

# Diaphragm pressure gauge, flush For sanitary applications Model PG43SA-S, NS 100

WIKA data sheet PM 04.16



for further approvals  
see page 10

## Applications

- Hygienic pressure measurement in sanitary applications for the pharmaceutical, biotechnology, food and beverage industries
- Mechanical pressure display on pipelines, fermenters, bioreactors and vessels
- Pressure/vacuum monitoring during cleaning, sterilisation, pressure testing
- For gases, compressed air, vapour; liquid, pasty, powdery and crystallising media

## Special features

- Safety via mechanical pressure transmission
- Case and wetted parts in hygienic design
- Suitable for SIP and CIP, optionally completely autoclavable
- Simple zero adjustment
- High overpressure safety

## Description

The model PG43SA diaphragm pressure gauge has been specifically designed for the requirements of sanitary applications.

The purely mechanical pressure transmission, using the diaphragm-element measuring principle, and the high overpressure safety ensure a safe pressure measurement. As a result of the dry measuring cell, the risk of contamination of the product by transmission fluid is eliminated. The flush welded diaphragm element in conjunction with the aseptic process connections (e.g. clamp, threaded, VARIVENT®, BioControl®) enables a dead-space free connection to the process.

The instrument finds applications, for example, in systems for ultrapure steam generation or as an independent pressure display, without the need for an external power supply, on portable tanks.



**Diaphragm pressure gauge, flush, model PG43SA-S**

The PG43SA-S in hygienic design can be used for CIP (cleaning in place) and SIP (sterilisation in place) and in wash-down areas, and optionally it can be completely sterilised in an autoclave. The measuring instrument can thus be cleaned reliably and time-efficiently. At an easily accessible point on the top of the case, the zero point can be easily corrected.

Based on a third party verification, the model PG43SA-S corresponds to the 3-A Sanitary Standard.

A variety of 3.1 and 2.2 certificates are available for GMP-compliant documentation, such as a material certificate or the list of single measured values.

## Specifications

### Version

EN 837-3

### Nominal size in mm

100

### Accuracy class

1.6

| Scale ranges |                   |                   |           |
|--------------|-------------------|-------------------|-----------|
| bar          | 0 ... 1.6         | 0 ... 2.5         | 0 ... 4   |
|              | 0 ... 6           | 0 ... 10          | 0 ... 16  |
|              | -1 ... +0.6       | -1 ... +1.5       | -1 ... +3 |
|              | -1 ... 5          | -1 ... 9          | -1 ... 15 |
| psi          | 0 ... 30          | 0 ... 60          |           |
|              | 0 ... 100         | 0 ... 160         |           |
|              | 0 ... 200         | -                 |           |
|              | -30 inHg ... +30  | -30 inHg ... +60  |           |
|              | -30 inHg ... +100 | -30 inHg ... +150 |           |

Option: Dual scale

The given scale ranges are also available in kPa and MPa.

### Pressure limitation

Steady: Full scale value

Fluctuating:

Scale range <4 bar: Full scale value

Scale range ≥4 bar: 2/3 x full scale value

Option: Vacuum safety

### Overpressure safety

2x full scale value, max. 40 bar or max. pressure rating (PN) of the process connection

Option: 5x full scale value, max. 40 bar or max. pressure rating (PN) of the process connection

### Permissible temperature

Ambient: -20 ... +60 °C

Medium: -20 ... +150 °C

CIP and SIP: 150 °C continuously for wetted parts

Option: Autoclavable, 134 °C, ≤ 20 minutes

### Temperature effect

When the temperature of the measuring system deviates from the reference temperature (+20 °C): max. ±0.5 % / 10 K of full scale value

### Ingress protection

IP54 per EN/IEC 60529

### Process connection

Stainless steel 1.4435 (316L), UNS S31603, lower mount

- Clamp connection per DIN 32676 / ISO 2852
- Aseptic connection per DIN 11864-1 /-2 /-3
- Milk thread fitting per DIN 11851
- VARIVENT®
- NEUMO BioControl®
- SMS threaded connection
- others on request

For exact designs and nominal widths see tables from page 4

### Pressure element

Diaphragm element, welded to the process connection, NiCr alloy 2.4668 (Inconel® 718), UNS N07718

### Surface roughness of wetted parts

- $R_a \leq 0.76 \mu\text{m}$  (30  $\mu\text{in}$ ) per ASME BPE SF3
- Option:  $R_a \leq 0.38 \mu\text{m}$  (15  $\mu\text{in}$ ), weld seam:  $R_a \leq 0.76 \mu\text{m}$  (30  $\mu\text{in}$ )
- Option: Electropolished,  $R_a \leq 0.38 \mu\text{m}$  (15  $\mu\text{in}$ ), weld seam:  $R_a \leq 0.76 \mu\text{m}$  (30  $\mu\text{in}$ ) per ASME BPE SF4

### Level of cleanliness of wetted parts

ASTM G93 level C / ISO 15001 (residual content of non-volatile hydrocarbons ≤ 66 mg/m<sup>2</sup>)

### Movement

Stainless steel

### Dial

Aluminium, white, black lettering

### Pointer

Aluminium, black

### Case

Stainless steel 1.4301 (304), electropolished

Surface roughness:  $R_a \leq 0.76 \mu\text{m}$  (20  $\mu\text{in}$ ), (except for weld seam)

### Window

Polycarbonate (polysulfone for autoclavable versions)

### Ring

Crimp ring, stainless steel 1.4301 (304)

VARIVENT® is a registered trademark of the company GEA Tuchenhausen.  
BioControl® is a registered trademark of the company NEUMO.

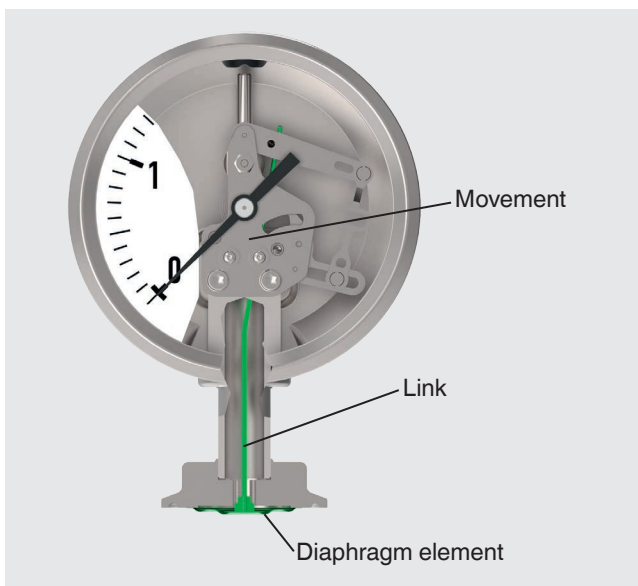
### Zero adjustment

External zero adjustment, setting range  $\pm 15^\circ$



The zero adjustment can be made with a slotted screwdriver after the removal of the sealing plug on the top of the case.

### Measuring principle



The diaphragm element is welded flush to the aseptic process connection. On pressurisation, the deflection of the pressure element, proportional to the incident pressure, is transferred mechanically to a movement via a link. The risk of contamination by transmission fluid is therefore eliminated.

## Dimensions in mm

### Type of process connection: Clamp connection per DIN 32676

Pipe standard: Pipes per DIN 11866 row C or ASME BPE

| DN   | For pipe<br>Outer Ø x wall<br>thickness | PN <sup>1)</sup> | Dimensions in mm |    |       |      |    |
|------|-----------------------------------------|------------------|------------------|----|-------|------|----|
|      |                                         |                  | NS               | h  | Ø Plf | d    | k  |
| 1 ½" | 38.1 x 1.65                             | 40               | 100              | 91 | 35    | 50.5 | 15 |
| 2"   | 50.8 x 1.65                             | 40               | 100              | 91 | 35    | 64   | 15 |

### Type of process connection: Clamp connection per DIN 32676

Pipe standard: Pipes per DIN 11866 row B or ISO 1127 row 1

| DN   | For pipe<br>Outer Ø x wall<br>thickness | PN <sup>1)</sup> | Dimensions in mm |    |       |    |    |
|------|-----------------------------------------|------------------|------------------|----|-------|----|----|
|      |                                         |                  | NS               | h  | Ø Plf | d  | k  |
| 42.4 | 42.4 x 2                                | 40               | 100              | 91 | 35    | 64 | 15 |
| 48.3 | 48.3 x 2                                | 40               | 100              | 91 | 35    | 64 | 15 |

### Type of process connection: Clamp connection per BS4825 Part 3

Pipe standard: Pipes per BS4825 part 1 and O.D. tube

| DN   | For pipe<br>Outer Ø x wall<br>thickness | PN <sup>1)</sup> | Dimensions in mm |    |       |      |    |
|------|-----------------------------------------|------------------|------------------|----|-------|------|----|
|      |                                         |                  | NS               | h  | Ø Plf | d    | k  |
| 1 ½" | 38.1 x 1.6                              | 40               | 100              | 91 | 35    | 50.5 | 15 |
| 2"   | 50.8 x 1.6                              | 40               | 100              | 91 | 35    | 64   | 15 |

### Type of process connection: Clamp connection per DIN 32676

Pipe standard: Pipes per DIN 11866 row A or DIN 11850 row 2

| DN | For pipe<br>Outer Ø x wall<br>thickness | PN <sup>1)</sup> | Dimensions in mm |    |       |      |    |
|----|-----------------------------------------|------------------|------------------|----|-------|------|----|
|    |                                         |                  | NS               | h  | Ø Plf | d    | k  |
| 40 | 41 x 1.5                                | 40               | 100              | 91 | 35    | 50.5 | 15 |
| 50 | 53 x 1.5                                | 40               | 100              | 91 | 35    | 64   | 15 |

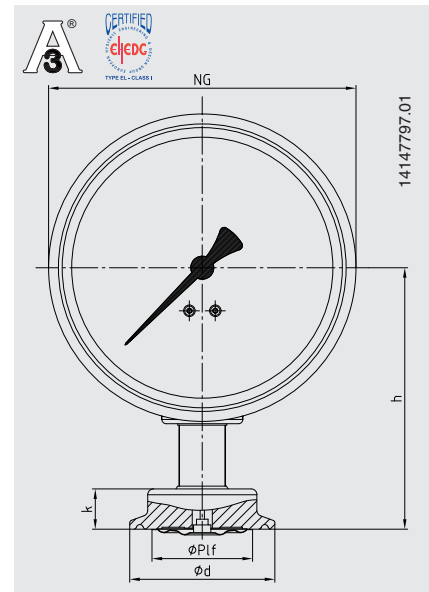
### Type of process connection: Clamp connection per ISO 2852

Pipe standard: Pipes per ISO 2037 and BS 4825 part 1

| DN | For pipe<br>Outer Ø x wall<br>thickness | PN <sup>1)</sup> | Dimensions in mm |    |       |      |    |
|----|-----------------------------------------|------------------|------------------|----|-------|------|----|
|    |                                         |                  | NS               | h  | Ø Plf | d    | k  |
| 38 | 38 x 1.2                                | 25               | 100              | 91 | 35    | 50.5 | 15 |
| 40 | 40 x 1.2                                | 25               | 100              | 91 | 35    | 64   | 15 |
| 51 | 51 x 1.2                                | 25               | 100              | 91 | 35    | 64   | 15 |

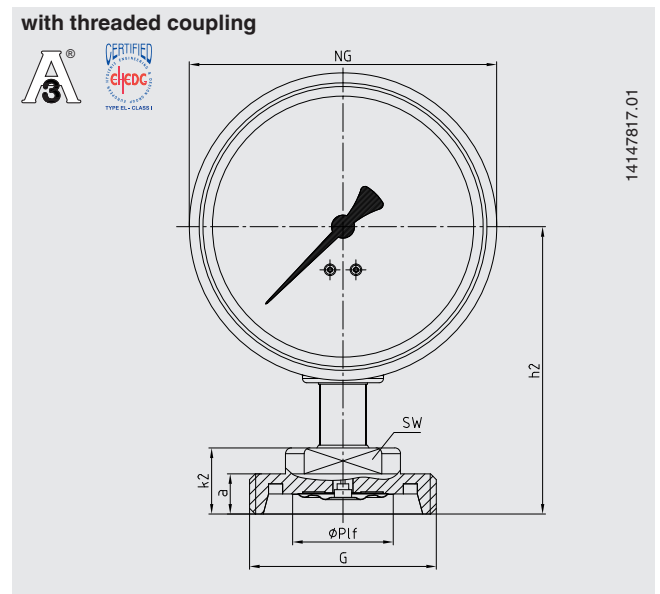
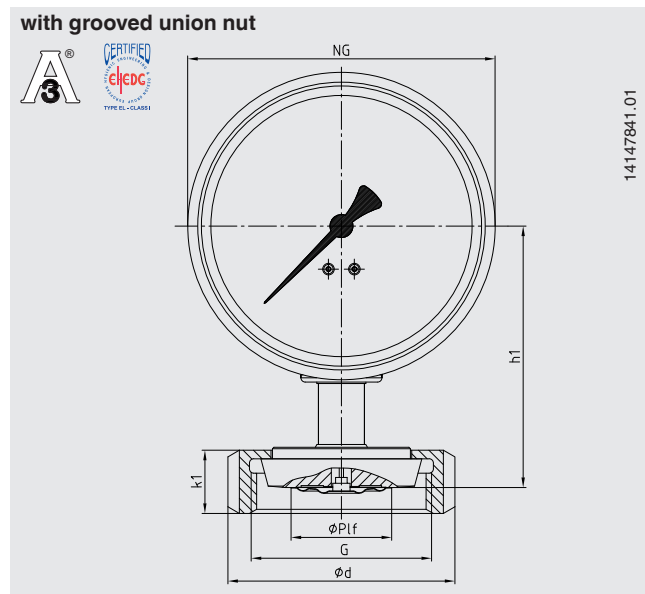
<sup>1)</sup> For maximum pressure range consider pressure rating of clamp.

EHEDG conformity only in combination with Tri-Clamp seals from Combifit International B.V.



## Type of process connection: Threaded connection per DIN 11851

Pipe standard: Pipes per DIN 11850 row 2

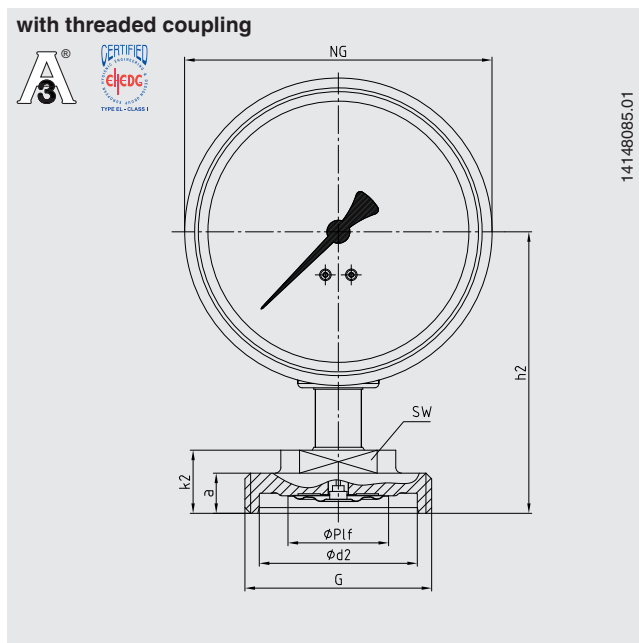
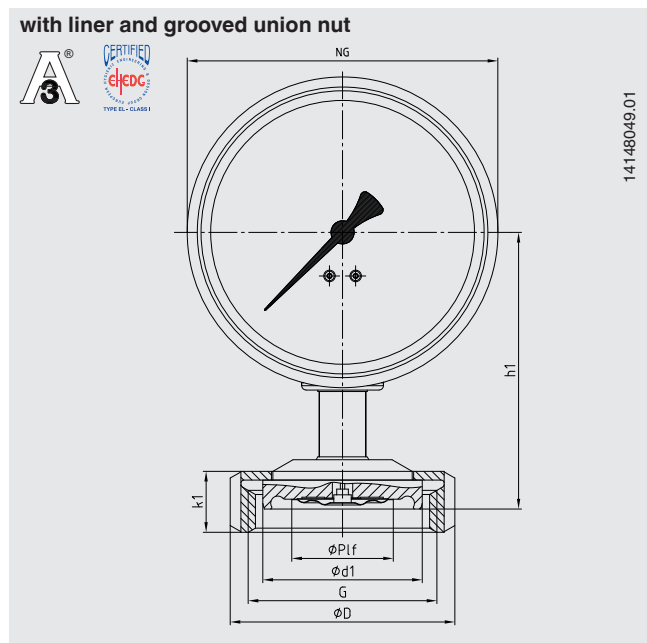


| DN | For pipe<br>Outer Ø x wall<br>thickness | PN | Dimensions in mm |    |     |       |             |    |    |    |    |    |
|----|-----------------------------------------|----|------------------|----|-----|-------|-------------|----|----|----|----|----|
|    |                                         |    | NS               | h1 | h2  | Ø Plf | G           | d  | k1 | k2 | a  | SW |
| 40 | 41 x 1.5                                | 40 | 100              | 91 | 100 | 35    | Rd 65 x 1/6 | 78 | 22 | 23 | 14 | 27 |
| 50 | 53 x 1.5                                | 25 | 100              | 91 | 100 | 35    | Rd 78 x 1/6 | 92 | 22 | 23 | 14 | 27 |

For a 3-A conform connection of process connections with milk thread fittings per DIN 11851, profile sealings from SKS Komponenten BV or Kieselmann GmbH have to be used.

EHEDG conformity only in combination with ASEPTO-STAR k-flex upgrade, sealing from Kieselmann GmbH.

## Aseptic threaded pipe connection per DIN 11864-1 form A



### Type of process connection: Aseptic threaded pipe connection per DIN 11864-1 form A

Pipe standard: Pipes per DIN 11866 row A or DIN 11850 row 2

| DN | For pipe<br>Outer Ø x<br>wall thick-<br>ness | PN<br><sup>1)</sup> | Dimensions in mm |    |    |       |             |      |    |    |    |    |    |    |
|----|----------------------------------------------|---------------------|------------------|----|----|-------|-------------|------|----|----|----|----|----|----|
|    |                                              |                     | NS               | h1 | h2 | Ø Plf | G           | d1   | d2 | D  | k1 | k2 | a  | SW |
| 40 | 41 x 1.5                                     | 40                  | 100              | 95 | 98 | 35    | Rd 65 x 1/6 | 54.9 | 55 | 78 | 22 | 23 | 14 | 27 |
| 50 | 53 x 1.5                                     | 25                  | 100              | 95 | 96 | 35    | Rd 78 x 1/6 | 66.9 | 67 | 92 | 22 | 23 | 14 | 27 |

### Type of process connection: Aseptic threaded pipe connection per DIN 11864-1 form A

Pipe standard: Pipes per DIN 11866 row B or DIN ISO 1127 row 1

| DN   | For pipe<br>Outer Ø x<br>wall thick-<br>ness | PN<br><sup>1)</sup> | Dimensions in mm |    |    |       |             |      |    |    |    |    |    |    |
|------|----------------------------------------------|---------------------|------------------|----|----|-------|-------------|------|----|----|----|----|----|----|
|      |                                              |                     | NS               | h1 | h2 | Ø Plf | G           | d1   | d2 | D  | k1 | k2 | a  | SW |
| 42.4 | 42.4 x 2.0                                   | 25                  | 100              | 95 | 98 | 35    | Rd 65 x 1/6 | 54.9 | 55 | 78 | 22 | 23 | 14 | 27 |
| 48.3 | 48.3 x 2.0                                   | 25                  | 100              | 95 | 96 | 35    | Rd 78 x 1/6 | 66.9 | 67 | 92 | 22 | 23 | 14 | 27 |

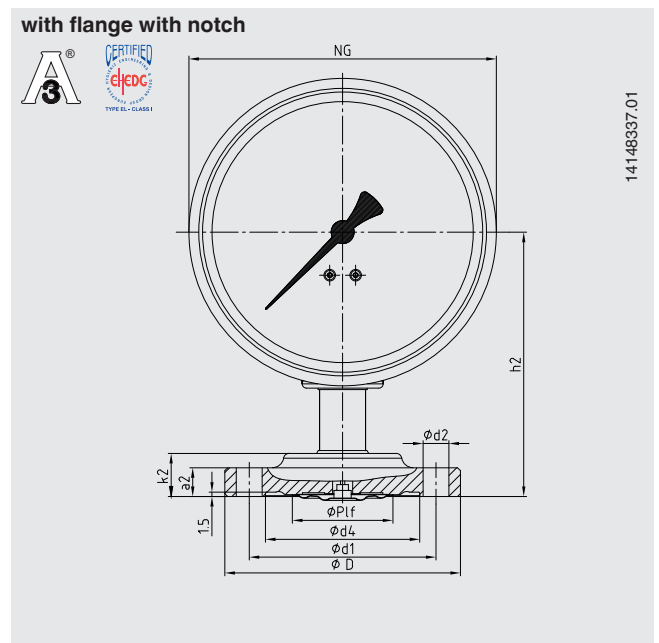
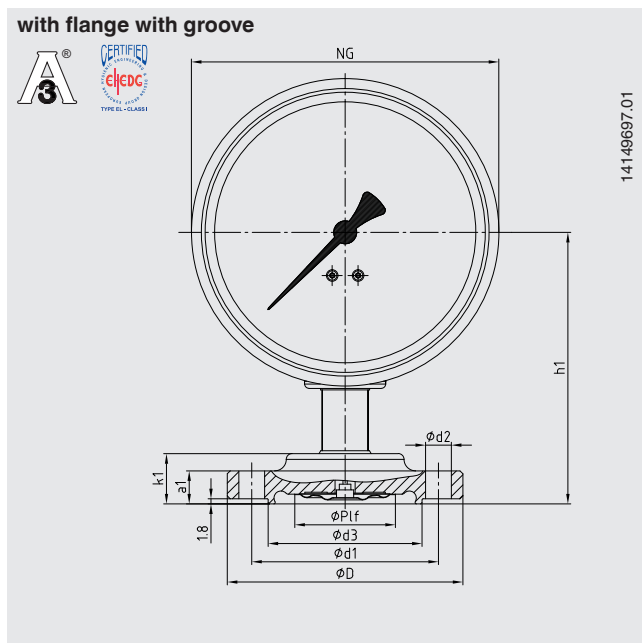
### Type of process connection: Aseptic threaded pipe connection per DIN 11864-1 form A

Pipe standard: Pipes per DIN 11866 row C or ASME BPE

| DN     | For pipe<br>Outer Ø x<br>wall thick-<br>ness | PN<br><sup>1)</sup> | Dimensions in mm |    |    |       |             |      |    |    |    |    |    |    |
|--------|----------------------------------------------|---------------------|------------------|----|----|-------|-------------|------|----|----|----|----|----|----|
|        |                                              |                     | NS               | h1 | h2 | Ø Plf | G           | d1   | d2 | D  | k1 | k2 | a  | SW |
| 1 1/2" | 38.1 x 1.65                                  | 40                  | 100              | 95 | 98 | 35    | Rd 58 x 1/6 | 54.9 | 55 | 78 | 22 | 23 | 14 | 27 |
| 2"     | 50.8 x 1.65                                  | 25                  | 100              | 95 | 96 | 35    | Rd 65 x 1/6 | 66.9 | 67 | 92 | 22 | 23 | 14 | 27 |

<sup>1)</sup> Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature from -10 to +140 °C.

## Aseptic flange connection per DIN 11864-2 form A



### Type of process connection: Aseptic flange connection per DIN 11864-2 form A

Pipe standard: Pipes per DIN 11866 row A or DIN 11850 row 2

| DN | For pipe<br>Outer Ø x wall<br>thickness | PN<br><sup>1)</sup> | Dimensions in mm |    |    |       |    |         |      |      |    |      |    |      |    |
|----|-----------------------------------------|---------------------|------------------|----|----|-------|----|---------|------|------|----|------|----|------|----|
|    |                                         |                     | NS               | h1 | h2 | Ø Plf | d1 | d2      | d3   | d4   | D  | k1   | k2 | a1   | a2 |
| 40 | 41 x 1.5                                | 25                  | 100              | 94 | 92 | 35    | 65 | 4 x Ø 9 | 53.6 | 53.7 | 82 | 17.5 | 15 | 11.5 | 10 |
| 50 | 53 x 1.5                                | 16                  | 100              | 94 | 92 | 35    | 77 | 4 x Ø 9 | 65.6 | 65.7 | 94 | 17.5 | 15 | 11.5 | 10 |

### Type of process connection: Aseptic flange connection per DIN 11864-2 form A

Pipe standard: Pipes per DIN 11866 row B or DIN ISO 1127 row 1

| DN   | For pipe<br>Outer Ø x wall<br>thickness | PN<br><sup>1)</sup> | Dimensions in mm |    |    |       |    |         |      |      |    |      |    |      |    |
|------|-----------------------------------------|---------------------|------------------|----|----|-------|----|---------|------|------|----|------|----|------|----|
|      |                                         |                     | NS               | h1 | h2 | Ø Plf | d1 | d2      | d3   | d4   | D  | k1   | k2 | a1   | a2 |
| 42.4 | 42.4 x 2.0                              | 16                  | 100              | 94 | 92 | 35    | 65 | 4 x Ø 9 | 54   | 54.1 | 82 | 17.5 | 15 | 11.5 | 10 |
| 48.3 | 48.3 x 2.0                              | 16                  | 100              | 94 | 92 | 35    | 77 | 4 x Ø 9 | 59.9 | 60   | 94 | 17.5 | 15 | 11.5 | 10 |

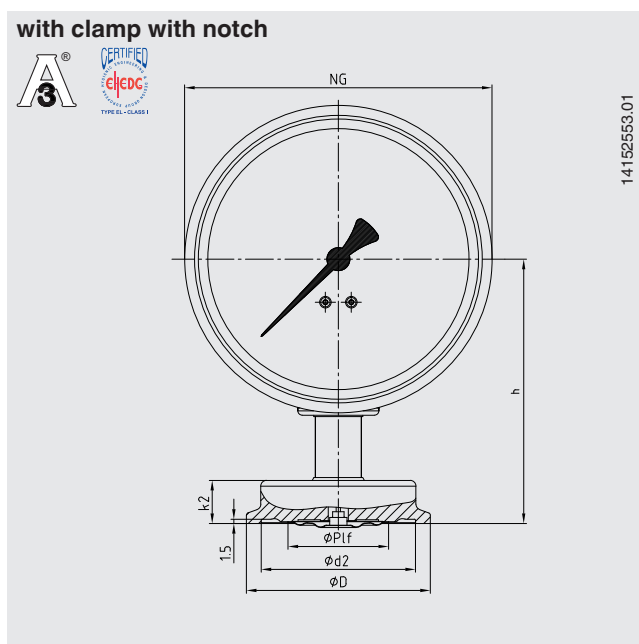
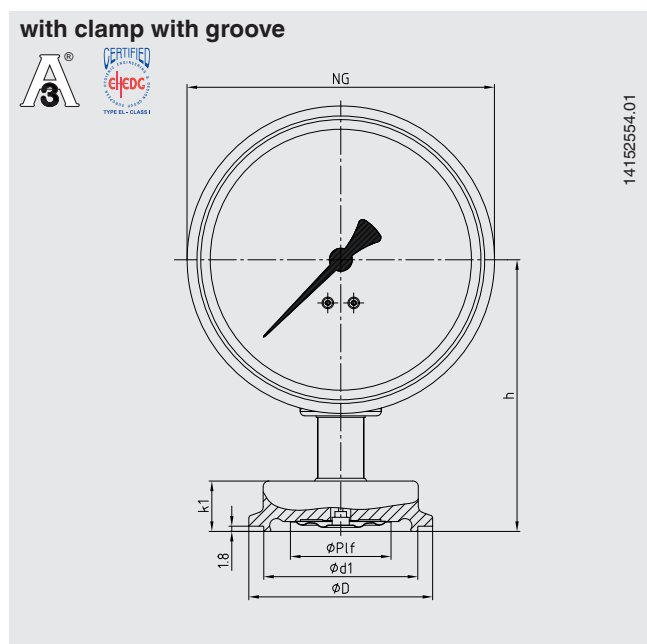
### Type of process connection: flange connection per DIN 11864-2 form A

Pipe standard: Pipes per DIN 11866 row C or ASME BPE

| DN   | For pipe<br>Outer Ø x wall<br>thickness | PN<br><sup>1)</sup> | Dimensions in mm |    |    |       |    |         |      |      |    |      |    |      |    |
|------|-----------------------------------------|---------------------|------------------|----|----|-------|----|---------|------|------|----|------|----|------|----|
|      |                                         |                     | NS               | h1 | h2 | Ø Plf | d1 | d2      | d3   | d4   | D  | k1   | k2 | a1   | a2 |
| 1 ½" | 38.1 x 1.65                             | 25                  | 100              | 94 | 92 | 35    | 65 | 4 x Ø 9 | 50.4 | 50.4 | 79 | 17.5 | 15 | 11.5 | 10 |
| 2"   | 50.8 x 1.65                             | 16                  | 100              | 94 | 92 | 35    | 65 | 4 x Ø 9 | 63.4 | 63.5 | 82 | 17.5 | 15 | 11.5 | 10 |

1) Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature from -10 to +140 °C.

## Aseptic clamp connection per DIN 11864-3 form A



### Type of process connection: Aseptic clamp connection per DIN 11864-3 form A

Pipe standard: Pipes per DIN 11866 row A or DIN 11850 row 2

| DN | For pipe<br>Outer Ø x wall<br>thickness | PN <sup>1)</sup> | Dimensions in mm |    |       |      |      |      |      |    |
|----|-----------------------------------------|------------------|------------------|----|-------|------|------|------|------|----|
|    |                                         |                  | NS               | h  | Ø Plf | d1   | d2   | D    | k1   | k2 |
| 40 | 41 x 1.5                                | 40               | 100              | 92 | 35    | 53.6 | 53.7 | 64   | 17.5 | 15 |
| 50 | 53 x 1.5                                | 25               | 100              | 92 | 35    | 65.6 | 65.7 | 77.5 | 17.5 | 15 |

### Type of process connection: Aseptic clamp connection per DIN 11864-3 form A

Pipe standard: Pipes per DIN 11866 row B or DIN ISO 1127 row 1

| DN   | For pipe<br>Outer Ø x wall<br>thickness | PN <sup>1)</sup> | Dimensions in mm |    |       |      |      |      |      |    |
|------|-----------------------------------------|------------------|------------------|----|-------|------|------|------|------|----|
|      |                                         |                  | NS               | h  | Ø Plf | d1   | d2   | D    | k1   | k2 |
| 42.4 | 42.4 x 2.0                              | 25               | 100              | 92 | 35    | 53.6 | 53.7 | 64   | 17.5 | 15 |
| 48.3 | 48.3 x 2.0                              | 25               | 100              | 92 | 35    | 65.6 | 65.7 | 77.5 | 17.5 | 15 |

### Type of process connection: Aseptic clamp connection per DIN 11864-3 form A

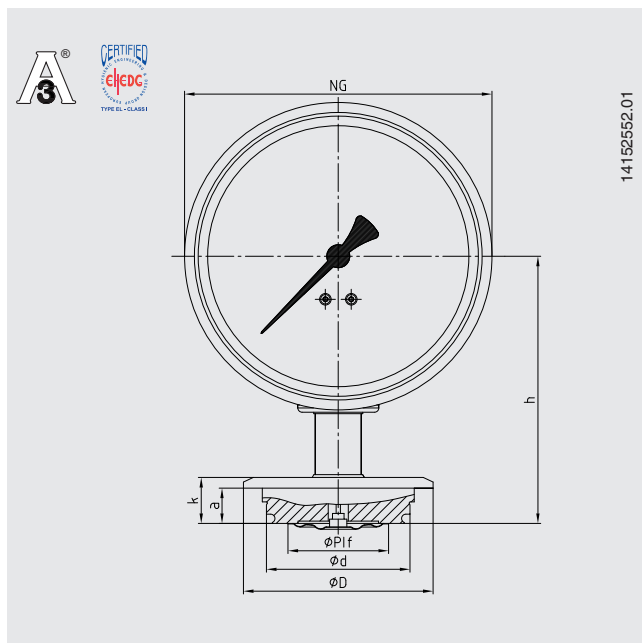
Pipe standard: Pipes per DIN 11866 row C or ASME BPE

| DN   | For pipe<br>Outer Ø x wall<br>thickness | PN <sup>1)</sup> | Dimensions in mm |    |       |      |      |      |    |    |
|------|-----------------------------------------|------------------|------------------|----|-------|------|------|------|----|----|
|      |                                         |                  | NS               | h  | Ø Plf | d1   | d2   | D    | k1 | k2 |
| 1 ½" | 38.1 x 1.65                             | 40               | 100              | 92 | 35    | 50.4 | 50.5 | 64   | 31 | 28 |
| 2"   | 50.8 x 1.65                             | 25               | 100              | 92 | 35    | 63.4 | 63.5 | 77.5 | 31 | 28 |

<sup>1)</sup> Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature from -10 ... +140 °C.



## Type of process connection: VARIVENT®



| Access unit connection | PN <sup>1)</sup> | Dimensions in mm |    |       |       |    |    |      |
|------------------------|------------------|------------------|----|-------|-------|----|----|------|
|                        |                  | NS               | h  | Ø Plf | d     | D  | k  | a    |
| Form F                 | 25               | 100              | 93 | 35    | 49.95 | 66 | 17 | 12.3 |
| Form N                 | 25               | 100              | 93 | 35    | 68    | 84 | 17 | 12.3 |

1) Consider pressure rating of VARINLINE® access unit

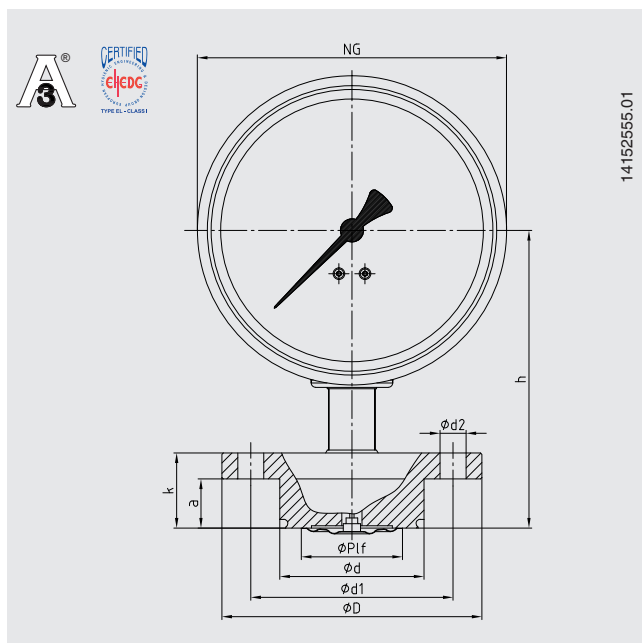
### Note:

Suitable for installation into the VARINLINE® access unit from GEA Tuchenhausen.

VARIVENT® and VARINLINE® are registered trademarks of the company GEA Tuchenhausen GmbH.

EHEDG conformity only in combination with EPDM O-ring from GEA Tuchenhausen GmbH.

## Type of process connection: NEUMO BioControl®



| BioControl® connection | PN <sup>2)</sup> | Dimensions in mm |     |       |      |    |         |     |    |    |
|------------------------|------------------|------------------|-----|-------|------|----|---------|-----|----|----|
|                        |                  | NS               | h   | Ø Plf | d    | d1 | d2      | D   | k  | a  |
| Size 50                | 16               | 100              | 103 | 35    | 49.9 | 70 | 4 x Ø 9 | 90  | 26 | 17 |
| Size 65                | 16               | 100              | 103 | 35    | 67.9 | 95 | 4 x Ø 9 | 120 | 26 | 17 |

2) Consider pressure rating of NEUMO BioControl® connection

## Approvals

| Logo                                                                             | Description                                                                                                                                              | Country                     |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
|  | <b>EAC (option)</b><br>Pressure equipment directive                                                                                                      | Eurasian Economic Community |
|  | <b>3-A</b><br>Sanitary Standard<br><br>This instrument is 3-A marked, based on a third party verification for conformance to the 3-A standard number 74. | USA                         |
|  | <b>EHEDG</b><br>Hygienic Equipment Design                                                                                                                | European Community          |
| -                                                                                | <b>CRN</b><br>Safety (e.g. electr. safety, overpressure, ...)                                                                                            | Canada                      |

## Manufacturer's information and certifications

Manufacturer's declaration regarding regulation (EC) no. 1935/2004

### Certificates (option)

- 2.2 test report per EN 10204  
(e.g. state-of-the-art manufacturing, material proof, indication accuracy, free from substances of animal origin)
- 3.1 inspection certificate per EN 10204  
(e.g. material proof for wetted metallic parts, indication accuracy)
- Others on request

Approvals and certificates, see website

### Ordering information

Scale range / Type of process connection, pipe standard, dimension / Autoclavable version / Overpressure limit / Certificates / Approvals / Options

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