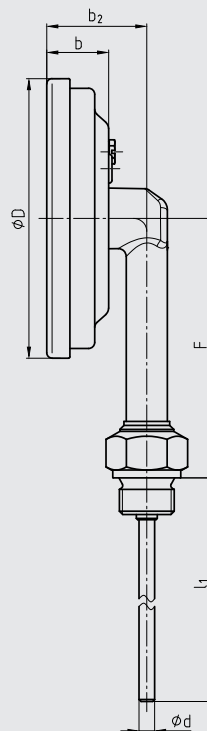
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NPT thread

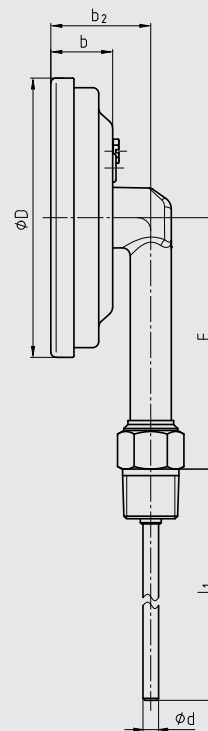


Lower mount (radial)

G thread



NPT thread

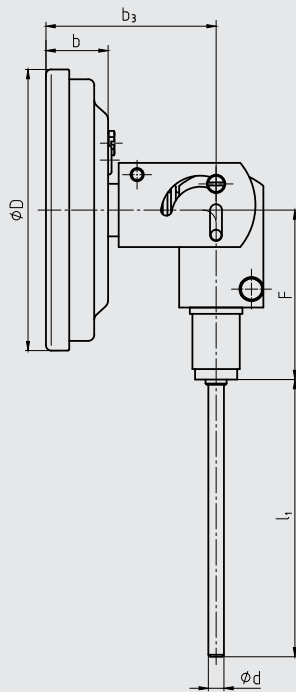


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Nominal size	Dimensions in mm / inch							
	ϕD	ϕd	b	b_1 ¹⁾		b_2	F	
				G thread	NPT thread		G thread	NPT thread
3"	83	1/4" or 3/8"	23	44	37	38	88	84
4"	107	1/4" or 3/8"	24	45	38	39	100	95
5"	134	1/4" or 3/8"	23	44	37	38	113	109
6"	167	1/4" or 3/8"	24	45	38	39	130	125

1) With scale ranges $\geq 0 \dots 300$ °C the dimensions increase by 40 mm

Back mount, adjustable stem and dial



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Nominal size	Dimensions in mm / inch				
NS	$\varnothing D$	$\varnothing d$	b	b_3	F
3"	83	1/4" or 3/8"	23	64	67
4"	107	1/4" or 3/8"	24	65	67
5"	134	1/4" or 3/8"	23	64	67
6"	167	1/4" or 3/8"	24	65	67

Thermowell

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

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 from the extensive WIKA thermowell portfolio.

For further information on the wake frequency calculation, see Technical information IN 00.15.

Common thermowells for mechanical thermometers

Thermowell with flange (solid-machined), model TW10

Data sheets: TW 95.10, TW 95.11, TW 95.12



Threaded thermowell (solid-machined), model TW15

Data sheet: TW 95.15



Weld-in thermowell (solid-machined), socket-weld design, model TW20

Data sheet: TW 95.20



Weld-in thermowell (solid-machined), model TW25

Data sheet: TW 95.25



Thermowell for lap flanges (solid-machined), Vanstone design, model TW30

Data sheet: TW 95.30









Thermowell in ScrutonWell® design

Data sheet: SP 05.16



Special thermowells on request

Approvals

Logo	Description	Country
	EU declaration of conformity (option) ATEX directive Hazardous areas Ignition protection type "c" with instrument category 2G and 2D (marking, see instrument)	European Union
	GOST (option) Metrology, measurement technology	Russia
	KazInMetr (option) Metrology, measurement technology	Kazakhstan
-	MTSCHS (option) Permission for commissioning	Kazakhstan
	BelGIM (option) Metrology, measurement technology	Belarus
	Uzstandard (option) Metrology, measurement technology	Uzbekistan
-	CRN (option) Safety (e.g. electr. safety, overpressure, ...)	Canada
	DNV GL (option) Type approval for the shipbuilding industry - Nominal size: 3" [80 mm], 4" [100 mm] - Damping: with liquid damping - Maximum insertion length: 500 mm Location classification: Humidity DNVGL-CG-0339, section 3, class B Salt mist DNVGL-CG-0339, section 3, class D Vibration DNVGL-CG-0339, section 3, class B Using a thermowell is absolutely necessary.	International

Certificates (option)

- 2.2 test report
- 3.1 inspection certificate with 3 test points (optionally with 5 test points)

Approvals and certificates, see website

Ordering information

Model / Nominal size / Connection location / Connection design / Unit / Scale range / Process connection / Stem diameter / Insertion length l_1 / Approvals / Certificates / Options

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