

Diaphragm pressure gauge for the process industry

Model 432.50, up to 10-fold overload safety, max. 40 bar

Model 432.30, safety version, up to 10-fold overload safety

WIKA data sheet PM 04.03



for further approvals, see
page 7

Applications

- For measuring locations with increased overload
- With liquid-filled case suitability for high dynamic pressure loads and vibrations (models 433.50, 433.30)
- For gaseous, liquid and aggressive media, also in aggressive environments
- With open connecting flange also suitable for contaminated and viscous media
- Process industry: Chemical industry, petrochemical industry, oil and gas, power generation, water and wastewater technology, machine building and general plant construction

Special features

- Case and wetted parts from stainless steel
- Wide choice of special materials
- High overload safety up to the 10-fold full scale value
- Process connection thread or open flange
- Scale ranges from 0 ... 16 mbar

Description

Diaphragm pressure gauges are preferably used for low pressure ranges. Through the large working surface of the circular, corrugated diaphragm element, small pressure ranges can be measured reliably.

The diaphragm pressure gauges are manufactured in accordance with EN 837-3. The high-quality design is particularly suitable for applications in the chemical and petrochemical industry, oil and gas industry and power engineering.

The case and wetted parts from stainless steel fulfil high requirements for resistance against aggressive media. For especially high resistance requirements, the pressure chamber can be designed with a wide variety of special materials such as PTFE, tantalum or Hastelloy.

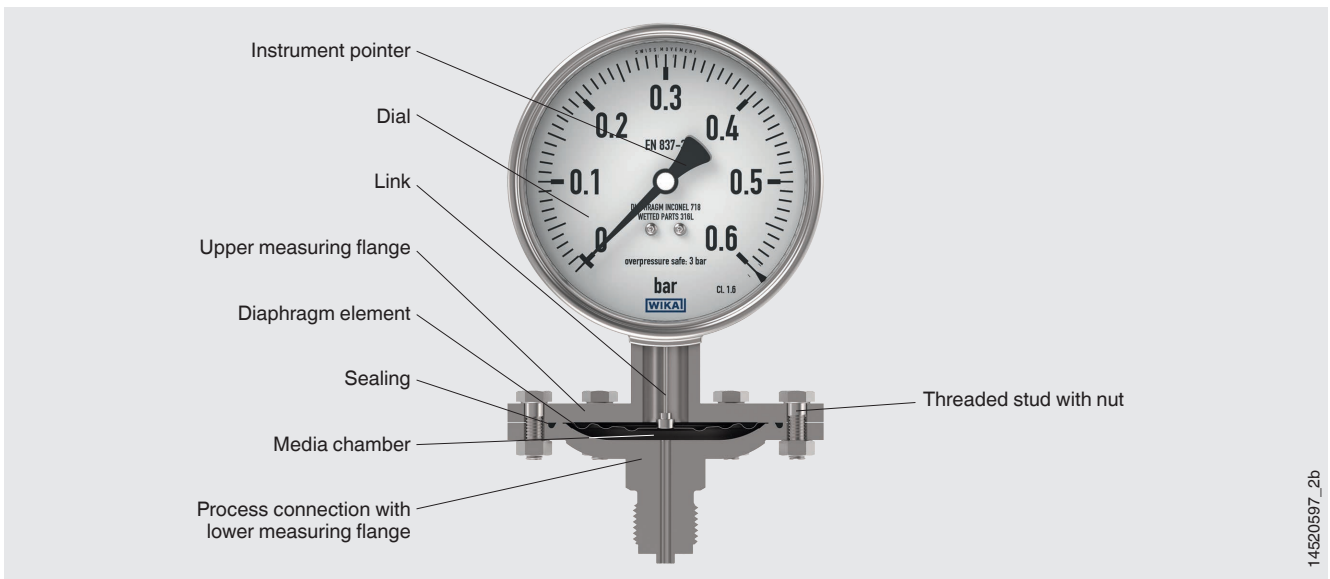


Diaphragm pressure gauge model 432.50

For the measurement of highly viscous, crystallising or contaminated media, the use of an open connecting flange is recommended. The open connecting flange has the advantage over a threaded connection that the pressure port cannot become blocked. With an additional flushing bore on the open connecting flange, the pressure chamber can be easily cleaned.

Measuring systems with diaphragm elements, on the grounds of their design, offer good protection from overload, since the diaphragm can support itself against the upper flange. As standard, this diaphragm pressure gauge already features an overload safety of 5 times the full scale value. Versions with higher overload safeties can be realised on request.

Functionality



Diaphragm elements are circular, corrugated diaphragms. They are clamped together at the edge between two flanges and are subjected to the pressure on one side by the pressure in the media chamber. The resulting deflection is transmitted to the movement via the link and displayed on the dial with the instrument pointer.

Overload safety

Diaphragm elements have a relatively large actuating force and, due to the annular clamping of the element, they are less sensitive to vibration in comparison with Bourdon tubes. Diaphragm elements can be subject to higher overload of up to 10 times the full scale value, up to a max. of 40 bar, through load take-up points (by bringing the diaphragm element up against the upper measuring flange). With a scale range of 0 ... 4 bar and 10-fold overload safety, a short-term overpressure of up to 40 bar is not problematic, as the accuracy is not affected.

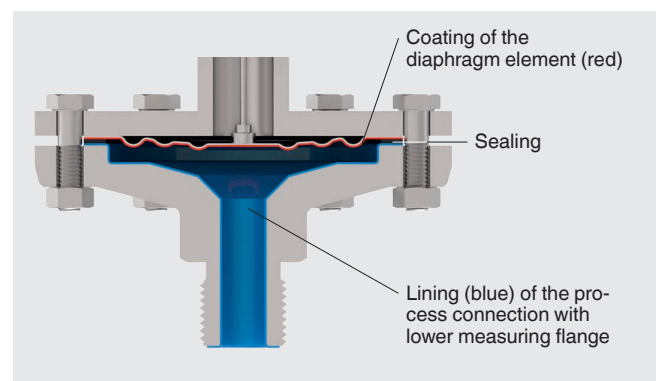
Versions for special media

Larger pressure ports, open connecting flanges and purging options can be integrated for measuring highly viscous, contaminated or crystallising media.

Coating / Lining of wetted parts

By selecting a coating / lining for the wetted parts, the instrument can also be used for extremely corrosive media. The materials suitable for this can either be selected for the diaphragm element only, or together with the process connection with lower measuring connection in a freely combinable manner. The selection of the material combination determines whether it is self-sealing or implemented with a sealing.

→ Available materials (wetted) see page 3



Specifications

Basic information	
Standard	
Diaphragm and capsule pressure gauges	EN 837-3
→ For information on the "Selection, installation, handling and operation of pressure gauges", see Technical information IN 00.05.	
Nominal size (NS)	<ul style="list-style-type: none"> ■ Ø 100 mm [4"] ■ Ø 160 mm [6"]
Window	Laminated safety glass
Case	
Design, models 432.50 and 433.50	Safety level "S1" per EN 837-1: With blow-out device
Design, models 432.30 and 433.30	Safety level "S3" per EN 837-1: With solid baffle wall and blow-out back
Material	<ul style="list-style-type: none"> ■ Stainless steel 1.4301 (304) ■ Stainless steel 1.4571 (316 Ti)
Case filling	<ul style="list-style-type: none"> ■ Without ■ Glycerine-water mixture ¹⁾ ■ Silicone oil M50 ¹⁾ Instruments with case filling with compensating valve to vent case.
Movement	Stainless steel

1) Ingress protection IP65 for instruments with case filling

Measuring element	
Type of measuring element	Diaphragm element
Materials (wetted)	
Diaphragm element	<ul style="list-style-type: none"> ■ Stainless steel 316L, for span ≤ 0.25 bar ■ NiCr alloy (Inconel), for span > 0.25 bar
Process connection with lower measuring flange	Stainless steel 316L
Coating / Lining ^{1) 2)}	<ul style="list-style-type: none"> ■ Without ■ PTFE ■ Hastelloy ■ Monel ■ Tantalum ■ Gold (only for diaphragm element) Other materials on request
Sealing ³⁾	FPM/FKM

1) Diaphragm elements and process connections with lower measuring flanges can be coated / lined with various materials.

→ See page 2

2) Accuracy class 2.5 with selection of a coating / lining.

3) The selection of the material combination determines whether it is self-sealing or implemented with a sealing.

Accuracy specifications	
Accuracy class	<ul style="list-style-type: none"> ■ 1.6 ¹⁾ ■ 2.5 ²⁾
Temperature error	On deviation from the reference conditions at the measuring system: ≤ ±0.8 % per 10 °C [≤ ±0.8 % per 18 °F] of full scale value
Reference conditions	
Ambient temperature	+20 °C [68 °F]

1) After feasibility test, if necessary, accuracy class 1.0 is possible.

2) Accuracy class 2.5 with selection of a coating / lining.

Scale ranges

Scale range	Overload safety ¹⁾	Vacuum-resistant to -1 bar
mbar		
0 ... 16	■ 80 ■ 160	Selectable
0 ... 25	■ 125 ■ 250	Selectable
0 ... 40	■ 200 ■ 400	Selectable
0 ... 60	■ 300 ■ 600	Selectable
0 ... 100	■ 500 ■ 1,000	Selectable
0 ... 160	■ 800 ■ 1,600	Selectable
0 ... 250	■ 1,250 ■ 2,500	Selectable
0 ... 400	■ 2,000 ■ 4,000	Selectable
0 ... 600	■ 3,000 ■ 6,000	Selectable
0 ... 1,000	■ 5,000 ■ 10,000	Selectable
bar		
0 ... 0.6	■ 3 ■ 6	Selectable
0 ... 1	■ 5 ■ 10	Selectable
0 ... 1.6	■ 8 ■ 16	Selectable
0 ... 2.5	■ 12.5 ■ 25	Selectable
0 ... 4	■ 20 ■ 40	Yes
0 ... 6	■ 30 ■ 40	Yes
0 ... 10	40	Yes
0 ... 16	40	Yes
0 ... 25	40	Yes

Vacuum scale ranges ²⁾

Scale range	
mbar	
-16 ... 0	-250 ... 0
-40 ... 0	-400 ... 0
-60 ... 0	-600 ... 0
-100 ... 0	-1,000 ... 0
-160 ... 0	
bar	
-0.6 ... 0	psi
-1 ... 0	-15 inHg ... 0
	-30 inHg ... 0

Scale range	Overload safety ¹⁾	Vacuum-resistant to -1 bar
psi		
0 ... 10	■ 50 ■ 100	Selectable
0 ... 15	■ 75 ■ 150	Selectable
0 ... 30	■ 150 ■ 300	Selectable
0 ... 60	■ 300 ■ 600	Yes
0 ... 100	■ 500 ■ 1,000	Yes
0 ... 150	■ 750 ■ 1,500	Yes
0 ... 160	■ 800 ■ 1,600	Yes
0 ... 200	■ 1,000 ■ 2,000	Yes
0 ... 250	■ 1,250 ■ 2,500	Yes
0 ... 300	■ 1,500 ■ 3,000	Yes
0 ... 400	■ 2,000 ■ 4,000	Yes

+/- scale ranges ²⁾

Scale range	
mbar	bar
-5 ... +20	-1 ... +0.6
-6 ... +10	-1 ... +1
-10 ... +15	-1 ... +1.5
-15 ... +25	-1 ... +2
-20 ... +40	-1 ... +3
-30 ... +30	-1 ... +5
-40 ... +60	-1 ... +9
-50 ... +200	-1 ... +10
-60 ... +100	-1 ... +15
-100 ... +150	-1 ... +24
-125 ... +125	psi
-150 ... +250	-30 inHg ... +15
-250 ... +750	-30 inHg ... +60
-400 ... +600	-30 inHg ... +100
-500 ... +500	-30 inHg ... +160
-600 ... +400	-30 inHg ... +200
-750 ... +250	-30 inHg ... +300
-800 ... +200	

1) The specified values for overload safety and vacuum resistance are only valid for versions without coating / lining.

2) Specifications for overload safety and vacuum resistance on request.

Other scale ranges on request

Further details on: Scale ranges		
Unit	<ul style="list-style-type: none"> ■ bar ■ psi ■ mbar ■ kg/cm² ■ MPa ■ kPa Other units on request	
Overload safety	<ul style="list-style-type: none"> ■ 5 x full scale value, max. 40 bar ■ 10 x full scale value, max. 40 bar 	
Vacuum resistance	<ul style="list-style-type: none"> ■ Without ■ Vacuum-resistant to -1 bar 	
Dial		
Scale layout	<ul style="list-style-type: none"> ■ Single scale ■ Dual scale 	
Scale colour	Single scale	Black
	Dual scale	Black/red
Material	Aluminium	
Customer-specific version	Other scales, e.g. with red mark, circular arcs or circular sectors, on request → Alternatively, adhesive label set for red and green circular arcs; see data sheet AC 08.03	
Instrument pointer	Aluminium, black	

Process connection	
Standard	<ul style="list-style-type: none"> ■ EN 837 ■ ANSI / ASME B1.20.1 ■ ASME B16.5 ■ EN 1092-1, form B
Size ¹⁾	
EN 837	<ul style="list-style-type: none"> ■ G ½ B ■ M20 x 1.5
ANSI / ASME B1.20.1	<ul style="list-style-type: none"> ■ ½ NPT
ASME B16.5	<ul style="list-style-type: none"> ■ Open connecting flange 1" class 150, RF ■ Open connecting flange 2" class 150, RF ■ Open connecting flange 1" class 300, RF
EN 1092-1, form B	<ul style="list-style-type: none"> ■ Open connecting flange DN 25 PN 40 ■ Open connecting flange DN 50 PN 40
Materials (wetted)	
Diaphragm element	<ul style="list-style-type: none"> ■ Stainless steel 316L, for span ≤ 0.25 bar ■ NiCr alloy (Inconel), for span > 0.25 bar
Process connection with lower measuring flange	Stainless steel 316L
Coating / Lining ^{2) 3)}	<ul style="list-style-type: none"> ■ Without ■ PTFE ■ Hastelloy ■ Monel ■ Tantalum ■ Gold (only for diaphragm element)
	Other materials on request
Sealing ⁴⁾	FPM/FKM

1) Further threaded connections and open connecting flanges per ASME B16.5 / EN 1092-1 form B from DN 15 to DN 80 (→ See data sheet IN 00.10)

2) Diaphragm elements and process connections with lower measuring flanges can be coated / lined with various materials.
→ See page 2

3) Accuracy class 2.5 with selection of a coating / lining.

4) The selection of the material combination determines whether it is self-sealing or implemented with a sealing.

Other process connections on request

Operating conditions	
Medium temperature range	<ul style="list-style-type: none"> ■ +100 °C [+212 °F] maximum ■ +200 °C [+392 °F] maximum
Ambient temperature range	<ul style="list-style-type: none"> ■ -20 ... +60 °C [-4 ... +140 °F] ■ -40 ... +60 °C [-40 ... +140 °F] ¹⁾
Storage temperature range	-40 ... +70 °C [-40 ... 158 °F]
Pressure limitation	
Steady	Full scale value
Fluctuating	0.9 x full scale value
Ingress protection per IEC/EN 60529	<ul style="list-style-type: none"> ■ IP54 ■ IP65 ²⁾ ■ IP66 ³⁾ (ingress protection of the case)

1) Only selectable in combination with silicone oil case filling

2) Ingress protection IP65 for instruments with case filling

3) Hermetically sealed case; see data sheet IN 00.18

Other versions

- Version for hazardous areas (Ex h)
- Diaphragm pressure gauge with switch contacts, models PGS43.100, PGS43.160; see data sheet PV 24.03
- Diaphragm pressure gauge with output signal, models PGT43.100, PGT43.160; see data sheet PV 14.03
- Oil- and grease-free
- For oxygen, oil- and grease-free
- Silicone-free
- Per NACE ¹⁾ MR0175 / ISO 15156, use in H₂S-containing environments in oil and gas production
- Per NACE ¹⁾ MR0103 / ISO 17945, metals resistant to sulphide stress cracking
- With pre-volume deflagration flame arrester ²⁾ for connection to zone 0 (EPL Ga); model 910.21; see data sheet AC 91.02
- With flushing bore on the open connecting flange










1) General information about NACE standards, see data sheet IN 00.21

2) Only for instruments with Ex approval

Approvals

Logo	Description	Region
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

Optional approvals

Logo	Description	Region
 	EU declaration of conformity ATEX directive ¹⁾ Hazardous areas Gas II 2G h IIC T6 ... T1 Gb X Dust II 2D h IIIC T85°C ... T450°C Db X	European Union
	EAC Hazardous areas ¹⁾	Eurasian Economic Community
	Ex Ukraine Hazardous areas ¹⁾	Ukraine
	PAC Russia Metrology, measurement technology	Russia
	PAC Kazakhstan Metrology, measurement technology	Kazakhstan
-	MChS Permission for commissioning	Kazakhstan
	PAC Belarus Metrology, measurement technology	Belarus
	PAC Ukraine Metrology, measurement technology	Ukraine
	PAC Uzbekistan Metrology, measurement technology	Uzbekistan
-	CPA Metrology, measurement technology	China

¹⁾ In the area of the coating / lining from PTFE, measures must be taken, if necessary, in order to exclude electrostatic charging.

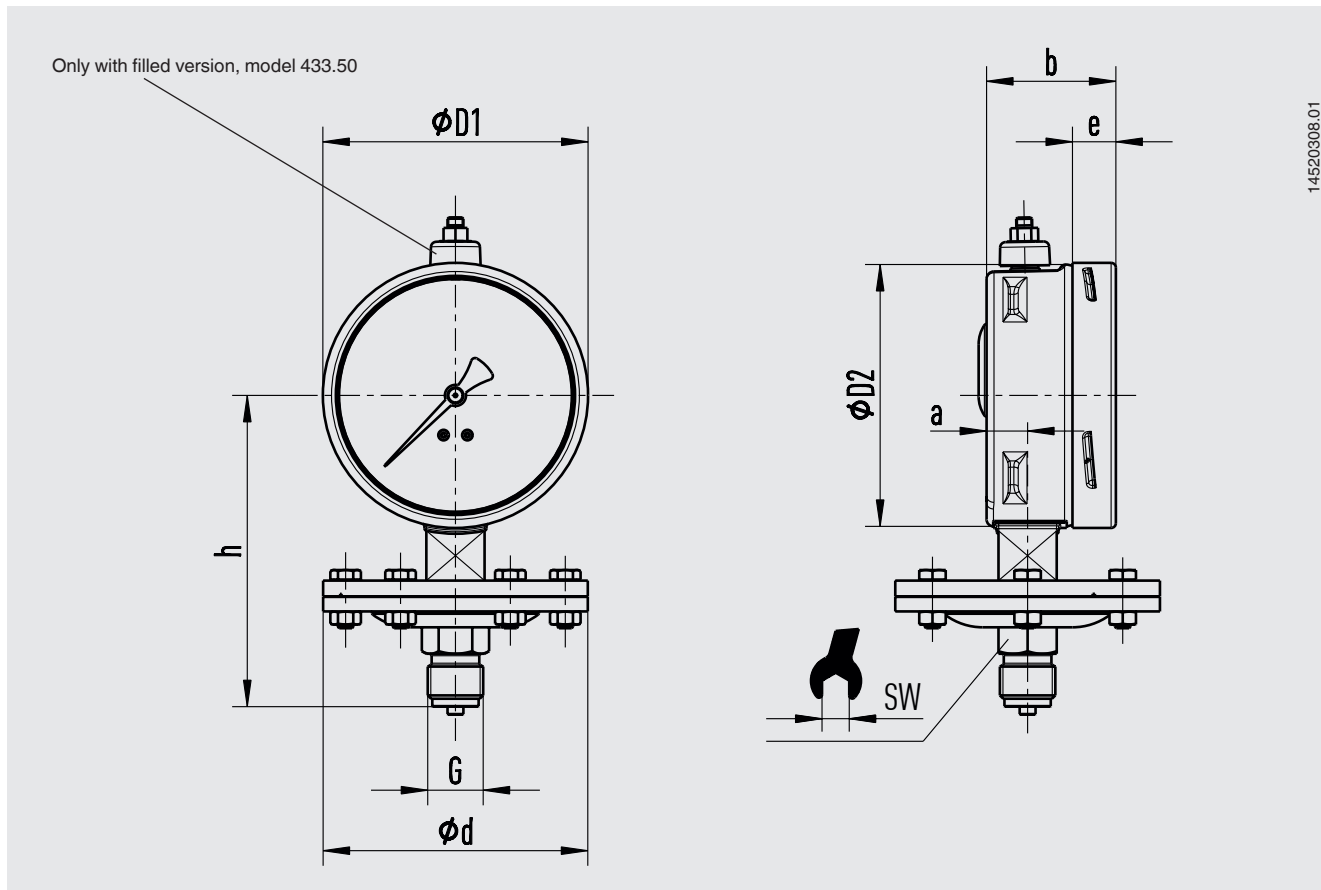
Certificates (option)

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)
Recommended recalibration interval	1 year (dependent on conditions of use)

For approvals and certificates, see website

Dimensions in mm [in]

Models 432.50 and 433.50



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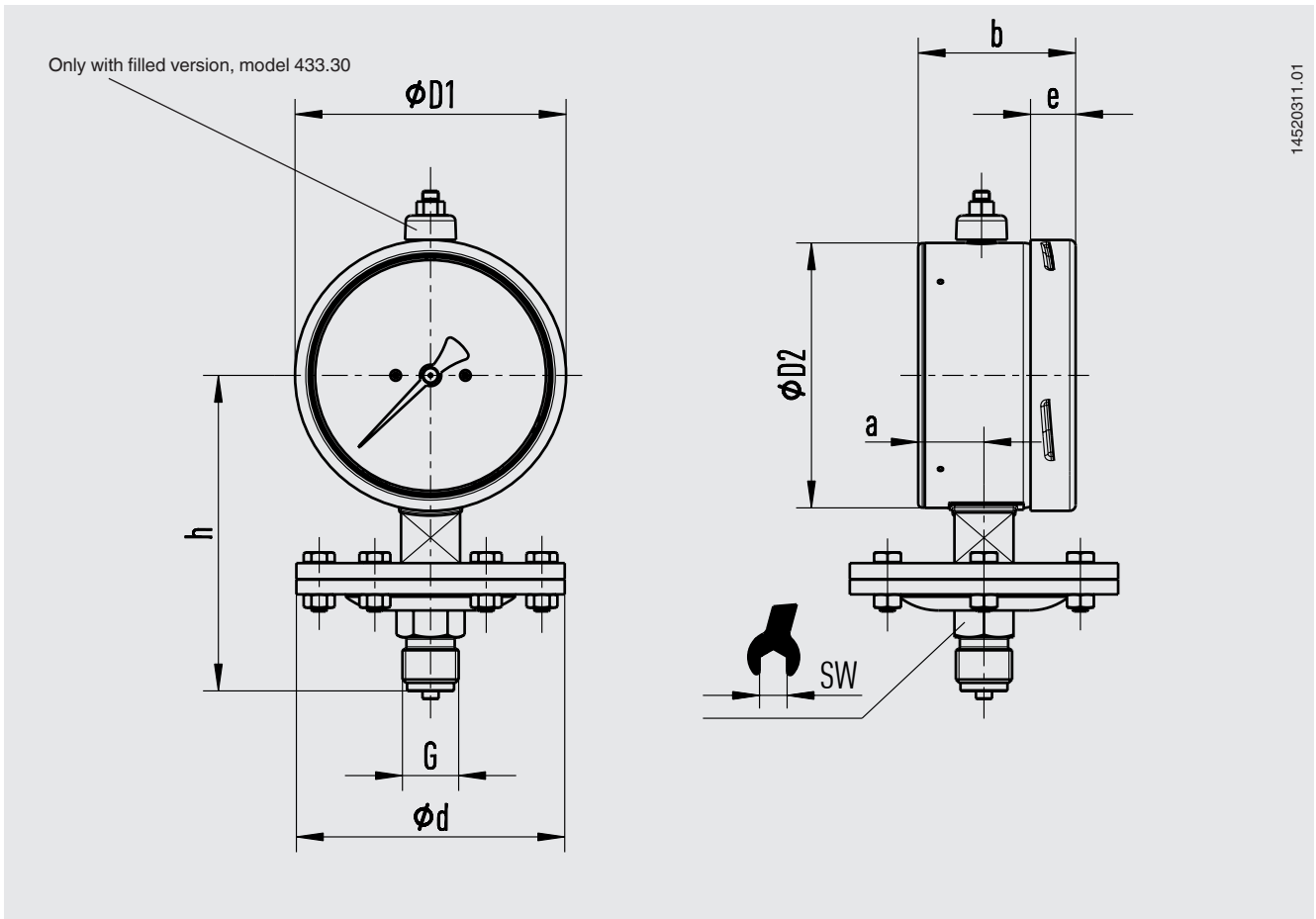
Nominal size 100 [4"]

Process connection G	Scale range	Dimensions in mm [in]								Weight in kg [lb]
		d	a	b	e	D1	D2	$h \pm 2$ [0.08]	SW	
G 1/2 B	≤ 0.25 bar [3.63 psi]	160 [6.3]	15.5 [0.61]	49.5 [1.95]	17.5 [0.69]	101 [3.98]	99 [3.90]	119 [4.69]	22 [0.87]	2.5 [5.5]
	> 0.25 bar [3.63 psi]	100 [3.94]	15.5 [0.61]	49.5 [1.95]	17.5 [0.69]	101 [3.98]	99 [3.90]	117 [4.61]	22 [0.87]	1.3 [2.9]
1/2 NPT	≤ 0.25 bar [3.63 psi]	160 [6.3]	15.5 [0.61]	49.5 [1.95]	17.5 [0.69]	101 [3.98]	99 [3.90]	118 [4.65]	22 [0.87]	2.5 [5.5]
	> 0.25 bar [3.63 psi]	100 [3.94]	15.5 [0.61]	49.5 [1.95]	17.5 [0.69]	101 [3.98]	99 [3.90]	116 [4.57]	22 [0.87]	1.3 [2.9]

Nominal size 160 [6"]

Process connection G	Scale range	Dimensions in mm [in]								Weight in kg [lb]
		d	a	b	e	D1	D2	$h \pm 2$ [0.08]	SW	
G 1/2 B	≤ 0.25 bar [3.63 psi]	160 [6.3]	15.5 [0.61]	49.5 [1.95]	17.5 [0.69]	161 [6.34]	159 [6.26]	149 [5.87]	22 [0.87]	2.9 [6.4]
	> 0.25 bar [3.63 psi]	100 [3.94]	15.5 [0.61]	49.5 [1.95]	17.5 [0.69]	161 [6.34]	159 [6.26]	147 [5.79]	22 [0.87]	1.7 [3.7]
1/2 NPT	≤ 0.25 bar [3.63 psi]	160 [6.3]	15.5 [0.61]	49.5 [1.95]	17.5 [0.69]	161 [6.34]	159 [6.26]	148 [5.83]	22 [0.87]	2.9 [6.4]
	> 0.25 bar [3.63 psi]	100 [3.94]	15.5 [0.61]	49.5 [1.95]	17.5 [0.69]	161 [6.34]	159 [6.26]	146 [5.75]	22 [0.87]	1.7 [3.7]

Models 432.30 and 433.30



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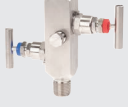


Nominal size 100 [4"]

Process connection G	Scale range	Dimensions in mm [in]								Weight in kg [lb]
		d	a	b	e	D1	D2	h ± 2 [0.08]	SW	
G ½ B	≤ 0.25 bar [3.63 psi]	160 [6.3]	24.5 [0.96]	59 [2.32]	17.5 [0.69]	101 [3.98]	99 [3.90]	119 [4.69]	22 [0.87]	2.5 [5.5]
	> 0.25 bar [3.63 psi]	100 [3.94]	24.5 [0.96]	59 [2.32]	17.5 [0.69]	101 [3.98]	99 [3.90]	117 [4.61]	22 [0.87]	1.3 [2.9]
½ NPT	≤ 0.25 bar [3.63 psi]	160 [6.3]	24.5 [0.96]	59 [2.32]	17.5 [0.69]	101 [3.98]	99 [3.90]	118 [4.65]	22 [0.87]	2.5 [5.5]
	> 0.25 bar [3.63 psi]	100 [3.94]	24.5 [0.96]	59 [2.32]	17.5 [0.69]	101 [3.98]	99 [3.90]	116 [4.57]	22 [0.87]	1.3 [2.9]

Nominal size 160 [6"]

Process connection G	Scale range	Dimensions in mm [in]								Weight in kg [lb]
		d	a	b	e	D1	D2	h ± 2 [0.08]	SW	
G ½ B	≤ 0.25 bar [3.63 psi]	160 [6.3]	27 [1.06]	65 [2.56]	17.5 [0.69]	161 [6.34]	159 [6.26]	149 [5.87]	22 [0.87]	2.9 [6.4]
	> 0.25 bar [3.63 psi]	100 [3.94]	27 [1.06]	65 [2.56]	17.5 [0.69]	161 [6.34]	159 [6.26]	147 [5.79]	22 [0.87]	1.7 [3.7]
½ NPT	≤ 0.25 bar [3.63 psi]	160 [6.3]	27 [1.06]	65 [2.56]	17.5 [0.69]	161 [6.34]	159 [6.26]	148 [5.83]	22 [0.87]	2.9 [6.4]
	> 0.25 bar [3.63 psi]	100 [3.94]	27 [1.06]	65 [2.56]	17.5 [0.69]	161 [6.34]	159 [6.26]	146 [5.75]	22 [0.87]	1.7 [3.7]

Accessories and spare parts

Model	Description	Order number
	910.33 Adhesive label set for red and green circular arcs → See data sheet AC 08.03	-
	NS 100 [4"]	14238945
	NS 160 [6"]	14228352
	910.17 Sealings → See data sheet AC 09.08	On request
	910.15 Syphons → See data sheet AC 09.06	On request
	910.13 Overpressure protector → See data sheet AC 09.04	On request
	IV20, IV21 Block-and-bleed valve → See data sheet AC 09.19	On request
	IBF2, IBF3 Monoblock with flange connection → See data sheet AC 09.25	On request
	910.16 Mounting parts for wall and pipe mounting Instrument mounting bracket and adapter piece → See data sheet AC 09.07	On request

Ordering information

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

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