# Differential pressure gauge
# For the process industry, all-metal media chamber
# Models 732.31 and 732.51



for further approvals
see page 5

## 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 0 … 16 mbar [0.23 psi]
- High working pressure (static pressure) up to 40 bar [580 psi]
- High overload safety up to 40 bar [580 psi]
- Model 73x.31: Case with safety level “S3” per EN 837
- All-welded media chamber


**Differential pressure gauge model 732.51**

## Description

These differential pressure gauges are made of highly corrosion-resistant stainless steel and feature an all-metal media chamber to ensure long-term leak tightness (no elastomer sealing elements).

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 optionally available low-temperature version allows use at temperatures of down to -70 °C [-94 °F].

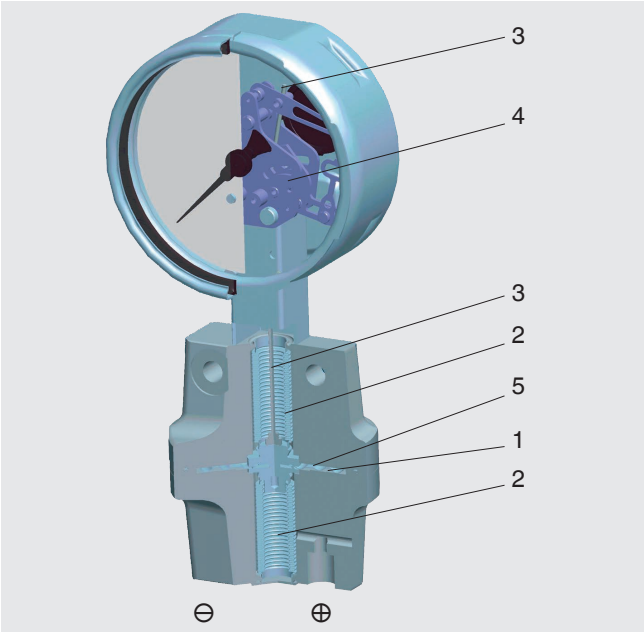
The safety version is made up of a non-splintering window, a solid baffle wall between measuring system and dial and a blow-out back. In the event of a failure, the operator is protected at the front side, as media or components can only be ejected via the back of the case.

Scale ranges of 0 ... 16 mbar to 0 ... 25 bar
[0 ... 0.23 to 0 ... 363 psi] ensure the measuring ranges required for a wide variety of applications.



Data sheets showing similar products:
Differential pressure gauge, high overload safety up to 40, 100 or 400 bar; model 732.14; see data sheet PM 07.13

## Illustration of the principle




Mounting according to affixed symbols, ⊕ high pressure and ⊖ low pressure

## Design and operating principle

- Media chambers of the ⊕ and ⊖ side are separated by the diaphragm element (1)
- Metal bellows (2) isolate the media chambers from the atmosphere
- The pressure differential between ⊕ and ⊖ side leads to an axial pressure element deflection
- The deflection is transmitted to the movement (4) via the link (3)
- The movement converts the deflection into a pointer rotation
- Overpressure safety is ensured by the all-metal construction and the close-fitting all-metal design (5)

## Specifications

| Models 732.31 and 732.51 | |
|---|---|
| **Design** | Differential pressure gauges per DIN 16003, lower mount process connections, highly corrosion-resistant all-metal design, instrument protected against unauthorised intervention, position of process connection adjustable to mounting conditions<br><br>■ Models 733.31 and 733.51: Version with liquid filling<br>■ Model 73x.31: Case with safety level “S3” per EN 837: With solid baffle wall and blow-out back<br>■ Version with switch contacts [1]<br>■ Version with output signal [2] |
| **Nominal size in mm** | ■ 100<br>■ 160 |
| **Accuracy class** | ■ 1.6<br>■ 1.0<br>■ 2.5 |
| **Scale ranges** | ■ 0 ... 16 mbar to 0 ... 25 bar [0 ... 0.23 to 0 ... 363 psi] |
| **Scale** | ■ Single scale<br>■ Dual scale<br>■ Special scale (e.g. linear pressure or square root incrementation)<br>Scale angle approx. 180° for scale range 0 ... 16 mbar [0 ... 0.23 psi], with all other scale ranges the scale angle is 270°. |
| **Zero point setting** | ■ External setting, for instruments with liquid filling [3]<br>■ Setting by means of adjustable pointer, for instruments without liquid filling |
| **Pressure limitation** | |
| Steady | Full scale value |
| Fluctuating | 0.9 x full scale value |

1) Models DPGS43.100, DPGS43.160; see data sheet PV 27.05
2) Models DPGT43.100, DPGT43.160; see data sheet PV 17.05
3) Except for model 733.31, setting possible by means of adjustable pointer

| Models 732.31 and 732.51 | |
|---|---|
| **Overload safety and max. working pressure (static pressure)** | see table on page 4 |
| **Static pressure influence** | ■ ±0.3 %/1 bar [14.5 psi] for scale ranges 0 ...16 to 0 ... 250 mbar [0 ... 0.2 to 0 ... 3.63 psi]<br>■ ±0.04 %/1 bar [14.5 psi] for scale ranges 0 ... 400 mbar to 0 ... 25 bar [0 ... 5.8 to 0 ... 363 psi] |
| **Connection location** | ■ Lower mount (radial)<br>■ Other connection location on request |
| **Process connection** | ■ 2 x G ¼ female thread<br>■ 2 x G ½ B<br>■ 2 x G 1/NPT male thread |
| **Permissible temperature** | |
| Medium | ■ -20 ... +100 °C [-4 ... +212 °F]<br>■ -20 ... +120 °C [-4 ... +248 °F]<br>■ -20 ... +150 °C [-4 ... +284 °F] |
| Ambient | ■ -20 ... +60 °C [-4 ... +140 °F] for instruments without liquid filling<br>■ -40 … +60 °C [-40 ... +140 °F] with silicone oil filling (only for models 733.31 and 733.51) |
| **Temperature effect** | When the temperature of the measuring system deviates from the reference temperature (+20 °C [68 °F]): max. ±0.5 %/10 K of full scale value |
| **Materials (wetted)** | |
| Media chambers with process connection | Stainless steel 1.4571 |
| Pressure element | ■ ≤ 0.25 bar [3.63 psi]: Stainless steel 1.4571<br>■ > 0.25 bar [3.63 psi]: NiCr alloy (Inconel) |
| Bellows | Stainless steel 1.4571 |
| Venting of the media chambers | Stainless steel 1.4571<br>For scale ranges ≤ 0.25 bar [3.63 psi], venting of the media chambers is always provided.<br>For scale ranges > 0.25 bar [3.63 psi], venting of the media chambers can be ordered. |
| **Materials (non-wetted)** | |
| Case | Stainless steel, safety level “S1” per EN 837: With blow-out device |
| Movement, bayonet ring | Stainless steel |
| Dial | Aluminium, white, black lettering |
| Instrument pointer | ■ Model 732.51: Adjustable pointer, aluminium, black<br>■ Model 733.51: Standard pointer, aluminium, black |
| Window | Laminated safety glass |
| **Ingress protection per IEC/EN 60529** | ■ IP54<br>■ IP65 for instruments with liquid filling |
| **Mounting** | Mounting by means of:<br>■ Rigid measuring lines<br>■ Mounting holes with measuring flange |

## Overload safety and max. working pressure

| Scale ranges | Overload safety in bar<br>Either side max. | Max. working pressure in bar<br>(static pressure) |
|---|---|---|
| **0 ... 16 to 0 ... 40 mbar<br>[0 ... 0.23 to 0 ... 0.58 psi]** | 2.5 [36.3 psi] | ■ 2.5 [36.3 psi]<br>■ 6 [87 psi] 1) |
| **0 ... 60 to 0 ... 250 mbar<br>[0 ... 0.87 to 0 ... 3.6 psi]** | ■ 2.5 [36.3 psi]<br>■ 6 [87 psi] | ■ 6 [87 psi]<br>■ 10 [145 psi] |
| **0 ... 400 mbar [0 ... 5.8 psi]** | ■ 4 [58 psi]<br>■ 40 [580 psi] | ■ 25 [363 psi]<br>■ 40 [580 psi] |
| **0 ... 0.6 bar [0 ... 8.7 psi]** | ■ 6 [87 psi]<br>■ 40 [580 psi] | ■ 25 [363 psi]<br>■ 40 [580 psi] |
| **0 ... 1 bar [0 ... 14.5 psi]** | ■ 10 [145 psi]<br>■ 40 [580 psi] | ■ 25 [363 psi]<br>■ 40 [580 psi] |
| **0 ... 1.6 bar [0 ... 23.2 psi]** | ■ 16 [232 psi]<br>■ 40 [580 psi] | ■ 25 [363 psi]<br>■ 40 [580 psi] |
| **0 ... 2.5 to 0 ... 25 bar<br>[0 ... 36.3 to 0 ... 363 psi]** | ■ 25 [363 psi]<br>■ 40 [580 psi] | ■ 25 [363 psi]<br>■ 40 [580 psi] |

1) Accuracy class 2.5

## Approvals

| Logo | Description | Country |
|---|---|---|
| CE<br>Ex | **EU declaration of conformity**<br>ATEX directive (option)<br>Ignition protection type “c”, constructive safety | European Union |
| EAC Ex | **EAC (option)**<br>Hazardous areas | Eurasian Economic Community |
| | **GOST (option)**<br>Metrology, measurement technology | Russia |
| | **KazInMetr (option)**<br>Metrology, measurement technology | Kazakhstan |
| - | **MTSCHS (option)**<br>Permission for commissioning | Kazakhstan |
| | **BelGIM (option)**<br>Metrology, measurement technology | Belarus |
| | **UkrSEPRO (option)**<br>Metrology, measurement technology | Ukraine |
| - | **CPA (option)**<br>Metrology, measurement technology | China |
| Ks | **KCs KOSHA (option)**<br>Hazardous areas | South Korea |
| - | **CRN**<br>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. material proof for wetted metal parts, indication accuracy)

Approvals and certificates, see website

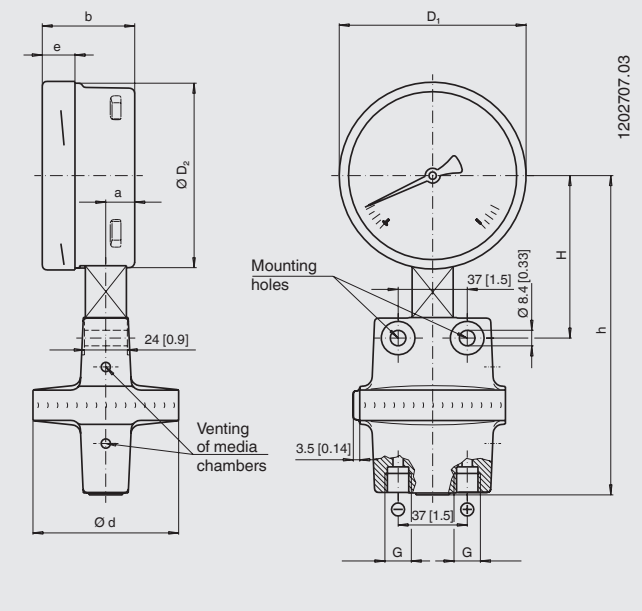
## Accessories

- Sealings (model 910.17, see data sheet AC 09.08)
- Valve manifolds (models IV3x, IV5x, see data sheet AC 09.23)
- Panel mounting flange
- Instrument mounting bracket for wall or pipe mounting

# Dimensions in mm [in]

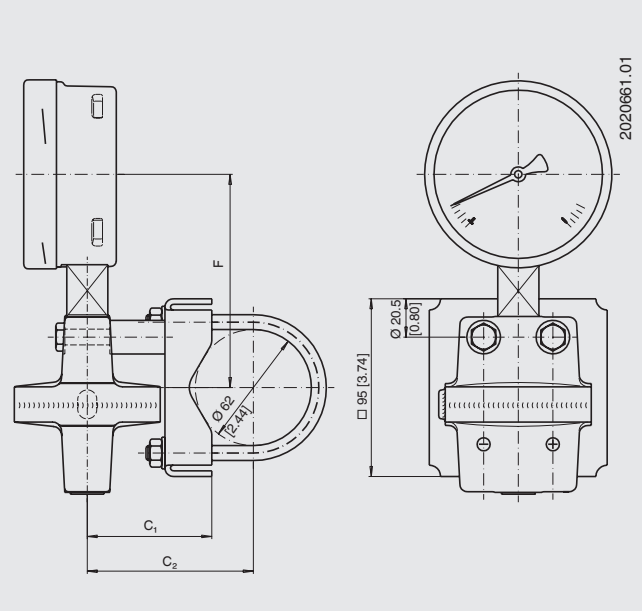
### Standard version

Connection 2 x G ¼ female thread, lower mount




### Accessories

Instrument mounting bracket for wall or pipe mounting




| NS | Scale range | Dimensions in mm [in] | | | | | | | | | | | Weight in kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a[1] | b[2] | $D_1$ | $D_2$ | d | e | G | h ±1 | H | F | $C_1$ | $C_2$ | |
| **100** | ≤ 0.25 bar [3.63 psi] | 15.5 [0.61] | 49.5 [1.95] | 101 [3.98] | 99 [3.90] | 140 [5.51] | 17.5 [0.69] | G ¼ | 160 [6.30] | 90 [3.54] | 114 [4.49] | 96 [3.78] | 118 [4.65] | 2.70 |
| **100** | > 0.25 bar [3.63 psi] | 15.5 [0.61] | 49.5 [1.95] | 101 [3.98] | 99 [3.90] | 78 [3.07] | 17.5 [0.69] | G ¼ | 170 [6.69] | 87 [3.43] | 114 [4.49] | 66 [2.60] | 88 [3.46] | 1.90 |
| **160** | ≤ 0.25 bar [3.63 psi] | 15.5 [0.61] | 49.5 [1.95] | 161 [6.34] | 159 [6.26] | 140 [5.51] | 17.5 [0.69] | G ¼ | 190 [7.48] | 120 [4.72] | 144 [5.67] | 96 [3.78] | 118 [4.65] | 3.40 |
| **160** | > 0.25 bar [3.63 psi] | 15.5 [0.61] | 49.5 [1.95] | 161 [6.34] | 159 [6.26] | 78 [3.07] | 17.5 [0.69] | G ¼ | 200 [7.87] | 117 [4.61] | 144 [5.67] | 66 [2.60] | 88 [3.46] | 2.40 |

1) For model 733.31, this dimension is 23.5 mm [0.9 in] for both nominal sizes
2) For model 733.31, this dimension is 59 mm [2.3 in] for both nominal sizes

Process connection per DIN 16003

Other versions on request.

### Ordering information

Model / Nominal size / Scale range / Scale layout (linear pressure or square root incrementation) / Max. working pressure (static pressure) ... bar / Process connection / Connection location / Options





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