

Test gauge, copper alloy

Class 0.6, NS 160 [6"]

Model 312.20

WIKA data sheet PM 03.01



For further approvals,
see page Seite 6

Applications

- For gaseous and liquid media that are not highly viscous or crystallising and will not attack copper alloy parts
- High-accuracy pressure measurement
- Testing of industrial type pressure gauges
- Precision measurement in laboratories

Special features

- Knife edge pointer for optimal accuracy of reading
- Precise movement with wear parts of Argantan
- Per EN 837-1 and ASME B40.100
- Accuracy of up to $\pm 0.25\%$ of measuring span (grade 3A)
- Scale ranges from 0 ... 0.6 bar to 0 ... 600 bar [0 ... 10 psi to 0 ... 10,000 psi]



Test gauge, model 312.20

Description

The model 312.20 mechanical test gauge has been specifically designed for the measurement of pressures with high accuracy. With its high accuracy, the Bourdon tube pressure gauge is suitable for testing industrial type pressure gauges or for precision measurement in laboratories.

For the respective measuring requirement, a scale range between 0 ... 0.6 bar and 0 ... 600 bar [0 ... 10 psi and 0 ... 10,000 psi] can be selected.

The model 312.20 is constructed with a case from stainless steel and wetted parts from copper alloy. The instrument meets the requirements of the international industry standard EN 837-1 for Bourdon tube pressure gauges.

The optimal readability of the instrument, with a nominal size of 160 mm [6"], is achieved via a knife edge pointer and a dial with fine divisions. In addition, a mirror band scale can be chosen to avoid the parallax error.

On request, a calibration certificate will be provided for this instrument.

Safe storage and transport is ensured by a transport case (accessory).

Specifications

Basic information	
Standard	<ul style="list-style-type: none"> ■ EN 837-1 ■ ASME B40.100 <p>For information on the "Selection, installation, handling and operation of pressure gauges", see technical information IN 00.05</p>
Nominal size (NS)	Ø 160 mm [6"]
Connection location	<ul style="list-style-type: none"> ■ Lower mount ■ Lower back mount
Window	Instrument glass
Case	Steel, black
Design	<ul style="list-style-type: none"> ■ Safety level "S0" per EN 837 ■ Safety level "S1" per EN 837: With blow-out device in case back
Material	Stainless steel
Ring	<ul style="list-style-type: none"> ■ Bayonet bezel, stainless steel ■ Triangular profile ring, polished stainless steel, with clamp
Mounting	<ul style="list-style-type: none"> ■ Without ■ Surface mounting flange, stainless steel ■ Panel mounting flange, stainless steel ■ Panel mounting flange, polished stainless steel ■ Triangular profile ring with mounting bracket, polished stainless steel ¹⁾ <p>For information on "Mounting types, mounting flanges, panel cutouts", see technical information IN 00.04</p>
Case filling	<ul style="list-style-type: none"> ■ Without ■ With case filling (model 333.50, see data sheet PM 03.06)
Movement	Copper alloy, wear parts Argentan

1) Only for back mount

Measuring element	
Type of measuring element	Bourdon tube, C-type or helical type
Material	
< 100 bar	Copper alloy
≥ 100 bar	Stainless steel 1.4404 (316L)
Leak tightness	<ul style="list-style-type: none"> ■ Leakage rate: < $1 \cdot 10^{-3}$ mbar l/s ■ Helium tested, leakage rate: < $1 \cdot 10^{-6}$ mbar l/s

Accuracy specifications	
Accuracy class	
EN 837-1	<ul style="list-style-type: none"> ■ Class 0.6 ■ Class 0.25 (selectable for scale ranges ≤ 400 bar [6,000 psi])
ASME B40.100	<ul style="list-style-type: none"> ■ ±0.5 % of measuring span (grade A) ■ ±0.25 % of measuring span (grade 3A) (selectable for scale ranges ≤ 400 bar [6,000 psi])
Temperature error	On deviation from the reference conditions at the measuring system: ≤ ±0.4 % per 10 °C [≤ ±0.4 % per 18 °F] of full scale value
Reference conditions	
Ambient temperature	+20 °C [+68 °F]

Scale ranges

mbar	
0 ... 600	0 ... 1,200
0 ... 1,000	0 ... 1,600
0 ... 1,100	0 ... 2,500

bar	
0 ... 0.6	0 ... 30
0 ... 1	0 ... 40
0 ... 1.6	0 ... 60
0 ... 2	0 ... 70
0 ... 2.5	0 ... 100
0 ... 4	0 ... 140
0 ... 6	0 ... 160
0 ... 7	0 ... 200
0 ... 10	0 ... 250
0 ... 14	0 ... 315
0 ... 16	0 ... 400
0 ... 20	0 ... 600
0 ... 25	-

kPa	
0 ... 60	0 ... 2,500
0 ... 70	0 ... 3,000
0 ... 100	0 ... 4,000
0 ... 160	0 ... 6,000
0 ... 200	0 ... 7,000
0 ... 250	0 ... 10,000
0 ... 300	0 ... 14,000
0 ... 400	0 ... 16,000
0 ... 600	0 ... 20,000
0 ... 700	0 ... 25,000
0 ... 1,000	0 ... 31,500
0 ... 1,400	0 ... 40,000
0 ... 1,600	0 ... 60,000

psi	
0 ... 10	0 ... 600
0 ... 15	0 ... 800
0 ... 30	0 ... 1,000
0 ... 60	0 ... 1,500
0 ... 100	0 ... 2,000
0 ... 150	0 ... 3,000
0 ... 160	0 ... 4,000
0 ... 200	0 ... 5,000
0 ... 250	0 ... 6,000
0 ... 300	0 ... 7,500
0 ... 400	0 ... 10,000
0 ... 500	-

kg/cm ²	
0 ... 0.6	0 ... 30
0 ... 1	0 ... 40
0 ... 1.6	0 ... 60
0 ... 2	0 ... 70
0 ... 2.5	0 ... 100
0 ... 4	0 ... 140
0 ... 6	0 ... 160
0 ... 7	0 ... 200
0 ... 10	0 ... 250
0 ... 14	0 ... 315
0 ... 16	0 ... 400
0 ... 20	0 ... 600
0 ... 25	-

MPa	
0 ... 0.06	0 ... 3
0 ... 0.1	0 ... 4
0 ... 0.16	0 ... 6
0 ... 0.2	0 ... 7
0 ... 0.25	0 ... 10
0 ... 0.4	0 ... 14
0 ... 0.6	0 ... 16
0 ... 0.7	0 ... 20
0 ... 1	0 ... 25
0 ... 1.4	0 ... 31.5
0 ... 1.6	0 ... 40
0 ... 2	0 ... 60
0 ... 2.5	-

Vacuum and +/- scale ranges

mbar	
-600 ... 0	-1,000 ... 1,000
-1,000 ... 0	-1,000 ... 1,500
-1,100 ... 0	-1,000 ... 3,000
-1,000 ... 600	-

bar	
-0.6 ... 0	-1 ... +5
-1 ... 0	-1 ... +7
-1 ... +1	-1 ... +10
-1 ... +1.5	-1 ... +15
-1 ... +2	-1 ... +24
-1 ... +3	-1 ... +30
-1 ... +4	-

kPa	
-60 ... 0	-100 ... +500
-100 ... 0	-100 ... +700
-100 ... +60	-100 ... +900
-100 ... +150	-100 ... +1,000
-100 ... +200	-100 ... +1,500
-100 ... +300	-100 ... +2,400
-100 ... +400	-100 ... +3,000

psi	
-15 inHg ... 0	-30 inHg ... +100
-30 inHg ... +0	-30 inHg ... +160
-30 inHg ... +15	-30 inHg ... +200
-30 inHg ... +30	-30 inHg ... +300
-30 inHg ... +60	-

kg/cm ²	
-0.6 ... 0	-1 ... +5
-1 ... 0	-1 ... +7
-1 ... 0.6	-1 ... +9
-1 ... +1	-1 ... +10
-1 ... +1.5	-1 ... +15
-1 ... +2	-1 ... +24
-1 ... +3	-1 ... +30
-1 ... +4	-

MPa	
-0.06 ... 0	-0.1 ... +0.5
-0.1 ... 0	-0.1 ... +0.7
-0.1 ... +0.06	-0.1 ... +0.9
-0.1 ... +0.1	-0.1 ... +1
-0.1 ... +0.15	-0.1 ... +1.5
-0.1 ... +0.2	-0.1 ... +2.4
-0.1 ... +0.3	-0.1 ... +3
-0.1 ... +0.4	-

Further details on: Scale ranges

Special scale ranges	Other scale ranges on request
Unit	<input type="checkbox"/> mbar <input type="checkbox"/> bar <input type="checkbox"/> psi <input type="checkbox"/> kg/cm ² <input type="checkbox"/> kPa <input type="checkbox"/> MPa
Increased overload safety	<input type="checkbox"/> Without <input type="checkbox"/> 1.3 times The possibility of selection depends on the scale range
Vacuum resistance	<input type="checkbox"/> Without <input type="checkbox"/> Vacuum-resistant to -1 bar [-30 inHg] The possibility of selection depends on the scale range

Further details on: Scale ranges	
Dial	
Scale colour	Black
Material	Aluminium
Special scale	Other scales or customer-specific dials, e.g. with red mark, circular arcs or circular sectors, on request
Pointer	Knife edge pointer, aluminium, black
Pointer stop pin	<ul style="list-style-type: none"> ■ Without ■ At 6 o'clock

Process connection		
Standard	<ul style="list-style-type: none"> ■ EN 837-1 ■ ISO 7 ■ ANSI/B1.20.1 	
Size		
EN 837-1	<ul style="list-style-type: none"> ■ G ¼ B, male thread ■ G ½ B, male thread ■ G ¾ B, male thread 	
ISO 7	<ul style="list-style-type: none"> ■ R ¼, male thread ■ R ½, male thread 	
ANSI/B1.20.1	<ul style="list-style-type: none"> ■ ¼ NPT, male thread ■ ½ NPT, male thread 	
Restrictor	<ul style="list-style-type: none"> ■ Without ■ Ø 0.6 mm [0.024"], copper alloy 	
Material (wetted)		
Measuring element	< 100 bar	Copper alloy
	≥ 100 bar	Stainless steel 1.4404 (316L)
Process connection	Copper alloy	

Other process connections on request

Operating conditions	
Medium temperature	<ul style="list-style-type: none"> ■ +80 °C [+176 °F] ■ +100 °C [+212 °F] ■ +200 °C [+392 °F] (only model 332.50, see data sheet PM 03.06)
Ambient temperature	-20 ... +60 °C [-4 ... +140 °F]
Pressure limitation	
Steady	Full scale value
Fluctuating	0.9 x full scale value
Short time	1.3 x full scale value
Ingress protection per IEC/EN 60529	IP54
Adjustment medium	<ul style="list-style-type: none"> ■ Liquid for scale ranges > 25 bar [400 psi]; gas for scale ranges ≤ 25 bar [400 psi] ■ Gas for all scale ranges

Packaging	
Packaging	<ul style="list-style-type: none"> ■ Packaging with increased shock resistance ■ Plastic bag ■ Transport case

Approvals

Logo	Description	Country
CE	EU declaration of conformity	European Union
	Pressure Equipment Directive PS > 200 bar, module A, pressure accessory	
UK CA	UKCA	United Kingdom
	Pressure equipment (safety) regulations	
-	CRN Safety (e.g. electr. safety, overpressure, ...) For scale ranges ≤ 1,000 bar	Canada

Optional approvals

Logo	Description	Country
KG	PAC Kazakhstan Metrology, measurement technology	Kazakhstan
-	MChS Permission for commissioning	Kazakhstan
-	PAC Ukraine Metrology, measurement technology	Ukraine
-	PAC China Metrology, measurement technology	China

Manufacturer's information and certificates

Logo	Description
-	Pressure Equipment Directive (PED) for maximum allowable pressure PS ≤ 200 bar
-	Suitability of wetted materials for drinking water in accordance with the European 4MS initiative

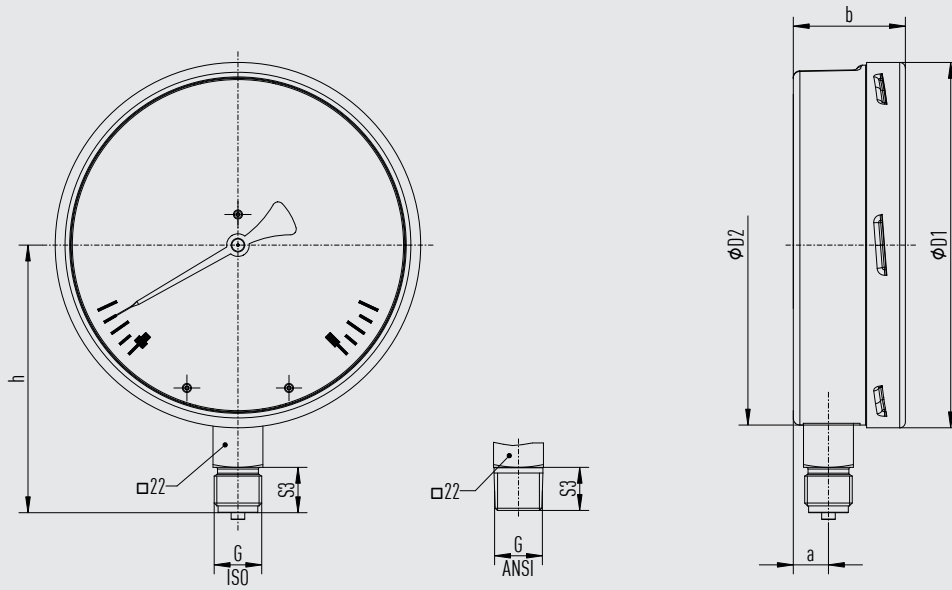
Certificates (option)

Certificates	
Certificates	<ul style="list-style-type: none"> ■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy) ■ 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts, indication accuracy) ■ PCA calibration certificate, traceable and accredited in accordance with ISO/IEC 17025 ■ Calibration certificate by a national accreditation body, traceable and accredited in accordance with ISO/IEC 17025 on request
Recommended calibration interval	1 year (dependent on conditions of use)

→ For approvals and certificates, see website

Dimensions in mm [in]

Lower mount



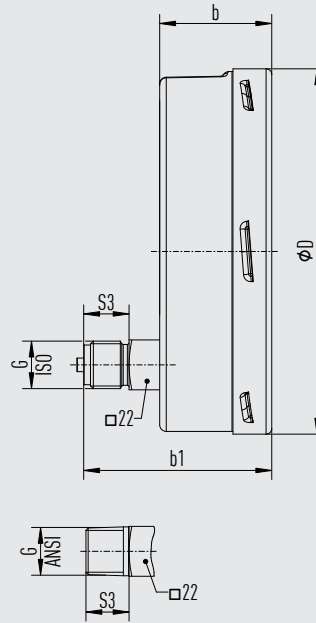
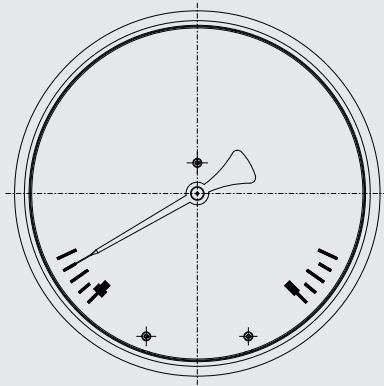
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Weight: Approx. 1.5 kg [4.02 lb]

NS	G	Dimensions in mm [in]					
		$h \pm 1$ [0.04]	S3	a	$b \pm 0.5$ [0.02] ¹⁾	D1	D2
160 [6"]	G ¼ B	111 [4.37]	13 [0.51]	15.5 [0.61]	49.5 [1.95]	161 [6.34]	159 [6.26]
	G ½ B	118 [4.65]	20 [0.79]	15.5 [0.61]	49.5 [1.95]	161 [6.34]	159 [6.26]
	¼ NPT, R ¼	111 [4.37]	13 [0.51]	15.5 [0.61]	49.5 [1.95]	161 [6.34]	159 [6.26]
	½ NPT, R ½	117 [4.61]	19 [0.75]	15.5 [0.61]	49.5 [1.95]	161 [6.34]	159 [6.26]

1) Plus 16 mm [0.630 in] with scale ranges $\geq 0 \dots 100$ bar [$\geq 0 \dots 1,500$ psi]

Lower back mount






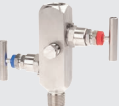



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Weight: Approx. 1.5 kg [4.02 lb]

NS	G	Dimensions in mm [in]			
		$b \pm 0.5 [0.02]^{1)}$	$b1 \pm 1 [0.04]^{1)}$	S3	D
160 [6"]	G ¼ B	49.5 [1.95]	76 [2.99]	13 [0.51]	161 [6.34]
	G ½ B	49.5 [1.95]	83 [3.27]	20 [0.79]	161 [6.34]
	¼ NPT, R ¼	49.5 [1.95]	76 [2.99]	13 [0.51]	161 [6.34]
	½ NPT, R ½	49.5 [1.95]	82 [3.23]	19 [0.75]	161 [6.34]

1) Plus 16 mm [0.630 in] with scale ranges $\geq 0 \dots 100$ bar [$\geq 0 \dots 1,500$ psi]

Accessories and spare parts

Model	Description
	910.17 Seals → See data sheet AC 09.08
	910.15 Syphons → See data sheet AC 09.06
	910.13 Overpressure protector → See data sheet AC 09.04
	IV10, IV11 Needle valve and multiport valve → See data sheet AC 09.22
	IV20, IV21 Block-and-bleed valve → See data sheet AC 09.19
	IVM Monoflange, process and instrument version → See data sheet AC 09.17
	BV Ball valve, process and instrument version → See data sheet AC 09.28
	IBF2, IBF3 Monoblock with flange connection → See data sheet AC 09.25

Ordering information

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

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