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

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

Diaphragm pressure gauge, flush, model PG43SA-S

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.

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.

Data sheets showing similar products:
Diaphragm pressure gauge, flush; compact version, NS 63; model PG43SA-C; see data sheet PM 04.15

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

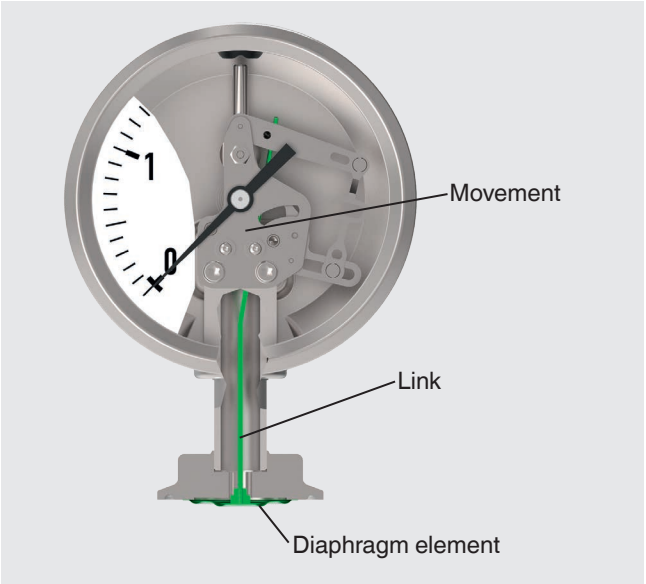
Pointer
Aluminium, black

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)

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 ±15° ≙ ±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
CE Ex	**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 IIIC 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

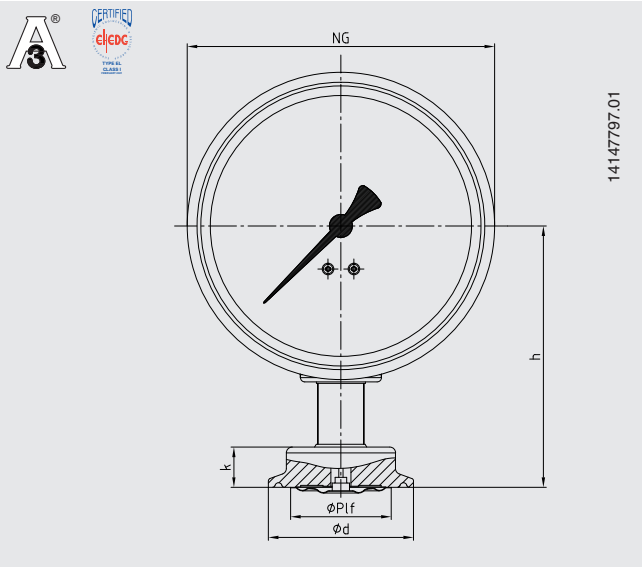
Manufacturer's declaration regarding regulation (EC) no. 1935/2004

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 PIf	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 PIf	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 PIf	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 PIf	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

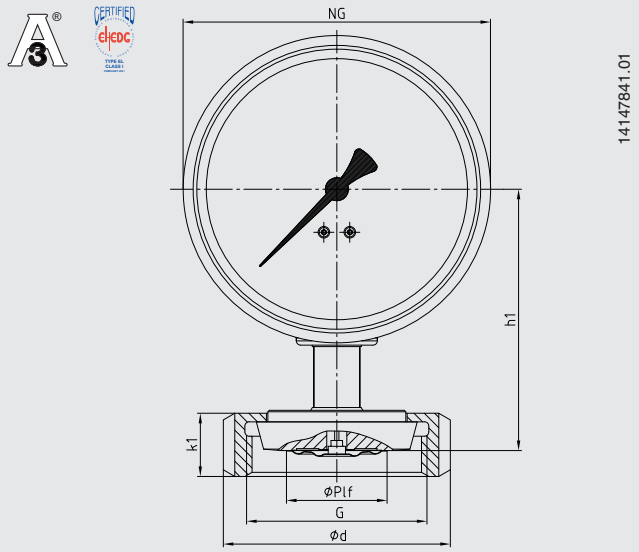
1) For maximum pressure range consider pressure rating of clamp.

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

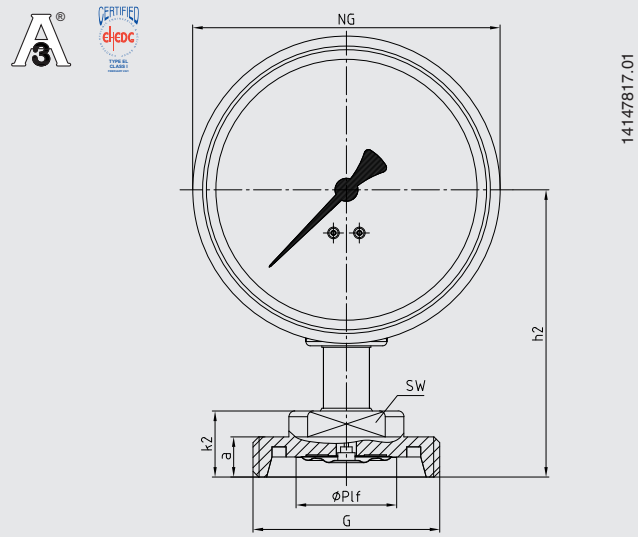
Type of process connection: Threaded connection per DIN 11851

Pipe standard: Pipes per DIN 11850 row 2

with grooved union nut



with threaded coupling



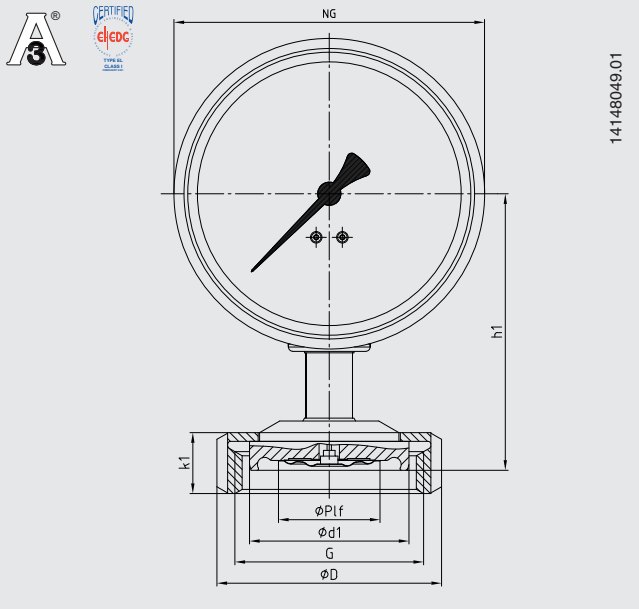
DN	For pipe Outer Ø x wall thickness	PN	Dimensions in mm									
			NG	h1	h2	Ø Plf	G	d	k1	k2	a	SW
40	41 x 1.5	40	100	91	100	35	Rd 65 x 1/6	78	22	23	14	27
50	53 x 1.5	25	100	91	100	35	Rd 78 x 1/6	92	22	23	14	27

For a 3-A-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.

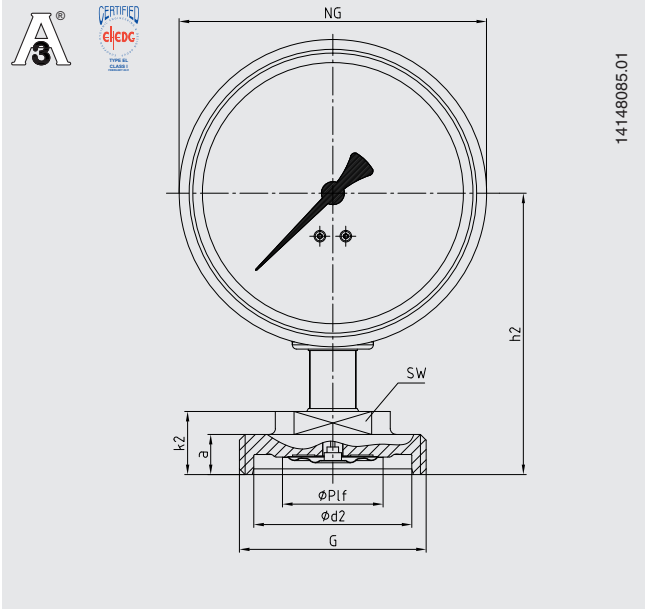
EHEDG conformity only in combination with ASEPTO-STAR k-flex upgrade, sealing from Kieselmann GmbH.

Aseptic threaded pipe connection per DIN 11864-1 form A

with liner and grooved union nut



with threaded coupling



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

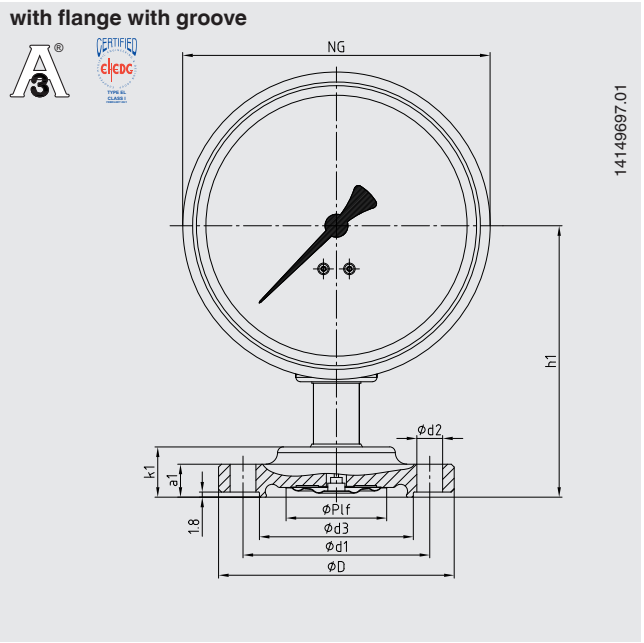
Type of process connection: Aseptic threaded pipe connection per DIN 11864-1 form A
Pipe standard: Pipes per DIN 11866 row C or ASME BPE

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

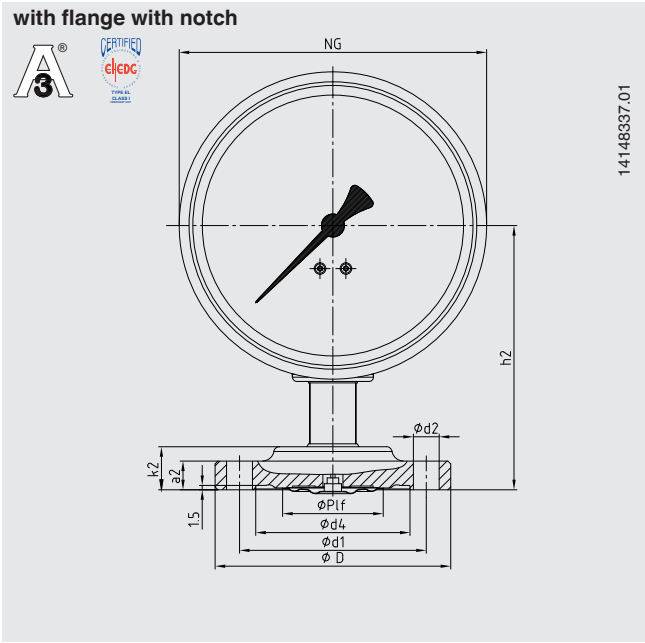
1) Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature of -10 ... +140 °C.

Aseptic flange connection per DIN 11864-2 form A

with flange with groove



with flange with notch



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 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 Outer Ø x wall thickness	PN 1)	Dimensions in mm												
			NG	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	71	4 x Ø 9	59.9	60	88	17.5	15	11.5	10

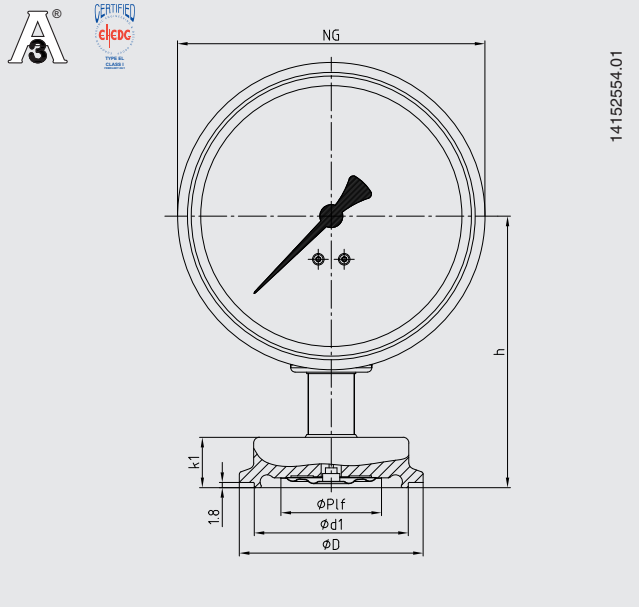
Type of process connection: Aseptic flange connection per DIN 11864-2 form A
Pipe standard: Pipes per DIN 11866 row C or ASME BPE

DN	For pipe Outer Ø x wall thickness	PN 1)	Dimensions in mm												
			NG	h1	h2	Ø 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	75	4 x Ø 9	63.4	63.5	92	17.5	15	11.5	10

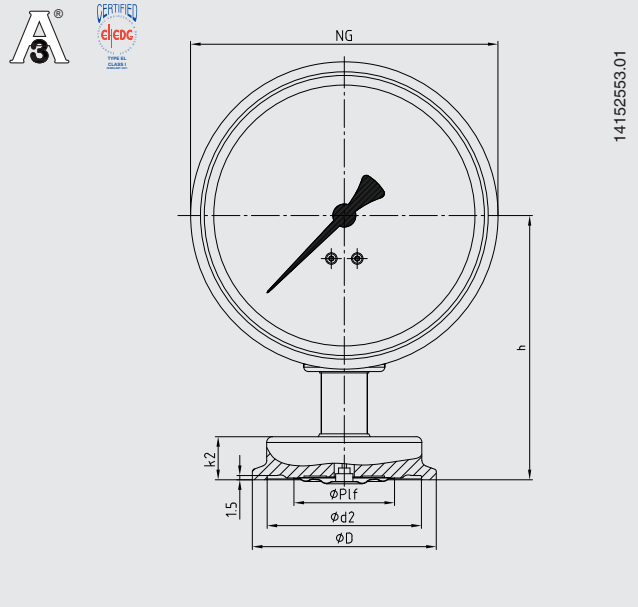
1) Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature of -10 ... +140 °C.

Aseptic clamp connection per DIN 11864-3 form A

with clamp with groove



with clamp with notch



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 Ø x wall thickness	PN [1]	Dimensions in mm							
			NG	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

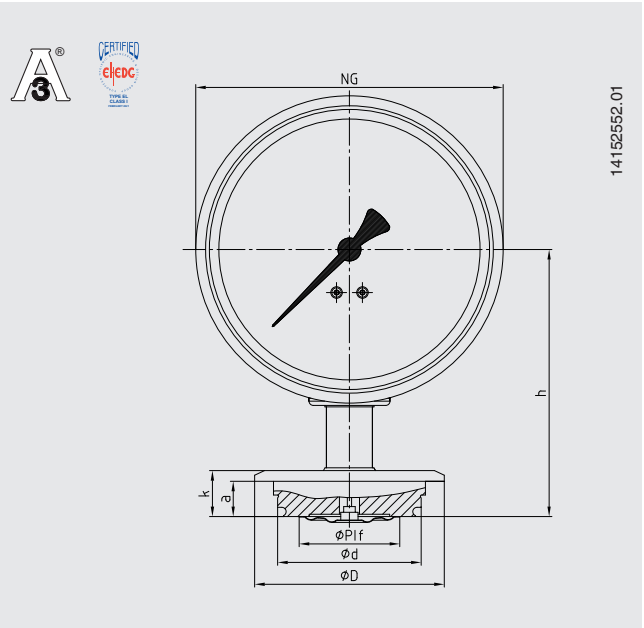
DN	For pipe Outer Ø x wall thickness	PN [1]	Dimensions in mm							
			NG	h	Ø Plf	d1	d2	D	k1	k2
42.4	42.4 x 2.0	25	100	92	35	53.6	53.7	64	17.5	15
48.3	48.3 x 2.0	25	100	92	35	65.6	65.7	64	17.5	15

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 Ø x wall thickness	PN [1]	Dimensions in mm							
			NG	h	Ø Plf	d1	d2	D	k1	k2
1 ½"	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®



Size	PN 1)	Dimensions in mm						
		NG	h	Ø PIf	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

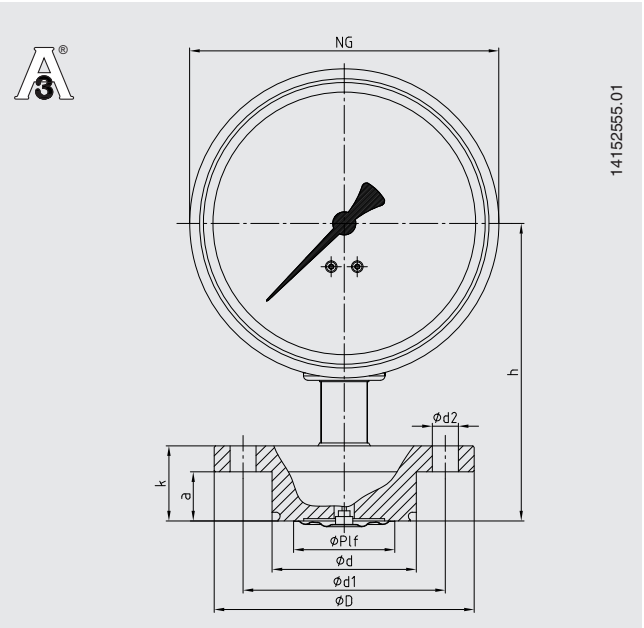
1) Consider pressure rating of VARINLINE® component

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

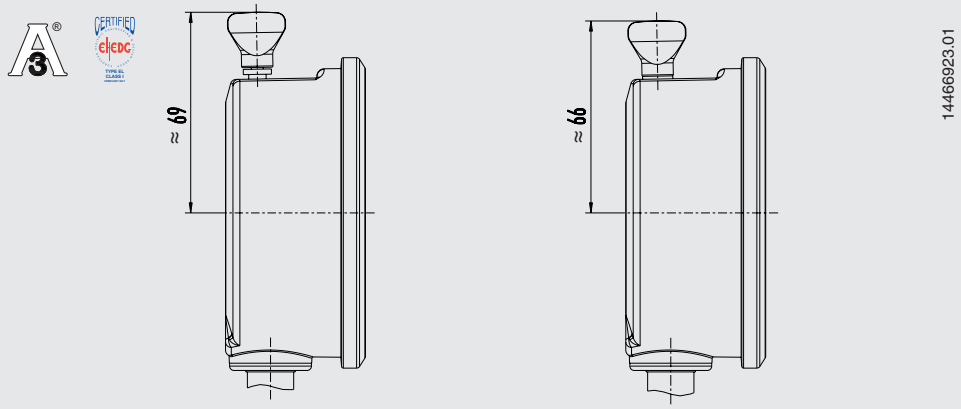
Type of process connection: NEUMO BioControl®



BioControl® connection	PN 2)	Dimensions in mm								
		NG	h	Ø PIf	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



Open vent valve

Closed vent valve

Ordering information

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

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