

Bimetal thermometer

Process version per ASME B40.200

Model TG53

WIKA data sheet TM 53.02



For further approvals
see page 6

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 setting the reference temperature
- 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.

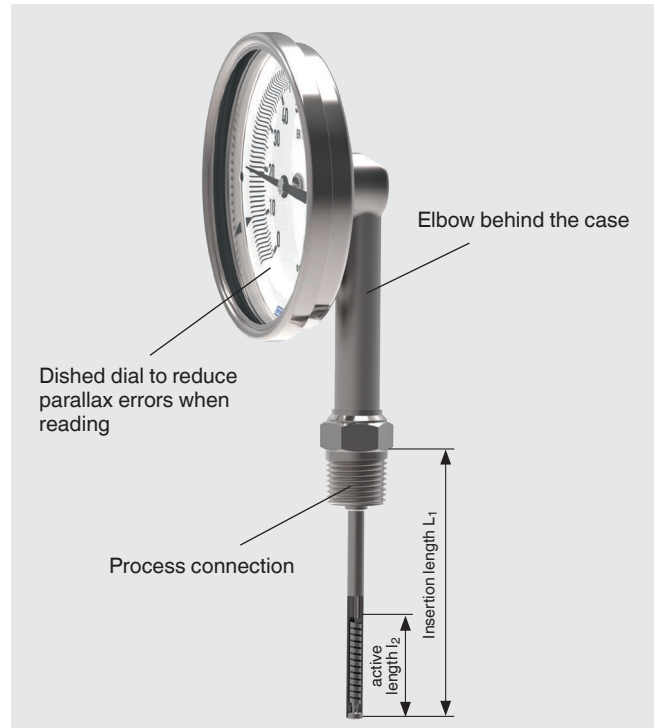
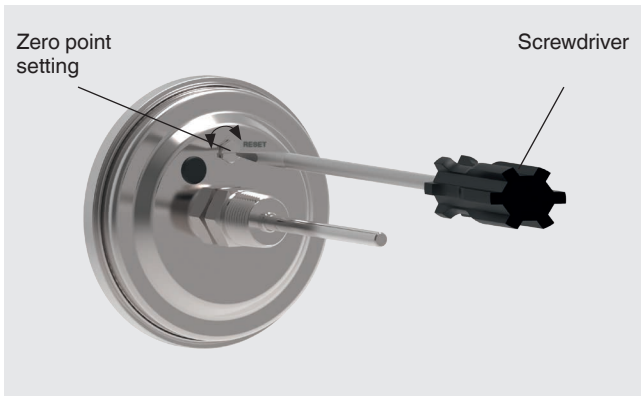
The TG53 offers the widest variety of dampening options in the industry, allowing it to operate in situations where severe vibration conditions exist. These options include case filling and a damped bearing bushing to minimise pointer oscillation.

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

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

Specifications

Detailed views



| Basic information | |
|--|---|
| Standard | ASME B40.200 |
| Nominal size | <ul style="list-style-type: none"> ■ 3" [80 mm] ■ 4" [100 mm] ■ 5" [127 mm] ■ 6" [160 mm] |
| Window | <ul style="list-style-type: none"> ■ Instrument glass ■ Laminated safety glass ■ Polycarbonate (shatterproof) |
| Connection location | <ul style="list-style-type: none"> ■ Back mount (axial) ■ Lower mount (radial) ■ Back mount, adjustable stem and dial |
| Connection design | → For drawings, see page 7 |
| 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 |
| Versions | <ul style="list-style-type: none"> ■ Standard version ■ Oil- and grease-free version ■ Silicone-oil-less version |
| "Adjustable stem and dial" case version | Swivelling 90° and rotatable 360° |
| Dampening, case filling | <ul style="list-style-type: none"> ■ Without ■ With silicone oil case filling, up to max. 482 °F [250 °C] (at the probe) ■ Damped bearing bushing (with inert gel) |

| Basic information | |
|---|--|
| Material (in contact with the environment) | |
| Case, ring | <ul style="list-style-type: none"> ■ Stainless steel 304 ■ Stainless steel 316 |
| Elbow behind the case (only with lower mount) | <ul style="list-style-type: none"> ■ Stainless steel 304 ■ Stainless steel 316 |
| Articulated joint ("adjustable stem and dial") | <ul style="list-style-type: none"> ■ Stainless steel 304 ■ Stainless steel 316 |

| Measuring element | |
|----------------------------------|---|
| Type of measuring element | Bimetal coil |
| Nominal effective range | |
| Continuous load (1 year) | Measuring range |
| Short time (max. 24 h) | → See table „Further details on: scale range“ |

| Accuracy specifications | |
|-------------------------|------------------------------|
| Accuracy | Grade A per ASME B40.200 |
| Zero adjustment | On the rear side of the case |



| Scale range in °C | Scale spacing in °C |
|-------------------|---------------------|
| -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 |


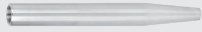


| Scale range in °C | Scale spacing in °C |
|-------------------|---------------------|
| 0 ... 120 | 2 |
| 0 ... 150 | 2 |
| 0 ... 160 | 2 |
| 0 ... 200 | 2 |
| 0 ... 250 | 5 |
| 0 ... 300 | 5 |
| 0 ... 400 | 5 |
| 0 ... 500 | 5 |
| 0 ... 600 | 5 |

| Scale range in °F | Scale spacing in °F |
|-------------------|---------------------|
| -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 |

| Further details on: scale range | | |
|--|--|-------------------|
| Unit | <ul style="list-style-type: none"> ■ °F ■ °C ■ °F/°C (dual scale) ■ °C/°F (dual scale) | |
| Overtemperature resistance ¹⁾ | | |
| End of scale range ≥ 120 °F [50 °C] ... ≤ 250 °F [120 °C] | + 100 % overload safety referred to end of scale range | |
| End of scale range > 250 °F [120 °C] ... ≤ 536 °F [280 °C] | + 50 % overload safety referred to end of scale range | |
| End of scale range > 536 °F [280 °C] ... ≤ 752 °F [400 °C] | Max. 800 °F [430 °C] of end of scale range | |
| End of scale range > 752 °F [400 °C] ... ≤ 1112 °F [600 °C] | Max. full scale range | |
| Dial | | |
| Scale graduation | <ul style="list-style-type: none"> ■ Single scale ■ Dual scale | |
| Scale colour | Single scale | Black |
| | Dual scale | Red |
| | | Others on request |
| Material | Aluminium | |
| Pointer | | |
| Version | Adjustable pointer | |
| Pointer colour | Black | |
| Material | Aluminium | |

1) Overtemperature resistance only in non-hazardous areas

| Process connection | |
|-----------------------------------|---|
| Thread size | <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 <p>Others on request</p> |
| Material (wetted) | <ul style="list-style-type: none"> ■ Stainless steel 304 ■ Stainless steel 316 |
| Stem | |
| Diameter | <ul style="list-style-type: none"> ■ ¼ in [6.35 mm] ■ ⅜ in [9.53 mm] |
| Material (wetted) | Stainless steel 304 (option: stainless steel 316) |
| Thermowell/protection tube | <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 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 |  <p>→ see data sheet TW 95.10</p> |
| Model TW15 |  <p>→ see data sheet TW 95.15</p> |






| 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 | | |
|--|---|--|
| Ambient temperature range (at the case) | Unfilled | Filled |
| Instrument glass | -40 ... +212 °F ¹⁾ [-40 ... +100 °C] | - |
| Laminated and polycarbonate window | -40 ... +160 °F ¹⁾ [-40 ... +70 °C] | <ul style="list-style-type: none"> ■ -40 ... +160 °F [-40 ... +70 °C] ■ -60 ... +160 °F [-50 ... +70 °C] |
| Storage temperature range | | |
| Without liquid dampening | -60 ... +160 °F [-50 ... +70 °C] | |
| With liquid dampening | -50 ... +160 °F [-40 ... +70 °C] | |
| Damped bearing bushing (option) | -60 ... +160 °F [-50 ... +70 °C] | |
| Max. operating pressure at stem | Max. 25 bar, static | |
| Ingress protection (IP code) per IEC/EN 60529 | <ul style="list-style-type: none"> ■ IP66 (NEMA 4X) ■ IP67 ■ IP68 (continuous immersion to 5 m) | |
| Insertion length L₁ | 2.5 ... 39 in [63 ... 1,000 mm] Other lengths > 39 in [1,000 mm] on request Minimum/maximum length is dependent on the measuring range and diameter | |

1) With ambient temperatures < 32 °F [0 °C] the measuring system and the window can fog and possibly even frost up.

Approvals

Optional approvals

| Logo | Description | Country |
|---|--|----------------|
|  | EU declaration of conformity ATEX directive Hazardous areas - Ex h Zone 1 gas II 2G Ex h IIC T6 ... T1 Gb X Zone 20 dust II 2D Ex h IIIC T85 ... T450 °C Db X | European Union |
|  | KazInMetr Metrology, measurement technology | Kazakhstan |
| - | MTSCHS Permission for commissioning | Kazakhstan |
|  | BelGIM Metrology, measurement technology | Belarus |
|  | Uzstandard Metrology, measurement technology | Uzbekistan |
| - | CRN Safety (e.g. electr. safety, overpressure, ...) | Canada |
|  | DNV GL (option) Type approval for the shipbuilding industry - Nominal size: 3" [80 mm], 4" [100 mm] - Dampening: With liquid dampening - Maximum insertion length: 500 mm Location classification: Humidity DNVGL-CG-0339, section 3, class B Salt fog DNVGL-CG-0339, section 3, class D Vibration DNVGL-CG-0339, section 3, class B Use of a thermowell/protection tube is mandatory. | International |

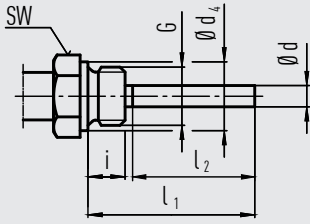
Certificates (option)

| Certificates | |
|--------------|---|
| Certificates | <ul style="list-style-type: none"> ■ 2.2 test report ■ 3.1 inspection certificate |

Approvals and certificates, see website

Connection designs

Standard design (male threaded connection)

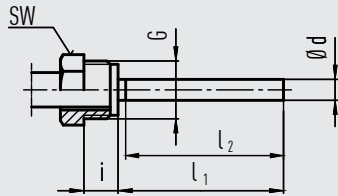


Connection, male: ¼ NPT, ½ NPT, G ¼ B, G ½ B
 Standard insertion length $l_1 = 2.5, 4, 6, 9, 12, 15, 18, 24$ in [63.5, 101.6, 152.4, 228.6, 304.8, 381, 457.2, 609.6]
 Recommendation: For applications with vibration on the process side

| Nominal size | Process connection | Dimensions in in [mm] | | | |
|-----------------------------------|--------------------|-----------------------|--------------|----------------|--------------------------|
| NS in " [mm] | G | i | SW | d ₄ | Ø d |
| 3, 4, 5, 6 [80, 100, 127, 160] | G ½ B | 0.55 [14] | 1.06 [27] | 1.02 [26] | ■ ¼ [6.35] ■ ⅜ [9.53] |
| | ½ NPT | 0.75 [19] | 0.87 [22] | - | ■ ¼ [6.35] ■ ⅜ [9.53] |

Not suitable for use with protection tube inner diameter 0.24 in [6.2 mm] (Tube 0.32 x 0.04 in [8 x 0.9 mm]), Ø 0.32 in [8.2 mm] (Tube 0.39 x 0.04 in [10 x 0.9 mm]) and 0.4 in [10.2 mm] (Tube 0.47 x 0.04 in [12 x 0.9 mm]).

Design 2, male nut



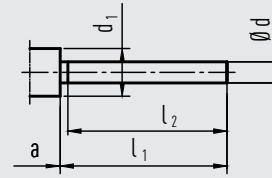
3073050.06

Standard insertion length $l_1 = 3, 5, 7, 9$ in [76.2, 127, 177.8, 228.6 mm]

Non-sealing process connection, thus use with thermowell/protection tube.

| Nominal size | Process connection | Dimensions in inch [mm] | | |
|-----------------------------------|--------------------|-------------------------|-----------|--------------------------|
| NS in " [mm] | G | i | SW | Ø d |
| 3, 4, 5, 6 [80, 100, 127, 160] | G ½ B | 0.79 [20] | 1.06 [27] | ■ ¼ [6.35] ■ ⅜ [9.53] |

Design 1, plain stem (without thread)



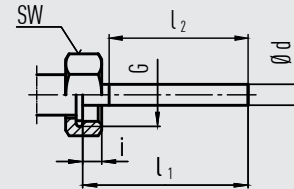
3073050.06

Standard insertion length $l_1 = 6, 7, 9, 11$ in [152.4, 177.8, 228.6, 279.4 mm]

Basis for design 4, compression fitting

| Nominal size | Dimensions in inch [mm] | | | |
|-----------------------------------|-------------------------|----------------|--------------|--------------------------------|
| NS in " [mm] | d ₁ | Ø d | a for axial | a for adjustable stem and dial |
| 3, 4, 5, 6 [80, 100, 127, 160] | 0.71 [18] | 0.31 [7.87] | 0.59 [15] | 0.98 [25] |

Design 3, union nut

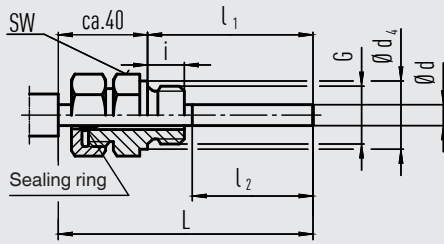


3073050.06

Standard insertion length $l_1 = 4, 5, 7, 9, 10$ in [101.6, 127, 177.8, 228.6, 254 mm]

| Nominal size | Process connection | Dimensions in inch [mm] | | |
|-----------------------------------|--------------------|-------------------------|------------|--------------------------|
| NS in " [mm] | G | i | SW | Ø d |
| 3, 4, 5, 6 [80, 100, 127, 160] | G ½ B | 0.33 [8.5] | 8.5 [215] | ■ ¼ [6.35] ■ ⅜ [9.53] |
| | M24 x 1.5 | 0.53 [13.5] | 13.5 [342] | ■ ¼ [6.35] ■ ⅜ [9.53] |

Design 4, compression fitting (sliding on stem)



Insertion length $l_1 = 2.5, 4, 6, 7, 10$ in [63.5, 101.6, 152.4, 177.8, 254 mm]

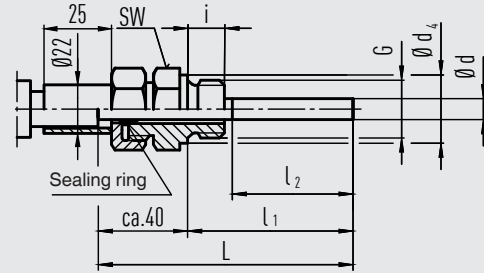
Length $L = l_1 + 1.58$ in [40 mm]

| Nominal size | Process connection | Dimensions in inch [mm] | | | | |
|-----------------------------------|--------------------|-------------------------|--------------|--------------|--------------|------------------------------------|
| | | NS in " [mm] | G | i | SW | d_4 |
| 3, 4, 5, 6 [80, 100, 127, 160] | G 1/2 B | | 0.55 [14] | 1.06 [27] | 1.02 [26] | ■ 1/4 [6.35] ■ 3/8 [9.53] |
| | 1/2 NPT | | 0.75 [19] | 0.87 [22] | - | ■ 1/4 [6.35] ■ 3/8 [9.53] |

Legend:

- G Male 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

Design 4.1, compression fitting with support tube sliding on stem



Insertion length $l_1 = 2.5, 4, 6, 7, 10$ in [63.5, 101.6, 152.4, 177.8, 254 mm]

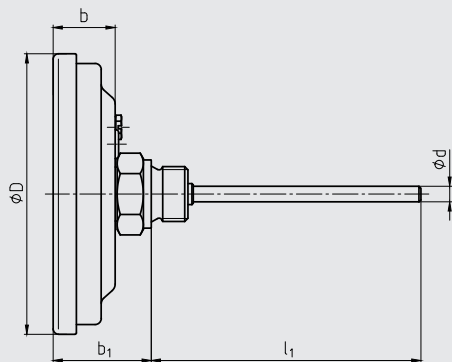
Length $L = l_1 + 1.58$ in [40 mm]

| Nominal size | Process connection | Dimensions in inch [mm] | | | | |
|-----------------------------------|--------------------|-------------------------|--------------|--------------|--------------|------------------------------------|
| | | NS in " [mm] | G | i | SW | d_4 |
| 3, 4, 5, 6 [80, 100, 127, 160] | G 1/2 B | | 0.55 [14] | 1.06 [27] | 1.02 [26] | ■ 1/4 [6.35] ■ 3/8 [9.53] |
| | 1/2 NPT | | 0.75 [19] | 0.87 [22] | - | ■ 1/4 [6.35] ■ 3/8 [9.53] |

Dimensions in inch [mm]

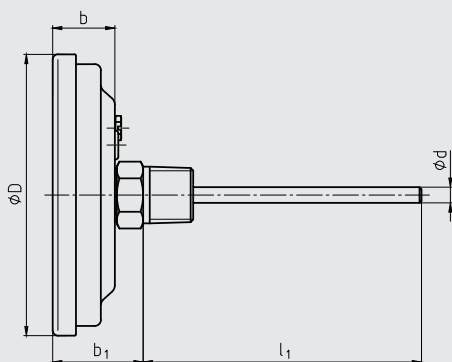
Back mount (axial)

G thread



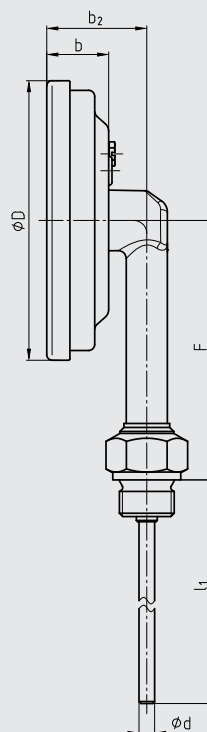
14183333.01

NPT thread

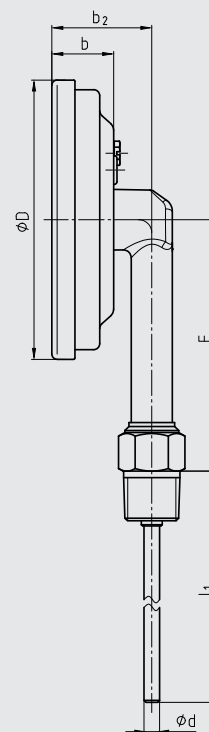


Lower mount (radial)

G thread



NPT thread

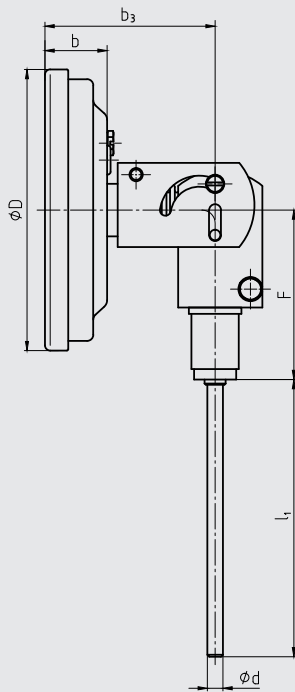


14183334.02

| Nominal size | Dimensions in inch [mm] | | | | | | | |
|----------------|-------------------------|--|-----------|------------------------------|------------|----------------|------------|------------|
| NS in " [mm] | Ø D | Ø d | b | b ₁ ¹⁾ | | b ₂ | F | |
| | | | | G thread | NPT thread | | G thread | NPT thread |
| 3 [80] | 3.27 [83] | <ul style="list-style-type: none"> ■ ¼ [6.35] ■ ⅜ [9.53] | 0.91 [23] | 1.73 [44] | 1.46 [37] | 1.5 [38] | 3.47 [88] | 3.31 [84] |
| 4 [100] | 4.21 [107] | <ul style="list-style-type: none"> ■ ¼ [6.35] ■ ⅜ [9.53] | 0.95 [24] | 1.77 [45] | 1.5 [38] | 1.54 [39] | 3.94 [100] | 3.74 [95] |
| 5 [127] | 5.28 [134] | <ul style="list-style-type: none"> ■ ¼ [6.35] ■ ⅜ [9.53] | 0.91 [23] | 1.73 [44] | 1.46 [37] | 1.5 [38] | 5.12 [113] | 4.29 [109] |
| 6 [160] | 6.58 [167] | <ul style="list-style-type: none"> ■ ¼ [6.35] ■ ⅜ [9.53] | 0.95 [24] | 1.77 [45] | 1.5 [38] | 1.54 [39] | 5.12 [130] | 4.92 [125] |

1) With scale ranges ≥ 0 ... 300 °C the dimensions increase by 1.58 in [40 mm]

Back mount, adjustable stem and dial



14183335.02

| Nominal size | Dimensions in inch [mm] | | | | |
|--------------|-------------------------|------------------------------------|--------------|----------------|--------------|
| NS in " [mm] | Ø D | Ø d | b | b ₃ | F |
| 3 [80] | 3.27 [83] | ■ 1/4 [6.35] ■ 3/8 [9.53] | 0.91 [23] | 2.52 [64] | 2.64 [67] |
| 4 [100] | 4.21 [107] | ■ 1/4 [6.35] ■ 3/8 [9.53] | 0.95 [24] | 2.56 [65] | 2.64 [67] |
| 5 [127] | 5.28 [134] | ■ 1/4 [6.35] ■ 3/8 [9.53] | 0.91 [23] | 2.52 [64] | 2.64 [67] |
| 6 [160] | 6.58 [167] | ■ 1/4 [6.35] ■ 3/8 [9.53] | 0.95 [24] | 2.56 [65] | 2.64 [67] |

Ordering information

Model / Nominal size / Connection location / Connection design / Unit / Scale range / Process connection / Stem diameter / Insertion length I₁ / Approvals / Certificates / Options

© 10/2018 WIKA Alexander Wiegand SE & Co. KG, all rights reserved.
 The specifications given in this document represent the state of engineering at the time of publishing.
 We reserve the right to make modifications to the specifications and materials.
 In case of a different interpretation of the translated and the English data sheet, the English wording shall prevail.

