Bourdon tube pressure gauge, stainless steel
For the process industry, standard version
Models 232.50, 233.50, NS 63 [2 ½"], 100 [4"] and 160 [6"]

for further approvals
see page 5

Applications

- For gaseous and liquid aggressive media that are not highly viscous or crystallising, also in aggressive environments
- Chemical and petrochemical industries, oil and gas industry, power engineering and also water and wastewater technology
- Machine building and general plant construction

Special features

- Excellent load-cycle stability and shock resistance
- With case filling (model 233.50) for applications with high dynamic pressure loads and vibrations
- Completely from stainless steel
- Scale ranges from 0 … 0.6 to 0 … 1,600 bar [0 ... 10 to 0 ... 20,000 psi]

Bourdon tube pressure gauge, model 232.50, NS 100 [4"]

Description

This high-quality Bourdon tube pressure gauge has been designed especially for the process industry.

The use of high-quality stainless steel materials and the robust design are geared to applications in the chemical and process engineering industries. Thus the instrument is suitable for liquid and gaseous media, also in aggressive environments.

Scale ranges of 0 … 0.6 to 0 … 1,600 bar [0 ... 10 to 0 ... 20,000 psi] ensure the measuring ranges required for a wide variety of applications.

WIKA manufactures and qualifies the pressure gauge in accordance with the standards EN 837-1 and ASME B40.100. This instrument has as safety function a blow-out device with blow-out plug on the back of the case. In the event of a failure, overpressure can escape there.

The model 233.50 with liquid-filled case is suitable for high dynamic pressure loads and vibrations.

Data sheets showing similar products:
Stainless steel, safety version; model 232.30; see data sheet PM 02.04
Bourdon tube pressure gauge with switch contacts; models PGS23.100 and PGS23.160; see data sheet PV 22.02
Pressure gauge per EN 837-1 with mounted diaphragm seal; model DSS27M; see data sheet DS 95.12

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Specifications

Basic information	
Standard	■ EN 837-1 ■ ASME B40.100
	For information on the “Selection, installation, handling and operation of pressure gauges”, see Technical information IN 00.05.
Nominal size (NS)	■ Ø 63 mm [2 ½"] ■ Ø 100 mm [4"] ■ Ø 160 mm [6"]
Window	Laminated safety glass (NS 63 [2 ½"]: Polycarbonate)
Case	Safety level “S1” per EN 837-1 Stainless steel, with blow-out device at case circumference, 12 o'clock (NS 63 [2 ½"]) and on the back of the case (NS 100 [4"] and 160 [6"]) Scale ranges ≤ 0 ... 16 bar [≤ 0 ... 300 psi] with compensating valve to vent and reseal case
Ring	Bayonet ring, stainless steel
Mounting	■ Without ■ Panel mounting flange, stainless steel ■ Panel mounting flange, polished stainless steel ■ Triangular profile ring, stainless steel polished with mounting bracket ■ Surface mounting flange, stainless steel
Case filling (model 233.50)	■ Without ■ Glycerine ■ Glycerine-water mixture for NS 100 [4"] and 160 [6"] with scale range ≤ 0 ... 2.5 bar [≤ 0 ... 40 psi] or for NS 63 [2 ½"] with scale range ≤ 0 ... 4 bar [≤ 0 ... 60 psi] ■ Silicone oil

Measuring element	
Type of measuring element	Bourdon tube, C-type or helical type
Material	■ Stainless steel 316L ■ Monel (models 262.50 and 263.50)
Leak tightness	■ Helium tested, leakage rate: < $5 \cdot 10^{-3}$ mbar l/s ■ Helium tested, leakage rate: < $1 \cdot 10^{-6}$ mbar l/s

Accuracy specifications		
Accuracy class		
NS 63 [2 ½"]	■ EN 837-1	Class 1.6
	■ ASME B40.100	±2 ½ % of measuring span (grade A)
NS 100 [4"], 160 [6"]	■ EN 837-1	Class 1,0
	■ ASME B40.100	±1.0 % of measuring span (grade 1A)
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

Scale range	
bar	**kg/cm²**
0 ... 0.6	0 ... 0.6
0 ... 1	0 ... 1
0 ... 1.6	0 ... 1.6
0 ... 2.5	0 ... 2.5
0 ... 4	0 ... 4
0 ... 6	0 ... 6
0 ... 10	0 ... 10
0 ... 16	0 ... 16
0 ... 25	0 ... 25
0 ... 40	0 ... 40
0 ... 60	0 ... 60
0 ... 100	0 ... 100
0 ... 160	0 ... 160
0 ... 250	0 ... 250
0 ... 400	0 ... 400
0 ... 600	0 ... 600
0 ... 1,000	0 ... 1,000
0 ... 1,600	0 ... 1,600
kPa	**MPa**
0 ... 100	0 ... 0.1
0 ... 160	0 ... 0.16
0 ... 250	0 ... 0.25
0 ... 400	0 ... 0.4
0 ... 600	0 ... 0.6
0 ... 1,000	0 ... 1
0 ... 1,600	0 ... 1.6
0 ... 250	0 ... 2.5
0 ... 400	0 ... 4
0 ... 600	0 ... 6
0 ... 1,000	0 ... 10
0 ... 1,600	0 ... 16
0 ... 2,500	0 ... 25
0 ... 4,000	0 ... 40
0 ... 6,000	0 ... 60
0 ... 10,000	0 ... 100
0 ... 16,000	0 ... 160

Scale range	
psi	**psi**
0 ... 10	0 ... 1,000
0 ... 15	0 ... 1,500
0 ... 30	0 ... 2,000
0 ... 60	0 ... 3,000
0 ... 100	0 ... 4,000
0 ... 160	0 ... 5,000
0 ... 200	0 ... 6,000
0 ... 300	0 ... 7,500
0 ... 400	0 ... 10,000
0 ... 600	0 ... 20,000
0 ... 800	

Vacuum and +/- scale ranges

Scale range	
bar	**MPa**
-0.6 ... 0	-0.06 ... 0
-1 ... 0	-0.1 ... 0
-1 ... +0.6	-0.1 ... +0.06
-1 ... +1.5	-0.1 ... +0.15
-1 ... +3	-0.1 ... +0.3
-1 ... +5	-0.1 ... +0.5
-1 ... +9	-0.1 ... +0.9
-1 ... +15	-0.1 ... +1.5
-1 ... +24	-0.1 ... +2.4
kPa	**psi**
-60 ... 0	-30 inHg ... 0
-100 ... 0	-30 inHg ... +15
-100 ... +60	-30 inHg ... +30
-100 ... +150	-30 inHg ... +60
-100 ... +300	-30 inHg ... +100
-100 ... +500	-30 inHg ... +160
-100 ... +900	-30 inHg ... +200
-100 ... +1,500	-30 inHg ... +300
-100 ... +2,400	

Further information on: Scale ranges	
Special scale ranges	Other scale ranges on request
Unit	■ bar ■ psi ■ kg/cm² ■ kPa ■ MPa

Further information on: Scale ranges		
Dial		
Scale colour	Black	
Material	Aluminium	
Special scale	■ Without ■ With temperature scale for refrigerant, e.g. for NH3: R 717	
	Other scales on request	
Pointer	Aluminium, black	

Process connections	
Standard	■ ISO 1179-2 ■ ISO 7 ■ ANSI/B1.20.1
Size	
ISO 1179-2	■ G ⅛ B, male thread ■ G ¼ B, male thread ■ G ½ B, male thread ■ M12 x 1.5, male thread ■ M20 x 1.5, male thread
ISO 7	■ R ¼, male thread ■ R ½, male thread
ANSI/B1.20.1	■ ¼ NPT, male thread ■ ½ NPT, male thread
Materials (wetted)	
Process connection	■ NS 100 [4"], 160 [6"]: Stainless steel 316L ■ NS 63 [2 ½"]: 316 Ti ■ Monel (models 262.50 and 263.50)
Bourdon tube	■ Stainless steel 316L ■ Monel (models 262.50 and 263.50)

Other process connections on request

Operating conditions		
Medium temperature		
Unfilled instruments	-40 ... +200 °C [-40 ... +392 °F]	
Instruments with glycerine filling	-20 ... +100 °C [-4 ... +212 °F]	
Instruments with silicone oil filling	-40 ... +100 °C [-40 ... +212 °F]	
Ambient temperature		
Unfilled instruments or with silicone oil filling	-40 ... +60 °C [-40 ... +140 °F]	
Instruments with glycerine filling	-20 ... +60 °C [-4 ... +140 °F]	
Pressure limitation		
NS 63 [2 ½"]	Steady	3/4 x full scale value
	Fluctuating	2/3 x full scale value
	Short time	Full scale value
NS 100 [4"], 160 [6"]	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	■ IP65 ■ IP66 (only selectable for scale ranges from 0 ... 20 bar [0 ... 400 psi])	

Approvals

Approvals included in the scope of delivery

Logo	Description	Country
CE	**EU declaration of conformity** Pressure equipment directive PS > 200 bar, module A, pressure accessory	European Union
-	**CRN** Safety (e.g. electr. safety, overpressure, ...) For scale ranges ≤ 1,000 bar	Canada

Optional approvals

Logo	Description	Country
CE Ex	**EU declaration of conformity**	European Union
	ATEX directive Hazardous areas - Ex h Gas [IIC T6 ... T1 Gb X] Dust [IIIC T85° ... T450°C Db X]	
EAC Ex	**EAC**	Eurasian Economic Community
	Hazardous areas	
	GOST Metrology, measurement technology	Russia
	KazInMetr Metrology, measurement technology	Kazakhstan
-	**MTSCHS** Permission for commissioning	Kazakhstan
	BelGIM Metrology, measurement technology	Belarus
	UkrSEPRO Metrology, measurement technology	Ukraine
	Uzstandard Metrology, measurement technology	Uzbekistan
-	**CPA** Metrology, measurement technology	China
	DNV GL Ships, shipbuilding (e.g. offshore)	International

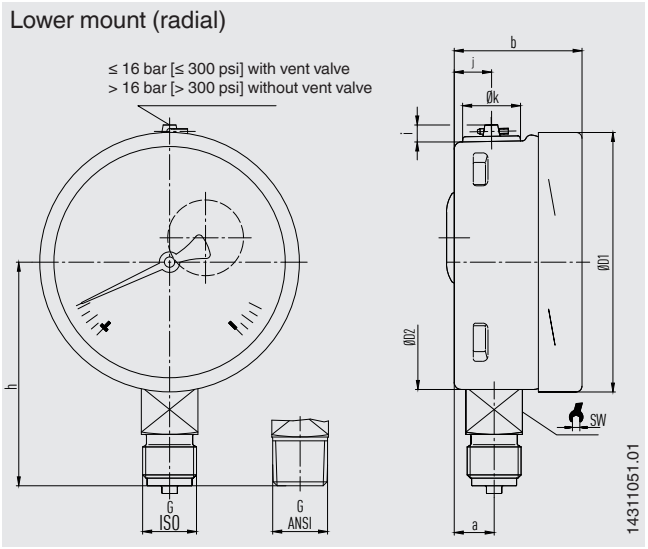
Certificates (option)

Certificates	
Certificates	■ 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. indication accuracy)
Recommended recalibration interval	1 year (dependent on conditions of use)

→ Approvals and certificates, see website

Dimensions in mm [in]

Lower mount (radial)



Process connection with thread per ISO 1179-2

NS	G	Dimensions in mm [in]								
		h ±1	a	b	D1	D2	i	y	k	SW
63 [2 ½"]	G ¼ B	54 [2.13]	9.5 [0.37]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	G ⅛ B	51 [2.01]								
	M12 x 1.5	54 [2.13]								
100 [4"]	G ¼ B	80 [3.15]	15.5 [0.61]	49.5 [1.95]	101 [3.98]	99 [3.90]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	G ½ B	87 [3.43]								
	M12 x 1.5	80 [3.15]								
	M20 x 1.5	87 [3.43]								
160 [6"]	G ¼ B	111 [4.37]	15.5 [0.61]	49.5 [1.95] 1)	161 [6.34]	159 [6.26]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	G ½ B	118 [4.65]								
	M12 x 1.5	111 [4.37]								
	M20 x 1.5	118 [4.65]								

Process connection with thread per ISO 7

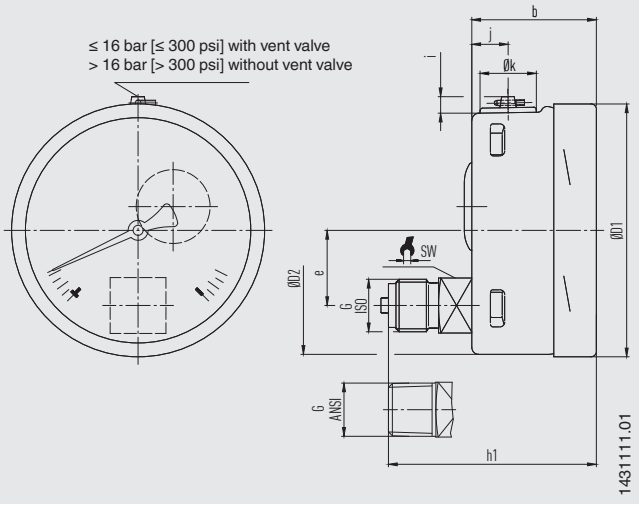
NS	G	Dimensions in mm [in]								
		h ±1	a	b	D1	D2	i	y	k	SW
63 [2 ½"]	R ¼	54 [2.13]	9.5 [0.37]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
100 [4"]	R ¼	80 [3.15]	15.5 [0.61]	49.5 [1.95]	101 [3.98]	99 [3.90]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	R ½	86 [3.39]								
160 [6"]	R ¼	111 [4.37]	15.5 [0.61]	49.5 [1.95] 1)	161 [6.34]	159 [6.26]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	R ½	117 [4.60]								

Process connection with thread per ANSI/B1.20.1

NS	G	Dimensions in mm [in]								
		h ±1	a	b	D1	D2	i	y	k	SW
63 [2 ½"]	¼ NPT	54 [2.13]	9.5 [0.37]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	⅛ NPT	51 [2.01]								
100 [4"]	¼ NPT	80 [3.15]	15.5 [0.61]	49.5 [1.95]	101 [3.98]	99 [3.90]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	½ NPT	86 [3.39]								
160 [6"]	¼ NPT	111 [4.37]	15.5 [0.61]	49.5 [1.95] 1)	161 [6.34]	159 [6.26]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	½ NPT	117 [4.60]								

1) Plus 16 mm [0.630 in] with scale range 0 ... 1,600 bar [0 ... 20,000 psi]

Lower back mount



Process connection with thread per ISO 1179-2

NS	G	Dimensions in mm [in]								
		h ±1	b	D1	D2	e	i	y	k	SW
63 [2 ½"]	G ¼ B	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	18.5 [0.73]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	G ⅛ B	54 [2.13]								
	M12 x 1.5	57 [2.24]								
100 [4"]	G ¼ B	76 [2.99]	49.5 [1.95]	101 [3.98]	99 [3.90]	30 [1.18]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	G ½ B	83 [3.27]								
	M12 x 1.5	76 [2.99]								
	M20 x 1.5	83 [3.27]								
160 [6"]	G ¼ B	76 [2.99] 2)	49.5 [1.95] 1)	161 [6.34]	159 [6.26]	50 [1.97]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	G ½ B	83 [3.27] 2)								
	M12 x 1.5	76 [2.99] 2)								
	M20 x 1.5	83 [3.27] 2)								

Process connection with thread per ISO 7

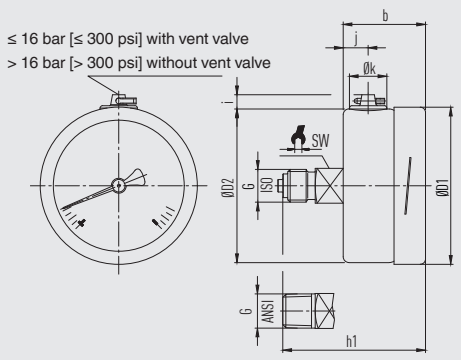
NS	G	Dimensions in mm [in]								
		h ±1	b	D1	D2	e	i	y	k	SW
63 [2 ½"]	R ¼	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	18.5 [0.73]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
100 [4"]	R ¼	76 [2.99]	49.5 [1.95]	101 [3.98]	99 [3.90]	30 [1.181]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	R ½	82 [3.23]								
160 [6"]	R ¼	76 [2.99] 2)	49.5 [1.95] 1)	161 [6.34]	159 [6.26]	50 [1.97]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	R ½	82 [3.23] 2)								

Process connection with thread per ANSI/B1.20.1

NS	G	Dimensions in mm [in]								
		h ±1	b	D1	D2	e	i	y	k	SW
63 [2 ½"]	¼ NPT	54 [2.13]	33 [1.30]	63 [2.48]	62 [2.44]	50 [1.97]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	⅛ NPT	51 [2.01]								
100 [4"]	¼ NPT	80 [3.15]	49.5 [1.95]	101 [3.98]	99 [3.90]	50 [1.97]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	½ NPT	86 [3.39]								
160 [6"]	¼ NPT	76 [2.99] 2)	49.5 [1.95] 1)	161 [6.34]	159 [6.26]	50 [1.97]	6.5 [0.26]	14.5 [0.57]	22.5 [0.89]	22 [0.87]
	½ NPT	82 [3.23] 2)								

1) Plus 16 mm [0.630 in] with scale range 0 ... 1,600 bar [0 ... 20,000 psi]
2) Plus 16 mm [0.630 in] with scale ranges ≥ 0 ... 100 bar [≥ 0 ... 1,500 psi]

NS 63 [2 ½"], centre back mount



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Process connection with thread per ISO 1179-2

NS	G	Dimensions in mm [in]							
		h ±1	b	D1	D2	i	y	k	SW
63 [2 ½"]	G ¼ B	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	G ⅛ B	54 [2.13]							
	M12 x 1.5	57 [2.24]							

Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]							
		h ±1	b	D1	D2	i	y	k	SW
63 [2 ½"]	R ¼	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]

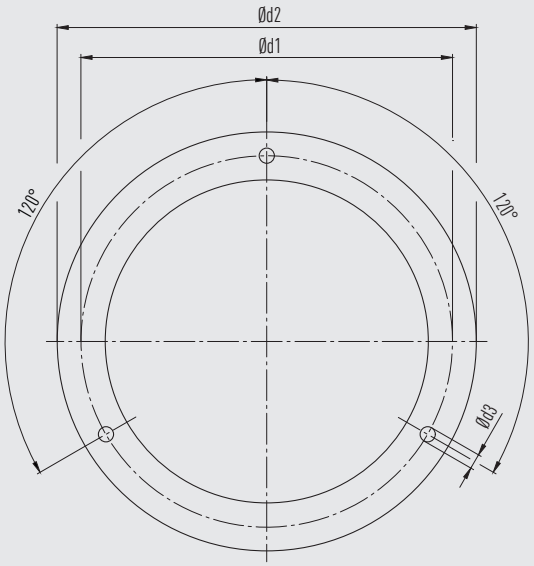
Process connection with thread per ANSI/B1.20.1

NS	G	Dimensions in mm [in]							
		h ±1	b	D1	D2	i	y	k	SW
63 [2 ½"]	¼ NPT	57 [2.24]	33 [1.30]	63 [2.48]	62 [2.44]	6 [0.24]	10 [0.39]	15 [0.59]	14 [0.55]
	⅛ NPT	54 [2.13]							

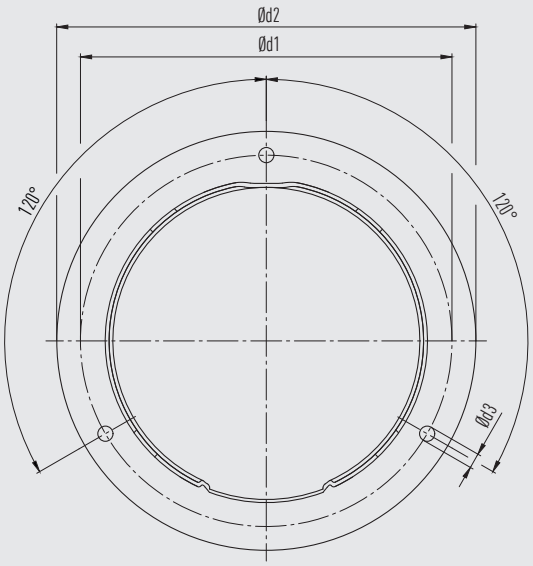
Accessories

Dimensions in mm [in]

Panel mounting flange

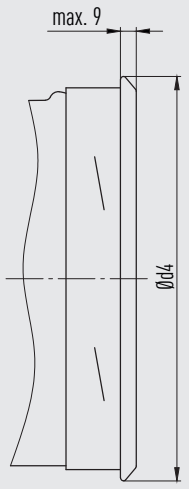


Surface mounting flange



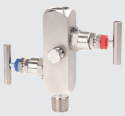
NS	Dimensions in mm [in]			
	Recommended panel cutout	d1	d2	d3
63 [2 ½"]	Ø 67 ±0.3 / Ø 2.6 [Ø 2.64 ±0.01 / Ø 0.10]	75 [2.95]	85 [3.35]	3.6 [0.14]
100 [4"]	Ø 104 ±0.5 / Ø 4.1 [Ø 4.04 ±0.02 / Ø 0.16]	117 [4.61]	132 [5.20]	4.8 [0.19]
160 [6"]	Ø 164 ±0.5 / Ø 6.5 [Ø 6.46 ±0.02 / Ø 0.26]	178 [7.01]	196 [7.71]	5.8 [0.23]

Triangular profile ring



NS	Dimensions in mm [in]	
	Recommended panel cutout	d4
63 [2 ½"]	Ø 64.5 ±0.5 / Ø 2.5 [Ø 2.54 ±0.02 / Ø 0.01]	≤ 69 [2.72]
NS 100 [4"]	Ø 102 ±1.0 / Ø 4.0 [Ø 4.02 ±0.04 / Ø 0.16]	≤ 108 [4.25]
NS 160 [6"]	Ø 162.6 ±1.0 / Ø 6.4 [Ø 6.40 ±0.04 / Ø 0.25]	≤ 168 [6.61]

Accessories and spare parts

Model		Description
	**910.17**	Sealings → 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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We reserve the right to make modifications to the specifications and materials.

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Bourdon tube pressure gauge, copper alloy
Panel mounting series
Models 111.16 and 111.26

for further approvals
see page 3

Applications

- For gaseous and liquid media that are not highly viscous or crystallising and will not attack copper alloy parts
- Heating and air-conditioning technology
- Small-capacity compressors
- Drink dispensers
- Medical engineering

Special features

- Specifically for panel mounting
- Reliable and cost-effective
- Design per EN 837-1
- Scale ranges up to 0 ... 400 bar

Fig. left: Model 111.16
Fig. right: Model 111.26

Description

The models 111.16 and 111.26 have been specifically designed for panel mounting and therefore feature a back mount process connection.

The model 111 pressure gauges are based on the proven Bourdon tube measuring system. On pressurisation, the deflection of the Bourdon tube, proportional to the incident pressure, is transmitted to the movement via a link and indicated.

For easy installation, the plastic cases of the panel mounting series are already equipped with a mounting flange.

The model 111.16 Bourdon tube pressure gauge can be fitted to the panel by means of a mounting bracket (accessory). The model 111.26 is mounted to the panel by “snap-in mounting” using lateral locating lugs at the case. In addition, metallised front bezels can be supplied for the model 111.26.

The panel mounting series of model 111 is also available in customer-specific versions, e.g. with individual dial layout.

Data sheets showing similar products:
Standard version; models 111.10, 111.12; see data sheet PM 01.01

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Specifications

Design
EN 837-1

Nominal size in mm
Model 111.16: 40, 50 and 63
Model 111.26: 40, 50, 63 and 80

Accuracy class
2.5

Scale ranges
0 ... 0.6 to 0 ... 400 bar
or all other equivalent vacuum or combined pressure and vacuum ranges

Pressure limitation

Steady:	3/4 x full scale value
Fluctuating:	2/3 x full scale value
Short time:	Full scale value

Permissible temperature
Ambient: -20 ... +60 °C
Medium: +60 °C maximum

Temperature effect
When the temperature of the measuring system deviates from the reference temperature (+20 °C): max. ±0.4 %/10 K of the span

Process connection
Copper alloy
For process connections and spanner widths see page 4

Pressure element
Copper alloy
C-type or helical type

Movement
Copper alloy

Dial
NS 40, 50, 63: Plastic, white, with pointer stop pin
NS 80: Aluminium, white

Pointer
Plastic, black

Case
Plastic, black

Window
Plastic, crystal-clear, snap-fitted in case

Panel fitting
Model 111.16:
- Panel mounting flange
- Mounting bracket

Model 111.26: Locating lugs on the case side
NS 40, 50, 63: Triangular bezel
NS 80: Front flange

Options

- Other process connection
- Accuracy class 1.6
- Model 111.26, NS 40, 50, 63: Triangular bezel, metallised

Special version

For drinking water installations
Material suitability of the wetted parts in accordance with the evaluation criteria for metallic substances of the German federal environmental agency and the “4MS Common Composition List”.

Approvals

Logo	Description	Country
CE	**EU declaration of conformity** Pressure equipment directive	European Union
EAC	**EAC (option)** Pressure equipment directive	Eurasian Economic Community
	GOST (option) Metrology, measurement technology	Russia
	KazInMetr (option) Metrology, measurement technology	Kazakhstan
	BelGIM (option) Metrology, measurement technology	Belarus
-	**CPA** Metrology, measurement technology	China
-	**CRN** Safety (e.g. electr. safety, overpressure, ...)	Canada

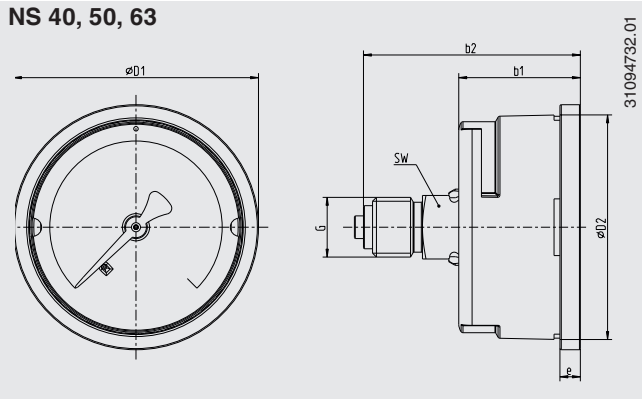
Certificates (option)

- 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy)
- 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)

Dimensions in mm

Model 111.16

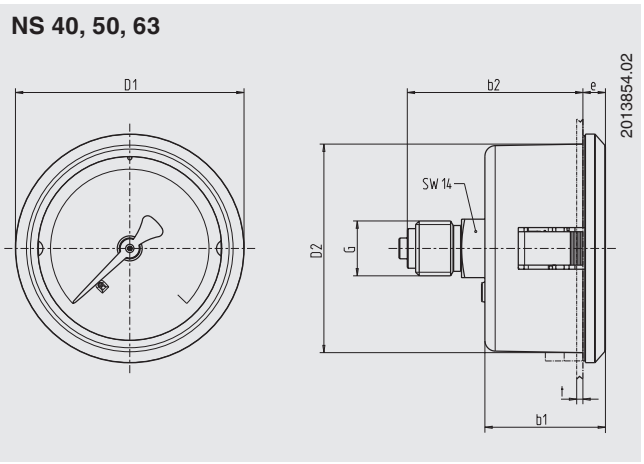
NS 40, 50, 63



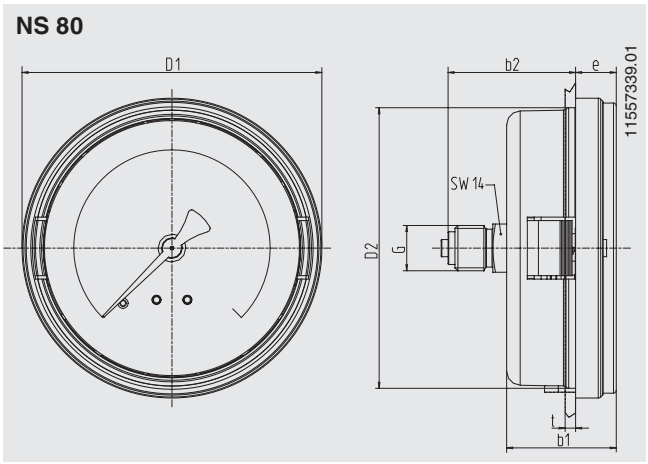
NS	Dimensions in mm							Weight in kg
	b_1 ±0.5	b_2 ±1	D_1	D_2	G	SW	e	
40	26.5	44.5	45	40	G ⅛ B	14	4.5	0.06
50	26.5	47.5	54	49.5	G ¼ B	14	4.5	0.07
63	29.5	47.5	68	63	G ¼ B	14	5	0.08

Model 111.26

NS 40, 50, 63



NS 80



NS	Dimensions in mm							Panel cutout		Weight in kg
	b1 ±0.5	b2 ±1	D1	D2	G	SW	e	Ø	t	
40	29	39	44	40	G 1/8 B	14	5.5	40.5	1.0 ... 2.5	0.06
50	29	42	55	50	G 1/4 B	14	5.5	50.5	1.0 ... 2.5	0.07
63	29	42	68	63	G 1/4 B	14	5.5	63.5	1.0 ... 2.5	0.08
80	32	37	87	81.5	G 1/4 B	14	12	82	1.5 ... 3.5	0.12

Ordering information

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

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07/2017 EN

Bourdon Tube Pressure Gauge
Type 111.10, Black Plastic or Painted Steel Case
Standard Series - Lower Mount

Applications

- Hydraulic and pneumatic systems
- Pumps, compressors, water systems, regulators
- Suitable for fluid medium which does not clog connection port or corrode copper alloy

Bourdon Tube Pressure Gauge Type 111.10

Product features

- Copper alloy wetted parts
- Black plastic or painted steel case
- Lower mount (LM) process connection

Specifications

Design
EN837-1 and ASME B40.100

Sizes (All sizes not stocked)
1½", 2", 2½" and 4" (40, 50, 63, and 100 mm)

Accuracy class
± 3/2/3% of span (ASME B40.100 Grade B)

Ranges (All ranges not stocked)
Vacuum/Compound to 30 "Hg (-1 bar) / 0/ 200 psi (16 bar)
Pressure from 15 psi (1 bar) to 6,000 psi (400 bar)
or other equivalent units of pressure or vacuum
Receiver scales 3...15 psi (0.2 ... 1 bar)

Working pressure
Steady: 3/4 of full scale value
Fluctuating: 2/3 of full scale value
Short time: full scale value

Operating temperature
Ambient: -40°F to 140°F (-40°C to 60°C)
Media: 140°F (+60°C) maximum

Temperature error
Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% of span for every 18°F (10°K) rising or falling.

Pressure connection
Material: copper alloy
Lower mount (LM)
1/8" or 1/4" NPT

Bourdon Tube
Material: copper alloy
≤ 870 psi (60 bar): C-shape
> 870 psi (60 bar): Helical

Movement
Copper alloy

Dial
White plastic with stop pin (1½", 2", 2½")
White aluminum with stop pin (4")
Black or black and red lettering

Pointer
Black ABS plastic (1½", 2", 2½" LM)
Black aluminum (4" LM)

Case
Black plastic

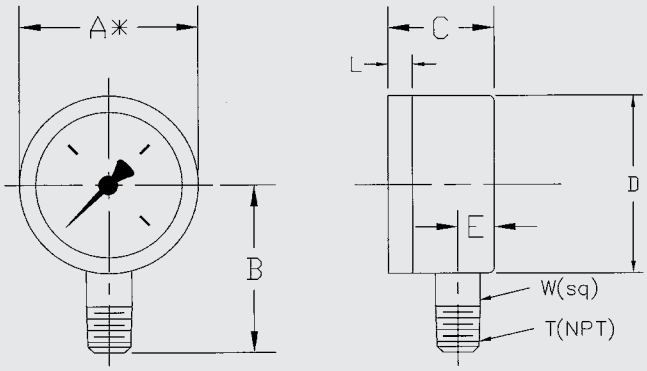
Window
Crystal-clear plastic, snap-fit

Optional Extras

- Accuracy ± 2/1/2% of span (ASME B40.100 Grade A)
- Slip-fit or friction ring
- Case with blowout plug
- Glass window (requires slip-fit or friction ring)
- Black painted steel case
- Stainless steel case
- Brass polished case and friction ring (2½" only)
- Special case colors
- Special connections (limited to wrench flat area)
- Cleaned for oxygen service
- Nickel plated connection
- Medical specification
- Rubber cover (2", 2½")
- Custom dial layout
- Other pressure scales available:
  bar, kPa, MPa, kg/cm² and dual scales
- EN standards
- Red set pointer on aluminum dial or on snap-on window
- External adjust red drag pointer
  (black steel - 2½" case only)

Note: [1]Press-fit brass restrictor standard for 111.10B, 1,000 psi to 6,000 psi

Dimensions



Type 111.10

Size		A	B	C	D	E	L	T	W
1.5”	mm	40	36	26	39	9.6	3.2		14
	in	1.50	1.42	1.02	1.54	0.38	0.13	1/8”	0.55
2”	mm	50	45	27	49	10	3.3		14
	in	1.97	1.77	1.06	1.93	0.39	0.13	1/4”	0.55
2.5”	mm	63	53.5	28	61.5	10	3.4		14
	in	2.48	2.11	1.10	2.42	0.39	0.14	1/4”	0.55
4”	mm	100	83.5	30	99	11.5	3.8		14
	in	3.94	3.29	1.18	3.9	0.45	0.15	1/4”	0.55

Type 111.10B (brass case version)

Size		A	B	C	D	E	L	T	W
2.5”	mm	63	52	27	61.5	9.5	10		14
	in	2.48	2.05	1.06	2.42	0.37	0.39	1/4”	0.55

Ordering information
Pressure gauge model / Nominal size / Scale range / Size of connection / Optional extras required
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Bourdon Tube Pressure Gauge
Type 111.12, Black Plastic or Painted Steel Case
Standard Series - Center Back Mount

Applications

- Hydraulic and pneumatic systems
- Pumps, compressors, water systems, regulators
- Suitable for fluid medium which does not clog connection port or corrode copper alloy

Bourdon Tube Pressure Gauge Type 111.12

Product features

- Copper alloy wetted parts
- Black plastic or painted steel case
- Center back mount (CBM) process connection

Specifications

Design
EN 837-1 & ASME B40.100

Sizes (All sizes not stocked)
1½", 2", 2½" and 4" (40, 50, 63, and 100 mm)
3½" (94 mm) with u-clamp only

Accuracy class
± 3/2/3% of span (ASME B40.100 Grade B)

Ranges (All ranges not stocked)
Vacuum/Compound to 30"Hg (-1 bar) / 0/ 200 psi (16 bar)
Pressure from 15 psi (1 bar) to 6,000 psi (400 bar)
or other equivalent units of pressure or vacuum
Receiver scales 3...15 psi (0.2 ... 1 bar)

Working pressure
Steady: 3/4 of full scale value
Fluctuating: 2/3 of full scale value
Short time: full scale value

Operating temperature
Ambient: -40°F to 140°F (-40°C to 60°C)
Media: 140°F (+60°C) maximum

Temperature error
Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% of span for every 18°F (10°K) rising or falling.

Pressure connection
Material: copper alloy
Center back mount (CBM)
1/8" or 1/4" NPT

Bourdon Tube
Material: copper alloy
≤ 870 psi (60 bar): C-shape
> 870 psi (60 bar): Helical

Movement
Copper alloy

Dial
White plastic with stop pin (1½", 2", 2½")
White aluminum with stop pin (3½" & 4")
Black or black and red lettering

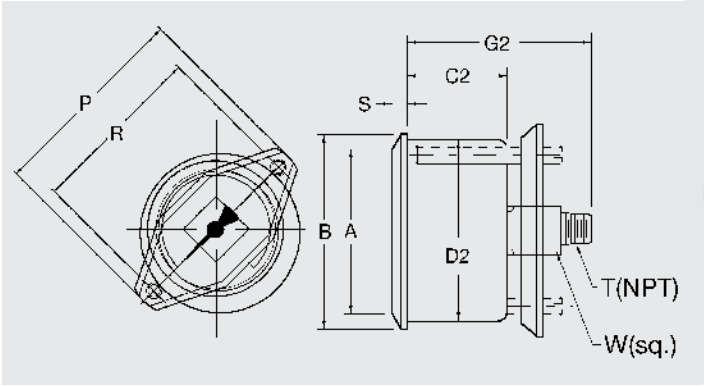
Pointer
Black ABS plastic (1½", 2", 2½")
Black aluminum (3½" & 4")

Case
Black plastic (1½", 2", 2½", & 4")
Black-painted steel (3½")

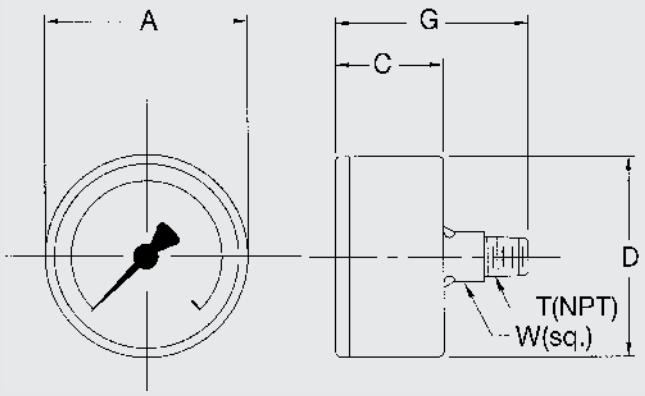
Window
Crystal-clear plastic, snap-fit (1½", 2", 2½", & 4")
Crystal-clear plastic, threaded (3½")

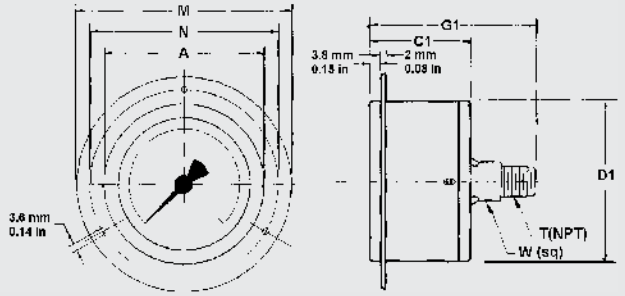
Optional Extras

- Accuracy ± 2/1/2% of span (ASME B40.100 Grade A)
- U-clamp panel mounting
- Front flange
- Slip-fit or friction ring
- Case with weep hole
- Glass window (requires slip-fit or profile ring)
- Black painted steel case
- Stainless steel case
- Special case colors
- Special connections (limited to wrench flat area)
- Cleaned for oxygen service
- Nickel plated connection
- Medical specification
- Rubber cover (2", 2½")
- Custom dial layout
- Other pressure scales available:
  bar, kPa, MPa, kg/cm² and dual scales
- EN standards
- Red set pointer on aluminum dial or on snap-on window
- External adjust red drag pointer
  (black steel - 2½" case only)



Dimensions





Recommended panel cutout is D, D1 or D2 + 1.5 mm (0.04in.)

Size		(Standard Version)																
		A	B[1]	C	C1	C2	D	D1	D2	G	G2	M	N	P	R	T	W	Weight[2]
1.5”	**mm**	40	43.21	26	-	24	41	-	40	46.5	45	-	-	59	47		14	
	in	1.57	1.7	1.02	-	0.94	1.61	-	1.57	1.83	1.77	-	-	2.32	1.85	1/8”	0.55	0.16 lb.
2”	**mm**	50	54	26.5	28.5	24	49	55	49	47	47	71	60	70	57		14	
	in	1.97	2.12	1.04	1.12	0.94	1.93	2.17	1.93	1.85	1.85	2.80	2.36	2.76	2.24	1/4”	0.55	0.22 lb.
2.5”	**mm**	63	67.18	27.5	29.5	26	61.5	68	62	48	53	85	75	91	78		14	
	in	2.48	2.6	1.08	1.16	1.02	2.42	2.68	2.44	1.89	2.09	3.35	2.95	3.58	3.07	1/4”	0.55	0.29 lb.
3.5”	**mm**	80	99.3	-	-	36	-	-	93	-	57	-	-	-	-		14	
	in	3.15	3.9	-	-	1.42	-	-	3.66	-	2.24	-	-	-	-	1/4”	0.55	0.35 lb.
4”	**mm**	100	-	31	-	-	99	-	-	49	-	-	-	-	-		14	
	in	3.94	-	1.22	-	-	3.9	-	-	1.93	-	-	-	-	-	1/4”	0.55	0.46 lb.

[1] B dimension: outside dimension of profile ring.
[2] Weight is for base gauge without optional accessories.

Ordering information
Pressure gauge model / Nominal size / Scale range / Size of connection / Optional extras required
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Bourdon Tube Pressure Gauges
Stainless Steel Series
Model 131.11

Applications

- Suitable for corrosive environments and gaseous or liquid media that will not obstruct the pressure system
- CDA (Clean Dry Air) applications
- Indication of failure alarm on gas bottles
- Mechanical engineering and plant construction

Special Features

- All stainless steel construction
- Cost effective and reliable
- Compatible with alarm contacts (50 mm)
- Scale ranges up to 0 … 1000 bar

Bourdon Tube Pressure Gauge Model 131.11.50 with 2nd scale psi

Description

Design
EN 837-1

Nominal size
40, 50 and 63 mm

Accuracy class
2.5

Scale ranges
40 and 50 mm: 0 ... 1 to 0 ... 600 bar
63 mm: 0 ... 1 to 0 ... 1000 bar
or other equivalent units of pressure or vacuum

Working pressure
Steady: ¾ of full scale value
Fluctuating: ⅔ of full scale value
Short time: full scale value

Operating temperature
Ambient: -40 ... +60 °C
Medium: +100 °C maximum

Temperature effect
When temperature of the pressure element deviates from reference temperature (+20 °C):
max. ±0.4 %/10 K of true scale value

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Standard features

Pressure connection
Material: stainless steel
Lower mount (LM) or centre back mount (CBM)
G ¼ B (male), 14 mm flats

Pressure element
Material: stainless steel
< 100 bar: C-type
≥ 100 bar: helical type

Movement
Stainless steel

Dial
White aluminium with black lettering, with pointer stop pin

Pointer
Black aluminium

Case
Natural finish stainless steel

Window
Polycarbonate, snap-fit window

Special versions

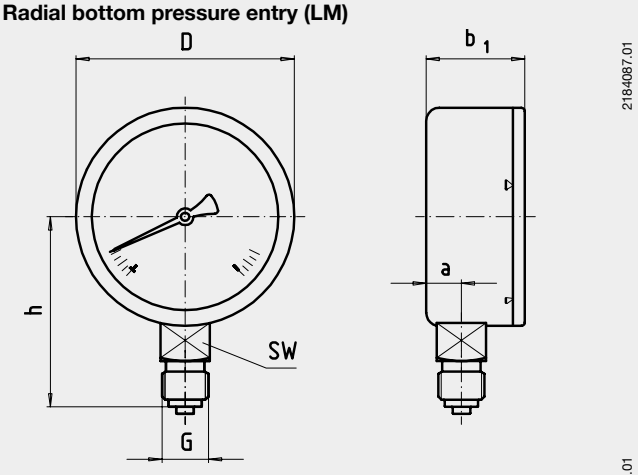
Ammonia gauges (63 mm)
Scale in °C for refrigerant R 717 (NH_3),
Pressure ranges: -1 ... 0 ... 15 bar or -1 ... 0 ... 26 bar

Optional extras

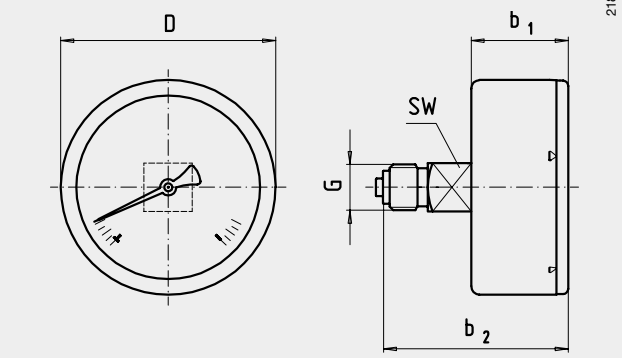
- Other pressure connection
- Assembly on diaphragm seals see product review DS
- Slip-on bezel, stainless steel, polished, with instrument glass window
- 3-hole panel mounting flange, stainless steel, polished
- 3-hole surface mounting flange, stainless steel (63 mm only)
- Triangular bezel, stainless steel, polished, with clamp (only centre back mount)
- Alarm contacts (50 mm, see data sheet SP 01.03)

Standard version

Radial bottom pressure entry (LM)



Centre back pressure entry (CBM)



Dimensions in mm

NS	Dimensions in mm							Weight in kg
	a	b_1	b_2 ± 1	D	G	h ± 1	SW	
40	9	25	52.5	39	G ¼ B	39	14	0.05
50	9.6	27	53.5	49	G ¼ B	47	14	0.09
63	10	28	53.5	62	G ¼ B	54	14	0.12

Standard pressure entry with parallel thread and sealing to EN 837-1 / 7.3

Ordering information
Pressure gauge model / Nominal size / Scale range / Size and location of connection / Optional extras required

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9019685 03/2007 GB

Bourdon tube pressure gauge
Model 213.53, liquid filling, stainless steel case

Applications

- For measuring points with high dynamic pressure loads or vibrations
- For gaseous and liquid media that are not highly viscous or crystallising and will not attack copper alloy parts
- Hydraulics
- Compressors, shipbuilding

Special features

- Vibration and shock resistant
- Especially sturdy design
- NS 63 and 100 with German Lloyd and Gosstandart approval
- Scale ranges up to 0 ... 1000 bar

Bourdon tube pressure gauge, model 213.53.100, lower mount

Description

Design
EN 837-1

Nominal size in mm
50, 63, 100

Accuracy class
NS 50, 63: 1.6
NS 100: 1.0

Scale ranges
NS 50: 0 ... 1 to 0 ... 400 bar
NS 63, 100: 0 ... 0.6 to 0 ... 1000 bar
or all other equivalent vacuum or combined pressure and vacuum ranges

Pressure limitation

NS 50, 63:	Steady:	3/4 x full scale value
	Fluctuating:	2/3 x full scale value
	Short time:	Full scale value
NS 100:	Steady:	Full scale value
	Fluctuating:	0.9 x full scale value
	Short time:	1.3 x full scale value

Permissible temperature
Ambient: -20 ... +60 °C
Medium: +60 °C maximum

Temperature effect
When the temperature of the measuring system deviates from the reference temperature (+20 °C):
Max. ±0.4 %/10 K of the span

Ingress protection
IP 65 per EN 60529 / IEC 529

Data sheets showing similar products:
Standard version with liquid filling; model 113.53; see data sheet PM 01.08

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Process connection
Cu-alloy,
lower mount (LM) or back mount (BM),
NS 50, 63: G ¼ B (male), 14 mm flats
NS 100: G ½ B (male), 22 mm flats

Pressure element
NS 50, 63:
< 60 bar: Cu-alloy, C-type
≥ 60 bar: Cu-alloy, helical type
NS 100:
< 100 bar: Cu-alloy, C-type
≥ 100 bar: Stainless steel 316L, helical type

Movement
Cu-alloy

Dial
NS 50, 63: Plastic ABS, white, with pointer stop pin
NS 100: Aluminium, white, black lettering

Pointer
NS 50, 63: Plastic, black
NS 100: Aluminium, black

Window
Plastic, crystal-clear

Case
Natural finish stainless steel, with pressure relief at case circumference, 12 o'clock.
O-ring seal between case and connection.
Scale ranges ≤ 0 ... 16 bar with compensating valve to vent case.

Bezel ring
Crimp ring, glossy finish stainless steel, triangular bezel

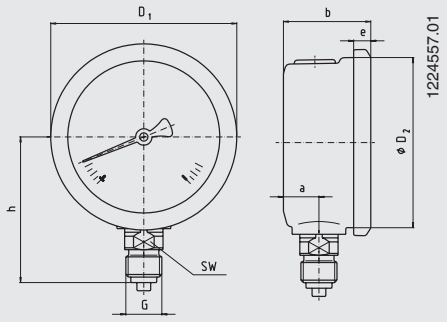
Filling liquid
Glycerine 99.7 %

Options

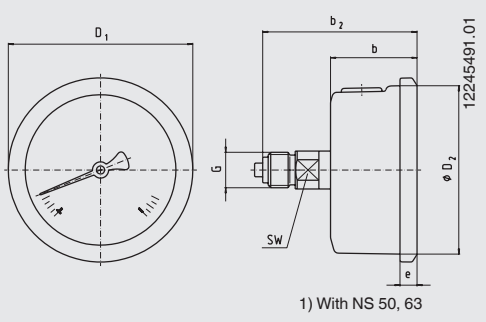
- Measuring system and movement from stainless steel (model 233.53)
- NS 100: Zero adjustment (in front)
- Increased medium temperature with special soft solder
  - NS 50, 63: 100 °C
  - NS 100: 150 °C
- Ambient temperature resistant -40 ... +60 °C with silicone oil filling
- Panel mounting flange, stainless steel, for back connection
- Surface mounting flange, stainless steel (not NS 50)
- Mounting clamp (for back connection)

Dimensions in mm

Lower mount (LM)

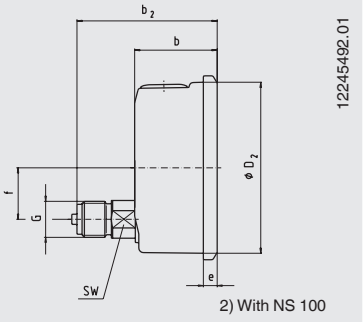


Centre back mount (CBM) 1)



1) With NS 50, 63

Lower back mount (LBM) 2)



2) With NS 100

NS	Dimensions in mm										Weight in kg
	a	b ± 0.5	b_2 ± 0.5	D_1	D_2	e	f	G	h ± 1	SW	
50	12	30	55	55	50	5.5	-	G ¼ B	48	14	0.15
63	13	32	56	68	62	6.5	-	G ¼ B	54	14	0.21
100	15.5	48	81.5	107	100	8	30	G ½ B	87	22	0.80

Process connection per EN 837-1 / 7.3

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

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05/2011 GB

Capsule pressure gauge, stainless steel
For the process industry
Models 632.50, 633.50, NS 63, 100, 160

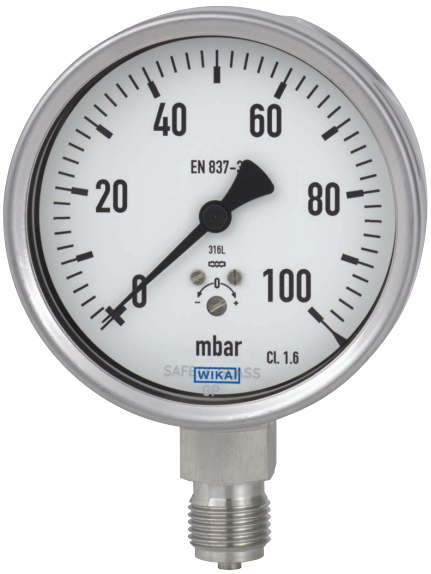
for further approvals
see page 3

Applications

- With liquid-filled case for applications with high dynamic pressure loads or vibrations (model 633.50)
- For gaseous, dry and aggressive media, also in aggressive environments
- Process industry: Chemical, petrochemical, pharmaceutical, biotechnology, machine and power generation industries

Special features

- Zero point correction in front
- Completely from stainless steel
- Special connection location on request
- Low scale ranges from 0 ... 2.5 mbar



Capsule pressure gauge model 632.50

Description

The model 632.50 capsule pressure gauges are completely manufactured from stainless steel and are therefore particularly suited for applications in the process industry. They are based upon the proven capsule measuring system. On pressurisation, the expansion of the capsule element, proportional to the incident pressure, is transmitted to the movement and indicated.

The modular design enables a multitude of combinations of case materials, process connections, nominal sizes and scale ranges. Due to this high variance, the instrument is suitable for use in a wide range of applications within the process industry.

For mounting in control panels, the capsule pressure gauges can, depending on the process connection, be fitted with a mounting flange or with a triangular profile ring and mounting bracket.

The model 633.50 with liquid-filled case is suitable for high dynamic pressure loads and vibrations.

Data sheets showing similar products:
Test gauge, stainless steel; model 610.20, class 0.6, NS 160; see data sheet PM 06.09
Capsule pressure gauge, copper alloy; model 612.20, NS 63, 100, 160; see data sheet PM 06.02

Part of your business

Standard version

Design
EN 837-3

Nominal size in mm
63, 100, 160

Accuracy class
1.6

Scale ranges
NS 63: 0 ... 40 mbar to 0 ... 600 mbar
NS 100: 0 ... 16 mbar to 0 ... 600 mbar
NS 160: 0 ... 2.5 mbar to 0 ... 600 mbar
or all other equivalent vacuum or combined pressure and vacuum ranges

Pressure limitation
Steady: Full scale value
Fluctuating: 0.9 x full scale value

Permissible temperature
Ambient: -20 … +60 °C
Medium: ≤ 100 °C

Temperature effect
When the temperature of the measuring system deviates from the reference temperature (+20 °C): max. ±0.6 %/10 K of full scale value

Ingress protection per IEC/EN 60529
IP54 for model 632.50 (without case filling)
IP65 for model 633.50 (with case filling)

Process connection
Stainless steel 316L
Lower mount (radial) or lower back mount [1)]
NS 63: Male thread G ¼ B, SW 14
NS 100, 160: Male thread G ½ B, SW 22

Pressure element
Stainless steel 316L

Sealing
FPM/FKM

Movement
Stainless steel

Zero point setting
In front

Dial
Aluminium, white, black lettering

Pointer
Aluminium, black

Case
Stainless steel

Window
Laminated safety glass
(for case filling: Polycarbonate or clear non-splintering plastic)

Ring
Bayonet ring, stainless steel

Case filling [1)]
Glycerine-water mixture for scale ranges ≥ 60 mbar [2)]

1) only available for model 633.50 with NS 100, 160
2) Option accuracy class 1.0 available from ≥ 100 mbar

Options

- Other process connection
- Sealings (model 910.17, see data sheet AC 09.08)
- Accuracy class 1.0 for model 632.50 and scale range ≥ 40 mbar (without fill fluid)
- Accuracy class 1.0 for model 633.50 and scale range ≥ 100 mbar (with fill fluid)
- Permissible ambient temperatures -40 ... +60 °C:
  Model 632.50: Movement wetted with Fomblin® Z03
  Model 633.50: Case filling with silicone oil
- Overload or vacuum safety with scale range:
  > 40 mbar: 10 x full scale value
  ≤ 40 mbar: 3 x full scale value
- Surface mounting flange
- NS 100 and 160: Panel mounting flange
- NS 100 and 160: Triangular profile ring with clamp
- Switch contact for model 632.50.100, from scale range ≥ 100 mbar (model 831, see data sheet AC 08.01)

Approvals

Logo	Description	Country
CE Ex	**EU declaration of conformity** ■ Pressure equipment directive ■ ATEX directive (option) Hazardous areas Zone 1 gas II 2G Ex h IIC T6 ... T1 Gb Zone 20 dust II 2D Ex h IIIC T85°C ... T450°C Db Ignition protection type “c”, constructive safety	European Union
EAC Ex	**EAC (option)** ■ Pressure equipment directive ■ Hazardous areas	Eurasian Economic Community
	GOST (option) Metrology, measurement technology	Russia
	KazInMetr (option) Metrology, measurement technology	Kazakhstan
-	**MTSCHS (option)** Permission for commissioning	Kazakhstan
	BelGIM (option) Metrology, measurement technology	Belarus
	UkrSEPRO (option) Metrology, measurement technology	Ukraine
	Uzstandard (option) Metrology, measurement technology	Uzbekistan
-	**CPA (option)** Metrology, measurement technology	China

Certificates (option)

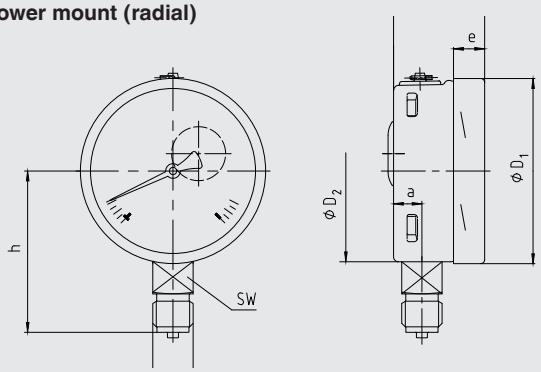
- 2.2 test report
- 3.1 inspection certificate

Approvals and certificates, see website

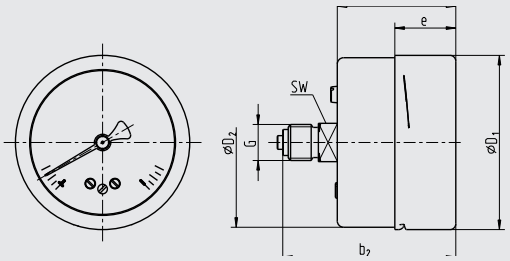
Dimensions in mm

Standard version

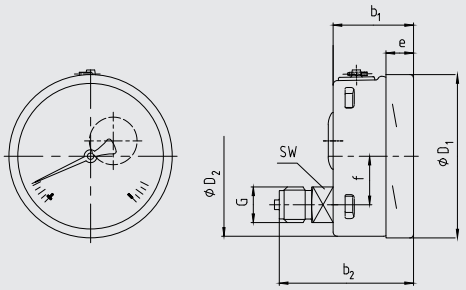
Lower mount (radial)



Centre back mount



Lower back mount



NS	Dimensions in mm											Weight in kg
	a	b	b_1	b_2	D_1	D_2	e	f	G	h ±1	SW	
63	9.5	42	42	63	64	62	22	- [1]	G ¼ B	52	14	0.19
100	15.5	49.5	49.5	83	101	99	17.5	30	G ½ B	87	22	0.60
160	15.5	49.5	49.5	83	161	159	17.5	50	G ½ B	118	22	1.10

Process connection per EN 837-1 / 7.3
1) With NS 63: Centre back mount process connection

Ordering information

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

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