

Diaphragm pressure gauge, flush

For sanitary applications

Model PG43SA-S, NS 100

WIKA data sheet PM 04.16



for further approvals see
page 4

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, autoclavable version available
- Easy zero point setting
- High overload safety

Description

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

The purely mechanical pressure transmission, using the diaphragm-element measurement principle, and the high overload 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, VARINLINE®, BioControl®) enables a dead-space free connection to the process.

The measuring instrument finds applications, for example 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 it can optionally 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

Design

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 | |

The given scale ranges are also available in kPa and MPa. Other scales or customer-specific dials, e.g. with red mark, circular arcs or circular sectors, on request

Pressure limitation

Steady: Full scale value

Fluctuating:

Scale range <4 bar: Full scale value

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

Overload safety

- 2x full scale value, max. 40 bar or max. pressure rating (PN) of the process connection
- 5x full scale value, max. 40 bar or max. pressure rating (PN) of the process connection

Vacuum resistance

- Without
- Vacuum-resistant to -1 bar

Depending on the scale range, vacuum resistance is provided or available on request

Permissible temperature

Ambient: -20 ... +60 °C

Medium: -20 ... +150 °C

CIP and SIP: 150 °C continuously for wetted parts

Autoclavable version, max. 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 per IEC/EN 60529

IP54

For model PG43SA-S with vent valve:

- IP68 with closed vent valve
- IP54 with open vent valve

Process connection

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

- Clamp connection per DIN 32676/BS4825 part 3
- Aseptic connection per DIN 11864-1 /-2 /-3
- Milk thread fitting per DIN 11851
- VARINLINE®
- 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

- Ra ≤ 0.76 µm (30 µin) per ASME BPE SF3
- Ra ≤ 0.38 µm (15 µin), weld seam: Ra ≤ 0.76 µm (30 µin)
- Electropolished, Ra ≤ 0.38 µm (15 µin) per ASME BPE SF4, weld seam: Ra ≤ 0.76 µm (30 µin)

Level of cleanliness of wetted parts

ASTM G93 level C / ISO 15001 (residual content of non-volatile hydrocarbons ≤ 66 mg/m²)

Movement

Stainless steel

Dial

Aluminium, white, black lettering

Pointer

Aluminium, black

Case

Stainless steel 1.4301 (304), electropolished

Surface roughness: Ra ≤ 0.76 µm (30 µin), (except for weld seam)

Window

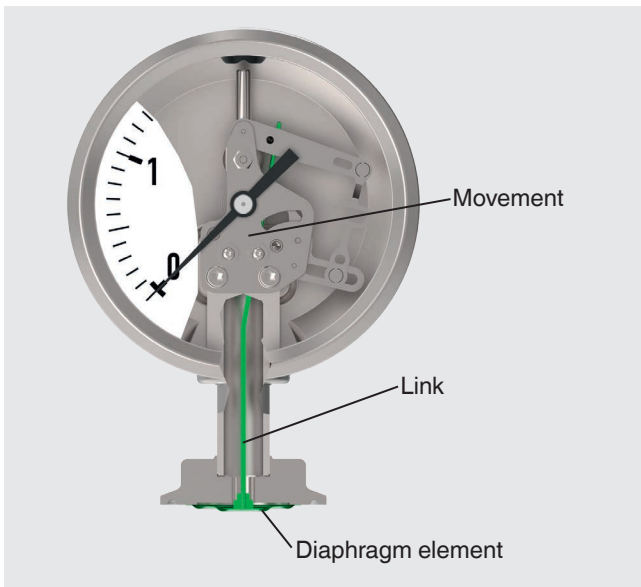
Polycarbonate (polysulfone with autoclavable version)

Ring

Crimp ring, stainless steel 1.4301 (304)

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

Functionality



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.

External zero point setting



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

Setting range $\pm 15^\circ \triangleq \pm 5.5\%$ of the span.

Further version

Model PG43SA-S with vent valve










The model PG43SA-S with vent valve has been specifically designed for cleaning from outside (“wash-down”) with particularly aggressive chemical cleaning agents in pharmaceutical cleaning systems (e.g. pharmaceutical cabinet washers).

With the vent valve closed, the instrument is well protected from external influences (e.g. cleaning agents) due to its IP68 ingress protection. During operation and autoclaving (autoclavable version required) the vent valve must be open. With the valve open, the instrument fulfils IP54 ingress protection.

This version is not available with external zero point setting. For dimensions see page 11.

Approvals

| Logo | Description | Country |
|--|---|--------------------|
|   | EU declaration of conformity ATEX directive (option) Hazardous areas - Ex h Zone 1 gas II 2G Ex h IIC T6 ... T1 Gb X Zone 21 dust II 2D Ex h IIC T85 °C ... T450 °C Db X | European Union |
|  | GOST (option) Metrology, measurement technology | Russia |
|  | KazInMetr (option) Metrology, measurement technology | Kazakhstan |
|  | Uzstandard (option) Metrology, measurement technology | Uzbekistan |
|  | 3-A Sanitary Standard This instrument is 3-A marked, based on a third party verification for conformance to the 3-A standard number 74. | USA |
|  | EHEDG Hygienic Equipment Design | European Community |
| - | CRN Safety (e.g. electr. safety, overpressure, ...) | Canada |

Manufacturer's information and certificates

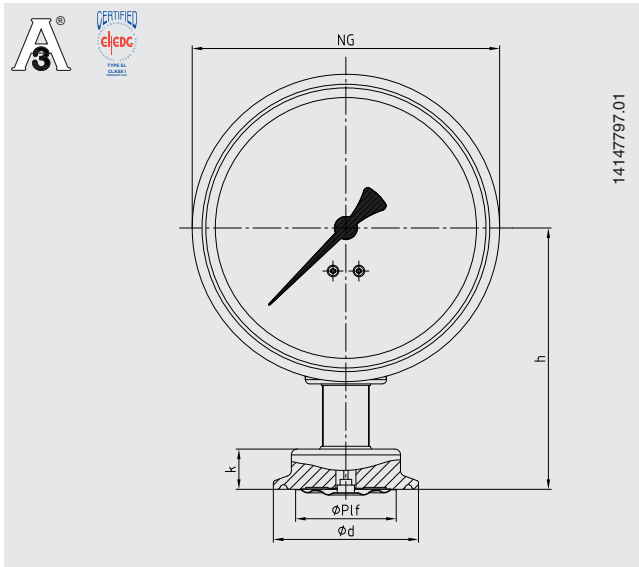
Manufacturer's declaration regarding regulation (EC)
no. 1935/2004

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 metal parts, indication accuracy)
- Others on request

Approvals and certificates, see website

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 Outer Ø x wall thickness | PN ¹⁾ | Dimensions in mm | | | | |
|------|---|------------------|------------------|----|-------|------|----|
| | | | NG | h | Ø P1f | 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 Outer Ø x wall thickness | PN ¹⁾ | Dimensions in mm | | | | |
|------|---|------------------|------------------|----|-------|----|----|
| | | | NG | h | Ø P1f | 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 DIN 32676

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

| DN | For pipe Outer Ø x wall thickness | PN ¹⁾ | Dimensions in mm | | | | |
|----|---|------------------|------------------|----|-------|------|----|
| | | | NG | h | Ø P1f | 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 BS4825 part 3

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

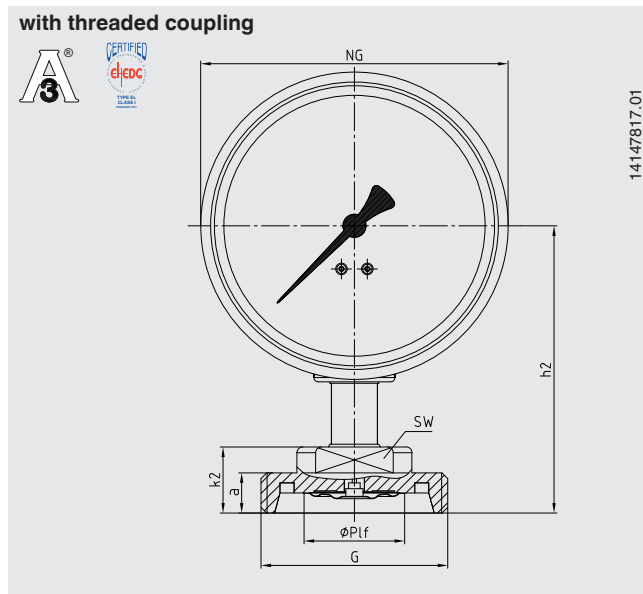
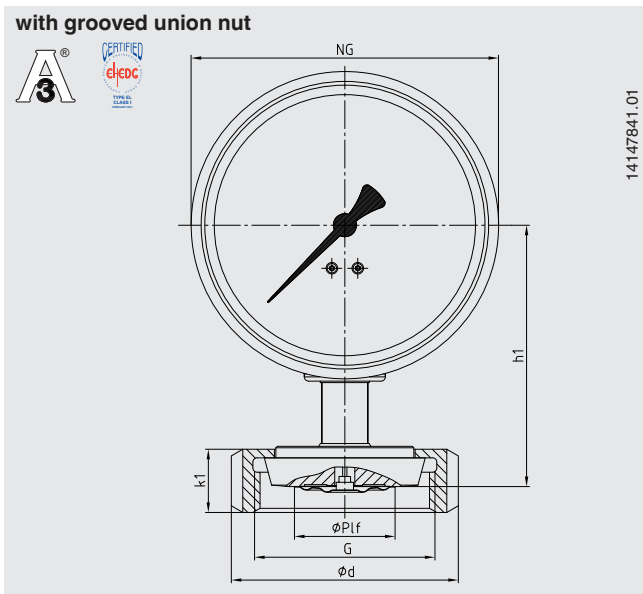
| DN | For pipe Outer Ø x wall thickness | PN ¹⁾ | Dimensions in mm | | | | |
|------|---|------------------|------------------|----|-------|------|----|
| | | | NG | h | Ø P1f | d | k |
| 1 ½" | 38.1 x 1.6 | 40 | 100 | 91 | 35 | 50.5 | 15 |
| 2" | 50.8 x 1.6 | 40 | 100 | 91 | 35 | 64 | 15 |

1) For maximum pressure range consider pressure rating of clamp.

EHEDG conformity only in combination with TRI-CLAMP® sealings from Combifit International B.V.
TRI-CLAMP® is a trademark of the company Alfa Laval AB SE

Type of process connection: Threaded connection per DIN 11851

Pipe standard: Pipes per DIN 11850 row 2

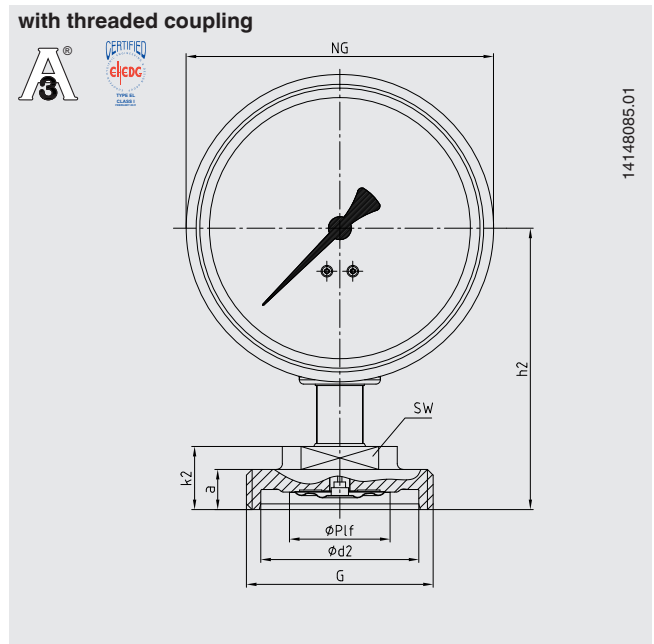
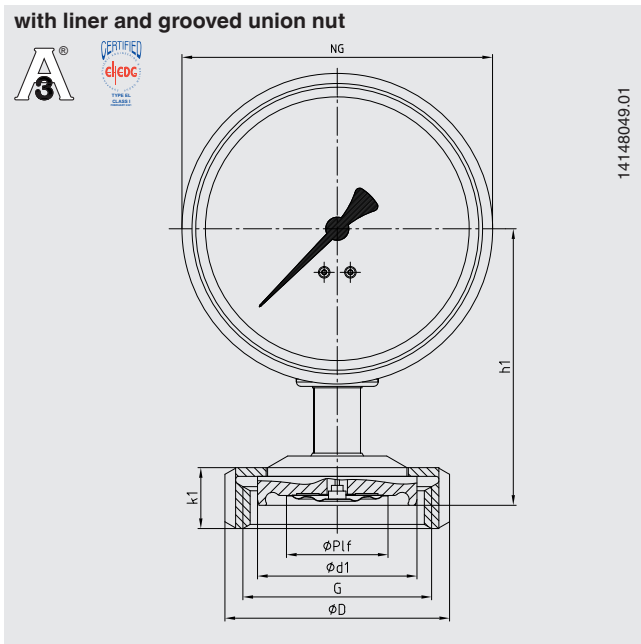


| DN | For pipe Outer ϕ x wall thickness | PN | Dimensions in mm | | | | | | | | | |
|----|--|----|------------------|----|-----|------------|-------------|----|----|----|----|----|
| | | | NG | h1 | h2 | $\phi P f$ | G | d | k1 | k2 | a | SW |
| 40 | 41 x 1.5 | 40 | 100 | 91 | 100 | 35 | Rd 65 x 1/6 | 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-compliant 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 Outer Ø x wall thickness | PN 1) | Dimensions in mm | | | | | | | | | | | |
|----|--|----------|------------------|----|----|-------|-------------|------|----|----|----|----|----|----|
| | | | NG | 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 Outer Ø x wall thickness | PN 1) | Dimensions in mm | | | | | | | | | | | |
|------|--|----------|------------------|----|----|-------|-------------|------|----|----|----|----|----|----|
| | | | NG | 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 |

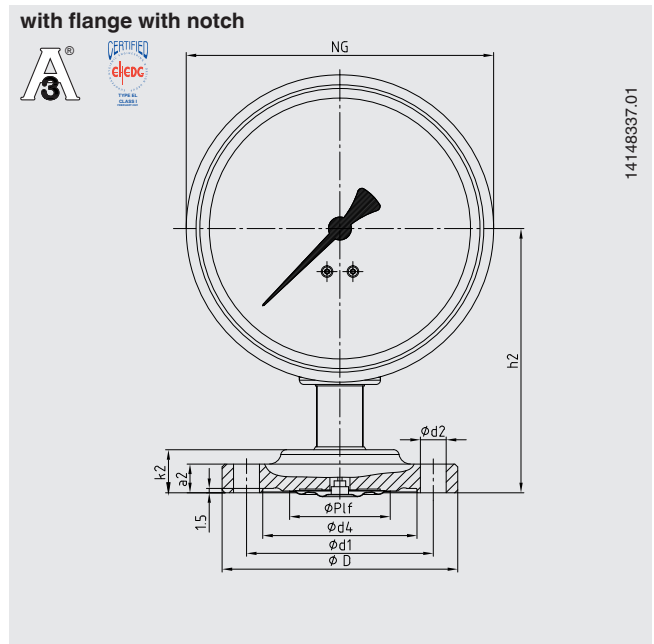
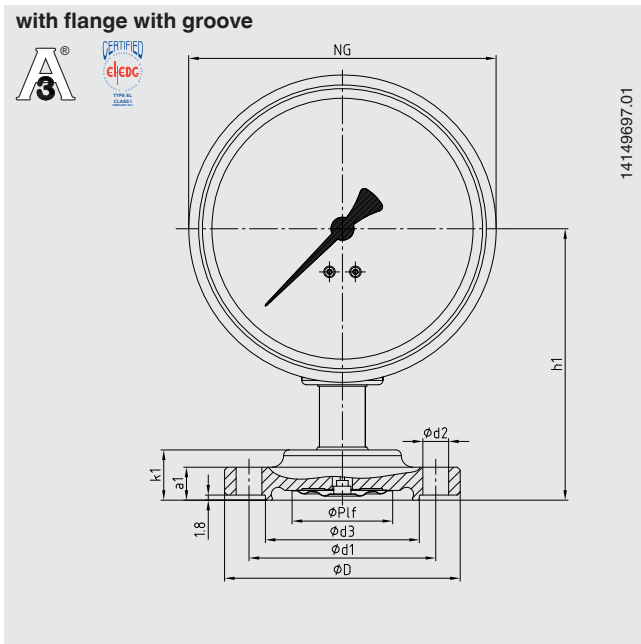
Type of process connection: Aseptic threaded pipe connection per DIN 11864-1 form A

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

| DN | For pipe Outer Ø x wall thickness | PN 1) | Dimensions in mm | | | | | | | | | | | |
|------|--|----------|------------------|----|----|-------|-------------|------|----|----|----|----|----|----|
| | | | NG | h1 | h2 | Ø Plf | G | d1 | d2 | D | k1 | k2 | a | SW |
| 1 ½" | 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 |

1) Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature of -10 ... +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 Outer Ø x wall thickness | PN 1) | Dimensions in mm | | | | | | | | | | | | |
|----|---|----------|------------------|----|----|------|----|---------|------|------|----|------|----|------|----|
| | | | NG | h1 | h2 | Ø Pf | 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 Outer Ø x wall thickness | PN 1) | Dimensions in mm | | | | | | | | | | | | |
|------|---|----------|------------------|----|----|------|----|---------|------|------|----|------|----|------|----|
| | | | NG | h1 | h2 | Ø Pf | 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 | 71 | 4 x Ø 9 | 59.9 | 60 | 88 | 17.5 | 15 | 11.5 | 10 |

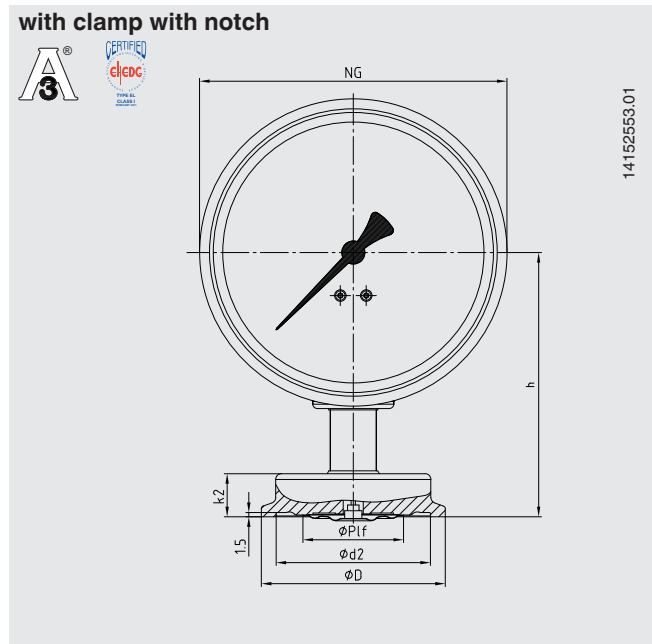
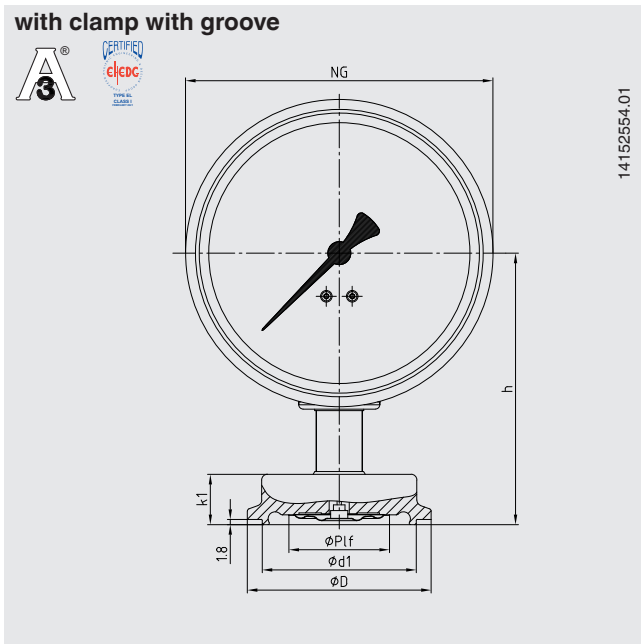
Type of process connection: Aseptic flange connection per DIN 11864-2 form A

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

| DN | For pipe Outer Ø x wall thickness | PN 1) | Dimensions in mm | | | | | | | | | | | | |
|--------|---|----------|------------------|----|----|------|----|---------|------|------|----|------|----|------|----|
| | | | NG | h1 | h2 | Ø Pf | d1 | d2 | d3 | d4 | D | k1 | k2 | a1 | a2 |
| 1 1/2" | 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 | 75 | 4 x Ø 9 | 63.4 | 63.5 | 92 | 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 of -10 ... +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 Outer ϕ x wall thickness | PN ¹⁾ | Dimensions in mm | | | | | | | |
|----|--|------------------|------------------|----|------------|------|------|------|------|----|
| | | | NG | h | ϕ P1f | 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 Outer ϕ x wall thickness | PN ¹⁾ | Dimensions in mm | | | | | | | |
|------|--|------------------|------------------|----|------------|------|------|----|------|----|
| | | | NG | h | ϕ P1f | 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 | 64 | 17.5 | 15 |

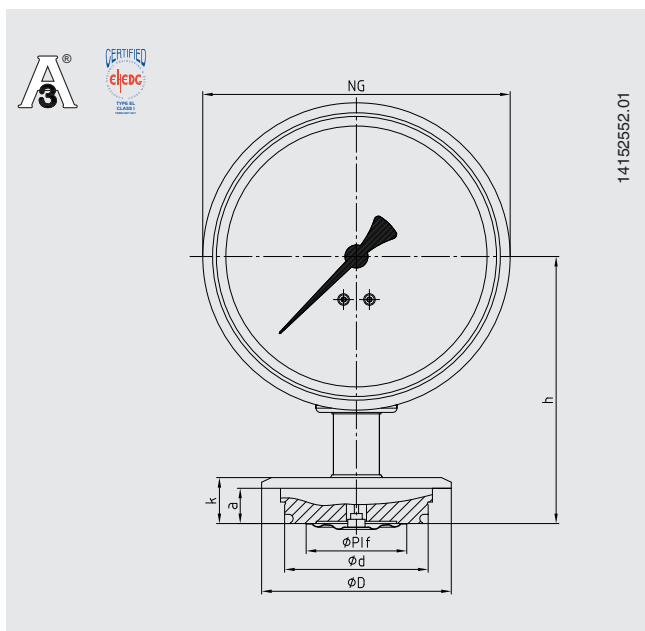
Type of process connection: Aseptic clamp connection per DIN 11864-3 form A

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

| DN | For pipe Outer ϕ x wall thickness | PN ¹⁾ | Dimensions in mm | | | | | | | |
|--------|--|------------------|------------------|----|------------|------|------|------|------|----|
| | | | NG | h | ϕ P1f | d1 | d2 | D | k1 | k2 |
| 1 1/2" | 38.1 x 1.65 | 40 | 100 | 92 | 35 | 50.4 | 50.5 | 64 | 17.5 | 15 |
| 2" | 50.8 x 1.65 | 25 | 100 | 92 | 35 | 63.4 | 63.5 | 77.5 | 17.5 | 15 |

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

Type of process connection: VARINLINE®



14152552.01

| Size | PN 1) | Dimensions in mm | | | | | | |
|--------|----------|------------------|----|-------|-------|----|----|------|
| | | NG | h | Ø P1f | 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 |

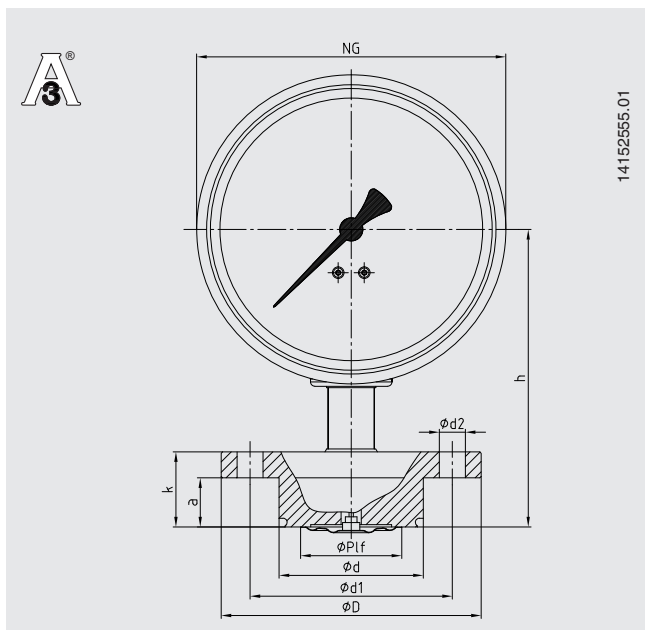
1) Consider pressure rating of VARINLINE® component

VARINLINE® is a registered trademark of the company GEA Tuchenhagen GmbH.

| Suitable VARINLINE® component | EHEDG-compliant | |
|---------------------------------|-----------------|--------|
| | Form F | Form N |
| Case | No | Yes |
| Type T case connecting flange | Yes | Yes |
| Type T-S case connecting flange | No | No |
| Type U case connecting flange | No | No |
| Type U-S case connecting flange | No | No |
| Type P tank connection flange | Yes | Yes |

EHEDG-compliant only in combination with an EPDM O-ring

Type of process connection: NEUMO BioControl®

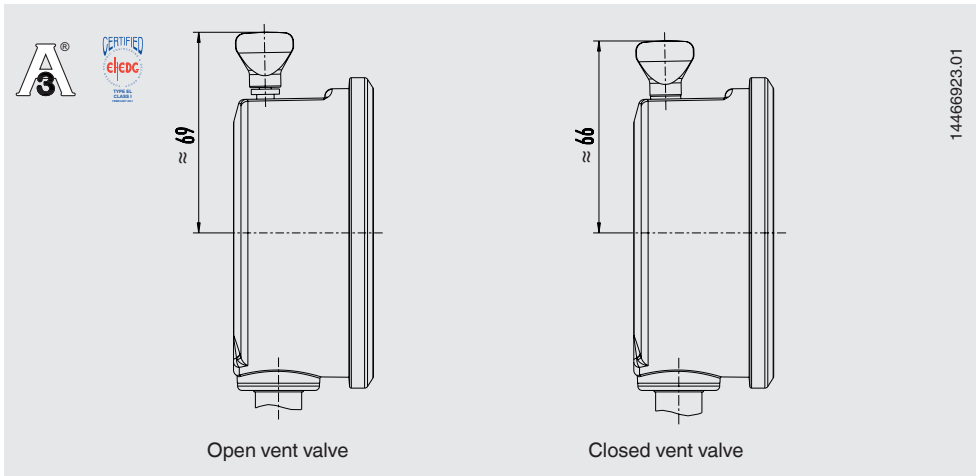


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| BioControl® connection | PN 2) | Dimensions in mm | | | | | | | | |
|------------------------|-------|------------------|-----|-------|------|----|---------|-----|----|----|
| | | NG | h | Ø P1f | d | d1 | d2 | D | k | a |
| Size 50 | 16 | 100 | 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

Model PG43SA-S with vent valve



Ordering information

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

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