# Diaphragm pressure gauges with electrical alarm contacts in stainless steel case

**with or without dampening**

**with magnetic snap-action contacts or inductive alarm contacts**

**Nominal sizes ND 100, 160**

**Connection position bottom, radial**

## Description

The design principle and material selection of the diaphragm pressure gauges allow them to meet the stringent demands occurring above all in industrial service.
Special corrosion resistant materials are used for service with chemically aggressive media.
Open process connections ensure that the gauges are easy to clean with highly viscous or crystallizing process media, thus guaranteeing process reliability.
As a result of the high actuating forces, pressure gauges with diaphragms are particularly suitable for connection of electric alarm contacts. Electric alarm contacts open and close circuits in response to the position of the pressure gauge pointer.

Magnetic snap-action electric alarm contacts are used in adverse operating conditions. The high contact pressure and the selection of various contact materials result in reliable and cost-effective solutions, above all when high currents have to be switched. Signal output does however take place slightly in advance of or lagging slightly behind the motion of the actual value pointer.

**If the electrical switching capacities of the alarm contacts are exceeded or not reached** (see DE 1231), **a relay** (DE 1230) **is to be used to provide an appropriate current rating.**

Inductive electric alarm contacts have an almost unlimited service life, as the signal is switched without physical contact. Closing or opening takes place without any feedback effect on the measuring system, precluding any signal lead or lag. A corresponding control unit is always required for operation. Units with inductive contacts may be operated in areas with potentially explosive atmospheres, assuming compliance with existing specifications.

## Features

- o Limit value signalling by magnetic snap-action or inductive contacts
- o With SVA-amplifier suitable for SPS control units
- o Up to four alarm contacts possible
- o Can be used under Ex-conditions with inductive alarm contacts
- o Liquid dampening provides vibration-free display
- o Up to 10-fold overload capacity
- o Protection class IP 54 resp. IP 65

## Ranges

0 ... 25 mbar to 0 ... 40 bar

## Applications

Mechanical engineering,

plant and apparatus construction,

Building services

**Model : P1651, P1831, P1653, P1833, P1661, P1841, P1663, P1843**

## Technical data

| Model | P1651 | P1831 | P1653 | P1833 | P1661 | P1841 | P1663 | P1843 | Options |
|---|---|---|---|---|---|---|---|---|---|
| Nominal size | 100 | | | | 160 | | | | |
| Symbol |  | | | | | | | | |
| Contact type | Magnetic snap action | | Inductive | | Magnetic snap action | | Inductive | | |
| Number of contacts * | 1 to 4 depending on measuring range | | 1 to 3 depending on measuring range | | 1 to 4 depending on measuring range | | 1 to 3 depending on measuring range | | |
| Liquid filling | --- | Ester oil | --- | Ester oil | --- | Ester oil | --- | Ester oil | |
| Electrical connection | Cable connector right hand side<br>6 screw terminals + PE, cross section of the conducting wire 2.5 $mm^2$<br>Screw type conduit fitting M20x1.5, outgoing downwards | | | | | | | | back (withhout pressure relief opening) |
| Accuracy class | Class 1.6 according EN 837-3<br>Class 2.5 with liquid filling and ranges from 0...25 to 0...100 mbar | | | | | | | | |
| Ranges | 0...25 mbar to 0...250 mbar : flange ∅ 160 mm<br>0...0.4 bar to 0...40 bar : flange ∅ 100 mm<br>negative or positive or negative and positive gauge pressure | | | | | | | | |
| Application | Constant load : up to full scale value<br>Alternating load : 0.9 x full scale vaue | | | | | | | | |
| Overload protection | ≤ 0.4 bar : 5 x full scale value<br>> 0.4 bar to ≤ 2.5 bar : 3 x full scale value<br>> 2.5 bar : 5 x full scale value, max. 40 bar | | | | | | | | overloadable: 10x full scale value, max. 40 bar.<br>vacuum proof to -1 bar |
| Case | Stainless steel | | | | | | | | |
| Upper flange | Steel, black | | | | | | | | |
| Connection with lower flange<br>- Position | steel, black<br>bottom, radial | | | | | | | | |
| - Thread | G1/2 B, SW 22 | | | | | | | | other threads or open flanges on request |
| Bezel | Stainless steel, bayonet ring | | | | | | | | |
| Window | Plexiglass | | | | | | | | Laminated safety glass |
| Dial | Aluminium, white, scale and lettering black | | | | | | | | Dual scale |
| Pointer | Aluminium, black | | | | | | | | |
| Movement | copper-alloy, bearing parts German silver | | | | | | | | |
| Elastic measuring element | ≤ 2.5 bar : stainless steel 1.4571<br>> 2.5 bar : stainless steel (Duratherm 600) | | | | | | | | |
| Seal to pressure chamber and filled internal chamber | NBR (Perbunan) | | | | | | | | FPM (Seals made of Viton®) [1]<br>or PTFE |
| Temperatures<br>- medium<br>- ambient | Tmin. -20°C , Tmax. 100° C<br>Tmin. -20°C , Tmax. 60° C | | | | | | | | |
| Temperature drift | 0.5% / 10K deviation of normal temperature +20°C | | | | | | | | |
| Protection EN 60 529/ IEC 259 | IP 54 | IP 65 | IP 54 | IP 65 | IP 54 | IP 65 | IP 54 | IP 65 | |
| Components in contact with medium | see process connection with lower flange and elastic measuring element | | | | | | | | Special materials on request |
| Orifice | | | | | | | | | ø0.4 ; ø0.8 |

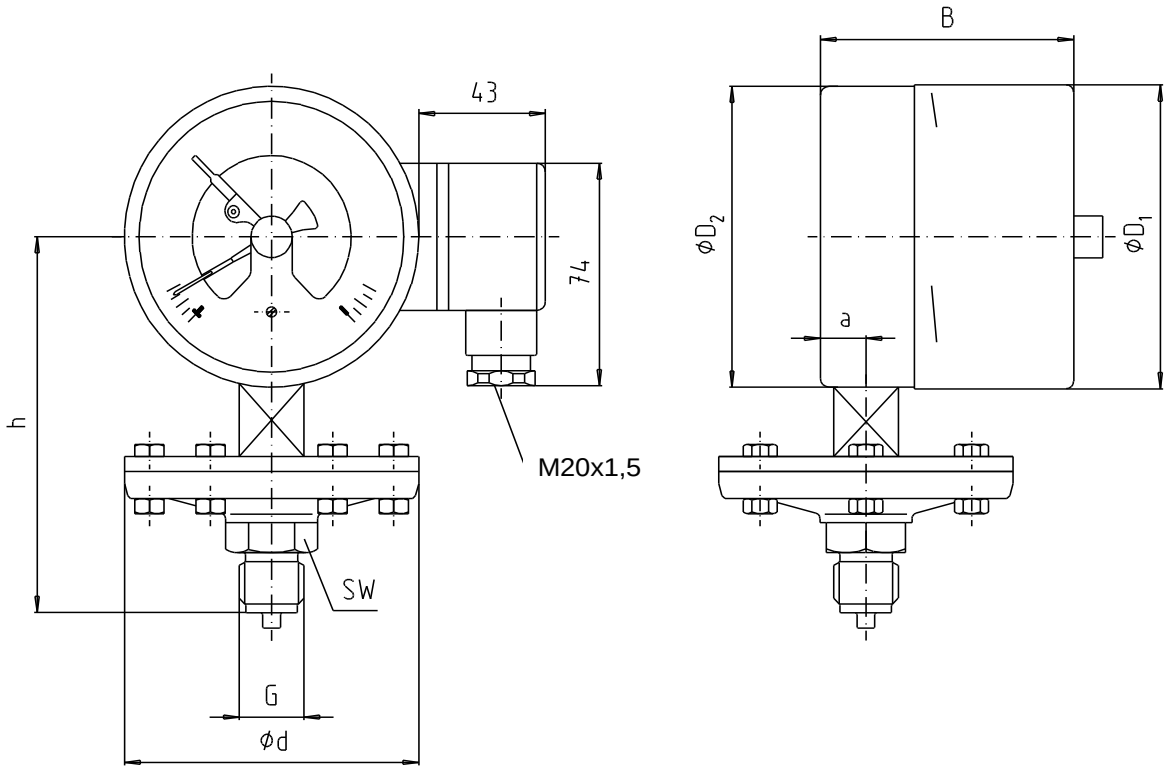
[1] Viton® fluoroelastomer, a product of DuPont Dow Elastomers

*** Max. number of contacts**

| Measuring range | Magnetic snap-action contact | Inductive contact |
|---|---|---|
| 25 mbar | 2 | 2 |
| 40 mbar to 160 mbar | 3 | 3 |
| above 250 mbar | 4 | 3 |

See data sheet DE 1231 for electrical data.
See data sheet DE 1230 for electrical accessories.

## Dimensions



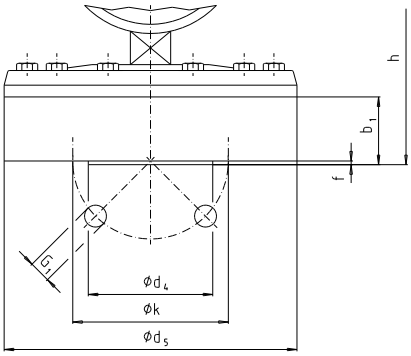

| Size (mm) | Ranges [ bar ] | Dimension [ mm ] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ∅ d | a | B ± 1 with 1+2 cont. | B ± 1 with 3 cont. | $D_1$ | $D_2$ | G | h ± 2 | SW |
| 100 | ≤ 0,25 | 160 | 15,5 | 88 | 96 | 101 | 99 | G 1/2B | 117 | 22 |
| 160 | | | | | | 161 | 159 | | 149 | 22 |
| 100 | > 0,25 | 100 | 15,5 | 88 | 96 | 101 | 99 | G 1/2B | 117 | 22 |
| 160 | | | | | | 161 | 159 | | 149 | 22 |

| Size (mm) | Ranges [ bar ] | contact | weight [ kg ] approx | |
|---|---|---|---|---|
| | | | unfilled with | filled with |
| 100 | ≤ 0,25 | 1+2 - contact | 3,7 | 4,2 |
| | | 3 - contact | 3,7 | 4,2 |
| 160 | ≤ 0,25 | 1+2 - contact | 4,6 | 5,8 |
| | | 3 - contact | 4,7 | 6,0 |
| 100 | > 0,25 | 1+2 - contact | 2,2 | 2,7 |
| | | 3 - contact | 2,2 | 2,7 |
| 160 | > 0,25 | 1+2 - contact | 3,1 | 4,3 |
| | | 3 - contact | 3,1 | 4,4 |

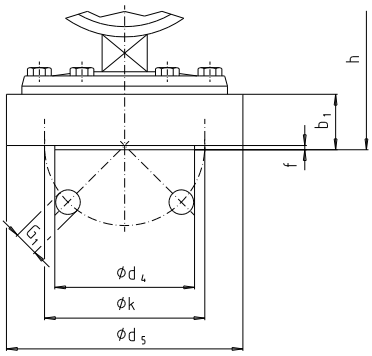
Thread to EN 837 -3

## Dimensions

**Optional DIN-flange connection DN 25 , PN 10 to PN 40**




Ranges 0 ... 25 to 0 ... 250 mbar

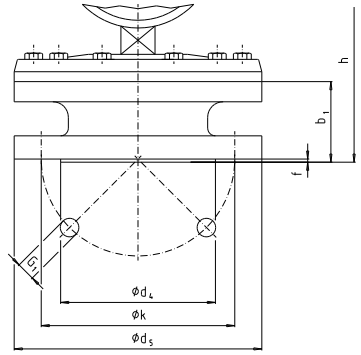



Ranges 0 ... 0.4 to 0 ... 40 bar

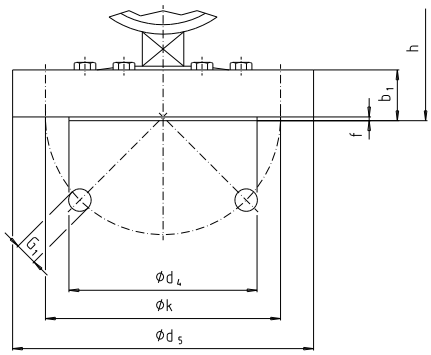
| Size (mm) | flange DIN DN 25 PN 10 bis 40 1) | Dimension [ mm ] | | | | | | | Weight 2) [ kg ] approx |
|---|---|---|---|---|---|---|---|---|---|
| | | $d_5$ | k | $d_4$ | $b_1$ | f | $G_1$ | h ± 2 | |
| 100 | ≤ 0,25 bar | 160 | 85 | 68 | 36 | 2 | 4 x M 12 | 122 | 3,0 |
| 160 | | | | | | | | 152 | 3,0 |
| 100 | > 0,25 bar | 115 | 85 | 68 | 25 | 2 | 4 x M 12 | 111 | 0,9 |
| 160 | | | | | | | | 141 | 0,9 |

Other dimensions as standard version

**Optional DIN-flange connection DN 50, PN 10 to PN 40**




Ranges 0 ... 25 to 0 ... 250 mbar




Ranges 0 ... 0.4 to 0 ... 40 bar

| Size (mm) | flange DIN DN 50 PN 10 bis 40 1) | Dimension [ mm ] | | | | | | | Weight 2) [ kg ] approx |
|---|---|---|---|---|---|---|---|---|---|
| | | $d_5$ | k | $d_4$ | $b_1$ | f | $G_1$ | h ± 2 | |
| 100 | ≤ 0,25 bar | 165 | 125 | 102 | 54 | 3 | 4 x ∅ 18 | 140 | 2,6 |
| 160 | | | | | | | | 170 | 2,6 |
| 100 | > 0,25 bar | 165 | 125 | 102 | 30 | 3 | 4 x ∅ 18 | 106 | 2,5 |
| 160 | | | | | | | | 136 | 2,5 |

Other dimensions as standard version

1) Suitable for mounting to flange acc. to DIN, sealing face form D to DIN 2526.
2) The listed weights are additional mass, which must be added to the weight of the standard version (connection G 1/2 B acc. to DIN 16 288).

Modifications reserved