

Differential pressure gauge

For the process industry, all-metal media chamber

Models 732.14, 733.14, 762.14 and 763.14

WIKA data sheet PM 07.13



For further approvals,
see page 8

Applications

- For gaseous and liquid aggressive media that are not highly viscous or crystallising, also in aggressive environments
- Pump monitoring and control
- Filter monitoring
- Level measurement on closed vessels

Special features

- Differential pressure measuring ranges from -1 ... +30 bar [-14.5 ... 435 psi] to 0 ... 40 bar [0 ... 580 psi]
- High working pressure (static pressure) and high overload safety, selectable 40 bar [580 psi], 100 bar [1,450 psi], 250 bar [3,625 psi], 400 bar [5,800 psi] and 650 bar [9,425 psi]
- The transmission fluid in the measuring chamber dampens the indicator in case of high changes of the rate of pressure
- Model 76x.14: Monel version



Differential pressure gauge model 732.14

Description

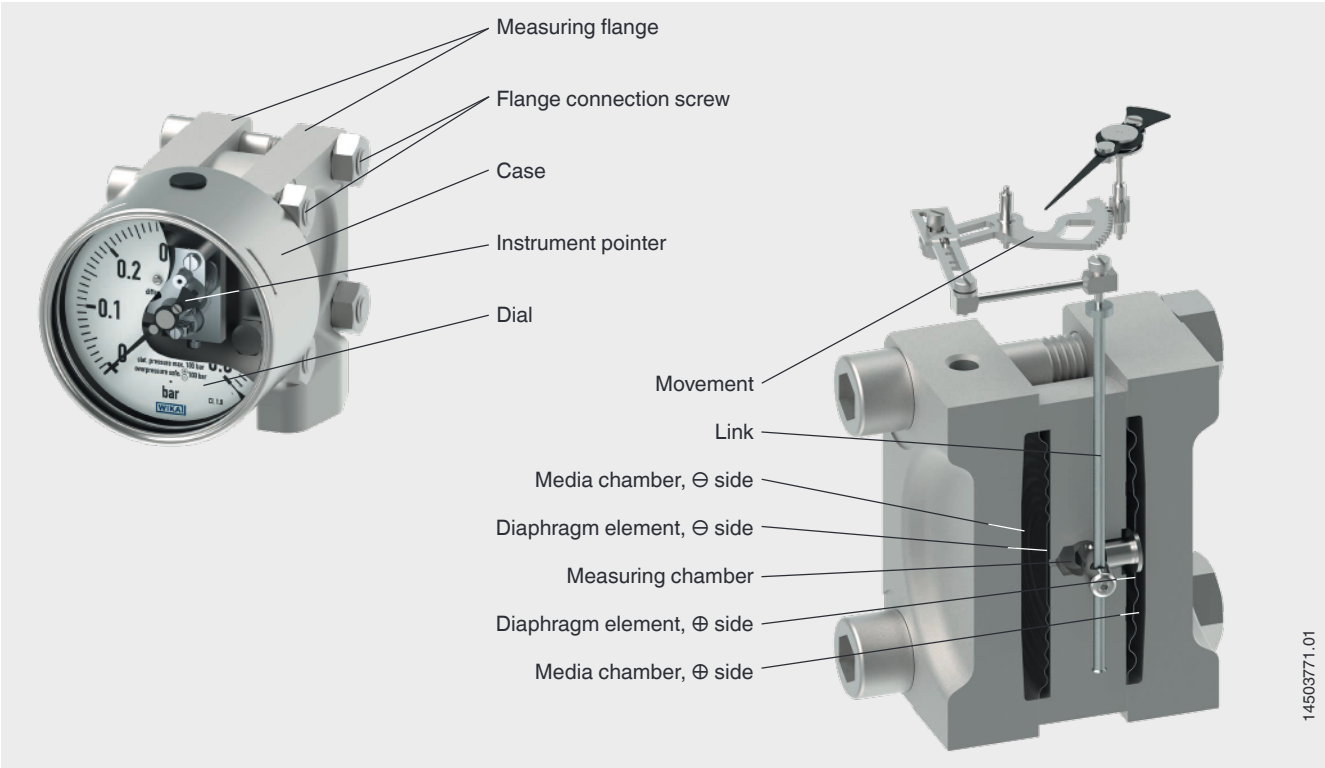
These differential pressure gauges are made of highly corrosion-resistant stainless steel. A high overload safety is achieved by the all-metal construction and the close-fitting design of the diaphragm measuring element.

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.

The wetted parts for these instruments are also available in special materials such as Monel or Hastelloy.

Scale ranges of 0 ... 60 mbar to 0 ... 40 bar [0 ... 0.87 to 0 ... 580 psi] ensure the measuring ranges required for a wide variety of applications.

Functionality



Design and operating principle

- Pressures p1 and p2 act on the ⊕ and ⊖ sides of the measuring chamber.
- The media chambers are separated from the transmission fluid-filled measuring chamber by one diaphragm element each.
- The pressure difference between ⊕ and ⊖ sides deflects the diaphragm of the ⊕ side and displaces the transmission fluid.
- The deflection is transmitted to the movement via the link.
- The movement converts the deflection into a pointer rotation.

Overload safety

Through load take-up points with metallic seating for the diaphragm elements, the instrument can withstand extremely high working pressures with pressure ratings of PN 40 ... PN 650 (40 ... 650 bar [580 ... 9,425 psi]).

Overview of versions

Model	Material of wetted parts		With case filling
	<ul style="list-style-type: none"> Stainless steel 316L Stainless steel 316L + NiCr alloy (Inconel) Hastelloy C276 	<ul style="list-style-type: none"> Monel 2.4360 Monel 2.4360 + Hastelloy C276 	
732.14	x		
733.14	x		x
762.14		x	
763.14		x	x

The above-mentioned versions can, optionally, be ordered with Ex approval.

→ For approvals and certificates, see page 7

Specifications

Basic information	
Standard	
EN 837-3	Diaphragm and capsule pressure gauges, dimensions, metrology, requirements and testing
DIN 16003	Pressure measuring instruments for differential pressure
→ 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
Connection location	Lower mount (radial)
	Other connection locations on request
Case	
Design	Safety level “S1” per EN 837-1: With blow-out device
Material	Stainless steel 1.4404 (316L) Stainless steel 1.4571 (316Ti)
Case filling	<ul style="list-style-type: none"> ■ Without ■ Glycerine-water mixture ■ Silicone oil
	Instruments with case filling with compensating valve to vent case.
Venting of the media chambers	
Span ≤ 0.25 bar [3.63 psi]	With venting
Span > 0.25 bar [3.63 psi]	<ul style="list-style-type: none"> ■ Without ■ With venting
Movement	Stainless steel

1) Ingress protection IP65 for instruments with case filling

Measuring element		
Type of measuring element	2 diaphragm elements with transmission fluid	
Material		
Diaphragm element, model 732.14 and 733.14	Span ≤ 0.25 bar [3.63 psi]	<div>■ Stainless steel 316L</div> <div>■ Hastelloy C276</div>
	Span > 0.25 bar [3.63 psi]	<div>■ Stainless steel 316L / NiCr alloy (Inconel)</div> <div>■ Hastelloy C276</div>
Diaphragm element, model 762.14 and 763.14	<div>■ Monel 2.4360</div> <div>■ Hastelloy C276 ¹⁾</div>	

1) Requirement for design per NACE MR0175 / ISO 15156

Accuracy specifications	
Accuracy class	<ul style="list-style-type: none"> ■ 1.6 ■ 2.5 ■ 1.0 (application test required)
Zero point setting	
Instruments with case filling	<ul style="list-style-type: none"> ■ Without ■ External setting
Instruments without case filling	<ul style="list-style-type: none"> ■ Without ■ Setting by means of adjustable pointer
Influence of static pressure	Depending on scale range and pressure rating → See separate table

Accuracy specifications	
Temperature error	On deviation from the reference conditions at the measuring system: $\leq \pm 0.5\%$ per 10 °C [$\leq \pm 0.5\%$ per 18 °F] of full scale value
Reference conditions	
Ambient temperature	+20 °C [+68 °F]

Static pressure influence

Span	Measuring deviation based on the static pressure in % per 10 bar ^{1) 2)}				
	PN 40	PN 100	PN 250	PN 400	PN 650
0.06 ... 0.16 bar [0.9 ... 2.3 psi]	$\leq \pm 0.125$	$\leq \pm 0.1$	$\leq \pm 0.12$	-	-
0.25 bar [3.6 psi]	$\leq \pm 0.125$	$\leq \pm 0.15$	-	-	-
0.4 bar [5.8 psi]	$\leq \pm 0.125$	$\leq \pm 0.1$	$\leq \pm 0.1$	-	-
0.6 ... 40 bar [8.7 ... 580 psi]	$\leq \pm 0.125$	$\leq \pm 0.1$	$\leq \pm 0.06$	$\leq \pm 0.063$	$\leq \pm 0.038$

1) Other measuring deviations for special material Monel or Hastelloy possible

2) Definition static pressure influence per DIN 16003

Scale ranges

mbar	
0 ... 60	0 ... 1,000
0 ... 100	0 ... 1,100
0 ... 160	0 ... 1,200
0 ... 250	0 ... 1,600
0 ... 400	0 ... 2,500
0 ... 600	-

psi	
0 ... 10	0 ... 200
0 ... 15	0 ... 250
0 ... 30	0 ... 300
0 ... 60	0 ... 400
0 ... 100	0 ... 500
0 ... 150	0 ... 600
0 ... 160	-

bar	
0 ... 0.25	0 ... 7
0 ... 0.4	0 ... 10
0 ... 0.6	0 ... 14
0 ... 1	0 ... 16
0 ... 1.6	0 ... 20
0 ... 2.5	0 ... 25
0 ... 4	0 ... 30
0 ... 6	0 ... 40

kPa	
0 ... 6	0 ... 300
0 ... 10	0 ... 400
0 ... 16	0 ... 600
0 ... 25	0 ... 700
0 ... 40	0 ... 800
0 ... 60	0 ... 1,000
0 ... 70	0 ... 1,400
0 ... 100	0 ... 1,600
0 ... 160	0 ... 2,500
0 ... 200	0 ... 3,000
0 ... 250	0 ... 4,000

Vacuum and +/- scale ranges

mbar	
-60 ... 0	-10 ... +50
-100 ... 0	-20 ... +80
-160 ... 0	-40 ... +120
-250 ... 0	-50 ... +50
-400 ... 0	-50 ... +200
-600 ... 0	-80 ... +80
-1,000 ... 0	-100 ... +150
-1,100 ... 0	-200 ... +600
-1,200 ... 0	-500 ... +500

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

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

kPa	
-60 ... 0	-100 ... +200
-100 ... 0	-100 ... +300
-2 ... +4	-100 ... +400
-4 ... +6	-100 ... +500
-6 ... +10	-100 ... +700
-10 ... +15	-100 ... +900
-15 ... +15	-100 ... +1,000
-100 ... +100	-100 ... +1,500
-100 ... +150	-100 ... +2,400

Other scale ranges on request

Further details on: Scale ranges			
Unit	<input type="checkbox"/> mbar		<input type="checkbox"/> mmH ₂ O
	<input type="checkbox"/> bar		<input type="checkbox"/> inH ₂ O
	<input type="checkbox"/> psi		<input type="checkbox"/> kg/cm ²
	<input type="checkbox"/> kPa		<input type="checkbox"/> oz/cm ²
	<input type="checkbox"/> MPa		
	Other units on request		
Overload safety and max. working pressure (static pressure)			
Pressure ratings PN 40 ... PN 400	Max. 40, 100, 250 or 400 bar [580, 1,450, 3,625 or 5,800 psi] On one, both and alternatingly on the ⊕ and ⊖ sides		
Pressure rating PN 650	Max. 400 bar [5,800 psi] on one side and alternatingly on the ⊕ und ⊖ sides Max. 650 bar [9,425 psi] on both sides on the ⊕ and ⊖ sides		
Dial			
Scale layout	<input type="checkbox"/> Single scale <input type="checkbox"/> Dual scale		
Scale colour	Single scale	Black	
	Dual scale	Black/red	
Material	Aluminium		
Customer-specific version	<input type="checkbox"/> Without		
	<input type="checkbox"/> With special scale, e.g. linear pressure or square root incrementation		
	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		
Pointer			
Instrument pointer	With case filling	Standard pointer, aluminium, black	
	Without case filling	Adjustable pointer, aluminium, black	
Mark pointer/drag pointer	<input type="checkbox"/> Without <input type="checkbox"/> Mark pointer on bayonet ring, adjustable		
Pointer stop pin	<input type="checkbox"/> Without		
	<input type="checkbox"/> At 6 o'clock		

Process connection	
Standard	<ul style="list-style-type: none"> ■ EN 837-1 ■ ANSI/B1.20.1 ■ EN 61518 → For valve manifolds for an instrument hook-up, see "Accessories and spare parts".
Size	
EN 837-1	<ul style="list-style-type: none"> ■ 2 x G ½, female thread ■ 2 x G ½ B, male thread
ANSI/B1.20.1	2 x ½ NPT, male thread
EN 61518	Flange with differential pressure connection
Restrictor	<ul style="list-style-type: none"> ■ Without ■ Ø 0.6 mm [0.024"], stainless steel ■ Ø 0.3 mm [0.012"], stainless steel

Other process connections on request

Material		
Material (wetted)		
Measuring flanges with process connection	Model 732.14 and 733.14	■ Stainless steel 316L ■ Hastelloy C276
	Model 762.14 and 763.14	Monel 2.4360
Sealing	FPM/FKM	
Venting of the media chambers	Model 732.14 and 733.14	■ Stainless steel 316L ■ Hastelloy C276
	Model 762.14 and 763.14	Monel 2.4360
Diaphragm element, model 732.14 and 733.14	Span ≤ 0.25 bar [3.63 psi]	■ Stainless steel 316L ■ Hastelloy C276
	Span > 0.25 bar [3.63 psi]	■ Stainless steel 316L ■ NiCr alloy (Inconel) ■ Hastelloy C276
Diaphragm element, model 762.14 and 763.14	■ Monel 2.4360 ■ Hastelloy C276	
Material (in contact with the environment)		
Flange connecting screws	PN 40 ... PN 100	Stainless steel
	PN 250 ... PN 650	Steel, corrosion-protected
Measuring chamber	Stainless steel, stainless steel/Monel, stainless steel/Hastelloy C276	
Case	Stainless steel, safety level “S1” per EN 837: With blow-out device	
Movement, bayonet ring	Stainless steel	
Dial	Aluminium, white, black lettering	
Window	Laminated safety glass	

Operating conditions	
Medium temperature range	<ul style="list-style-type: none"> ■ -20 ... 100 °C [-4 ... +212 °F] ■ +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	-20 ... +60 °C [-4 ... 140 °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 (application test required)

1) Only selectable in combination with silicone oil case filling

2) Ingress protection IP65 for instruments with case filling

Other versions

- Oil- and grease-free
- For oxygen, oil- and grease-free
- For hydrogen ¹⁾
- Silicone-free
- Per NACE ²⁾ MR 0175 / ISO 15156, use in H₂S-containing environments in oil and gas production
- Per NACE ²⁾ MR 0103 / ISO 17945, metals resistant to sulfide stress cracking
- With pre-volume deflagration flame arrester ³⁾ for connection to zone 0 (EPL Ga); model 910.21; see data sheet AC 91.02
- Differential pressure gauge with switch contacts, high overload safety, model DPGS43HP; see data sheet PV 27.13
- Differential pressure gauge with electrical output signal, high overload safety, model DPGT43HP ; see data sheet PV 17.13

1) Only with gold-plated diaphragm element and application-specific test

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

3) Only for instruments with Ex approval