

In-line diaphragm seal with sterile connection

Aseptic connections

Model 981.51

WIKA data sheet DS 98.51



for further approvals
see page 4

Applications

- Ultra-pure steam systems
- Gases, compressed air, vapour; liquid, pasty, crystallising, flowing and pure media
- Pharmaceutical industry, biotechnology industry, production of active ingredients
- Aseptic plants or production of aseptic basic materials in the chemical industry

Special features

- Dead-space free, direct installation in pipes
- Easy to open, self-draining in all mounting positions
- Quick cleaning, without residue
- Suitable for COP, SIP and CIP
- Autoclavable version



In-line diaphragm seal, model 981.51

Description

Diaphragm seals are used for the protection of pressure measuring instruments in applications with difficult media. In diaphragm seal systems, the diaphragm of the diaphragm seal effects the separation of the instrument and the medium. The pressure is transmitted to the measuring instrument via the system fill fluid which is inside the diaphragm seal system.

For the implementation of demanding customer applications, there is a wide variety of designs, materials and system fill fluids available.

For further technical information on diaphragm seals and diaphragm seal systems see IN 00.06 "Application, operating principle, designs".

Due to their hygienic process connection, the model 981.51 diaphragm seals is ideally suited for food production, pharmaceutical and biotechnology applications. The diaphragm seals can withstand the cleaning vapour temperatures occurring in the SIP processes and thus ensure a sterile connection between the medium to be measured and the diaphragm seal.

Mounting of the diaphragm seal to the measuring instrument may be made via a direct connection, for high temperatures via a cooling element or via a flexible capillary.

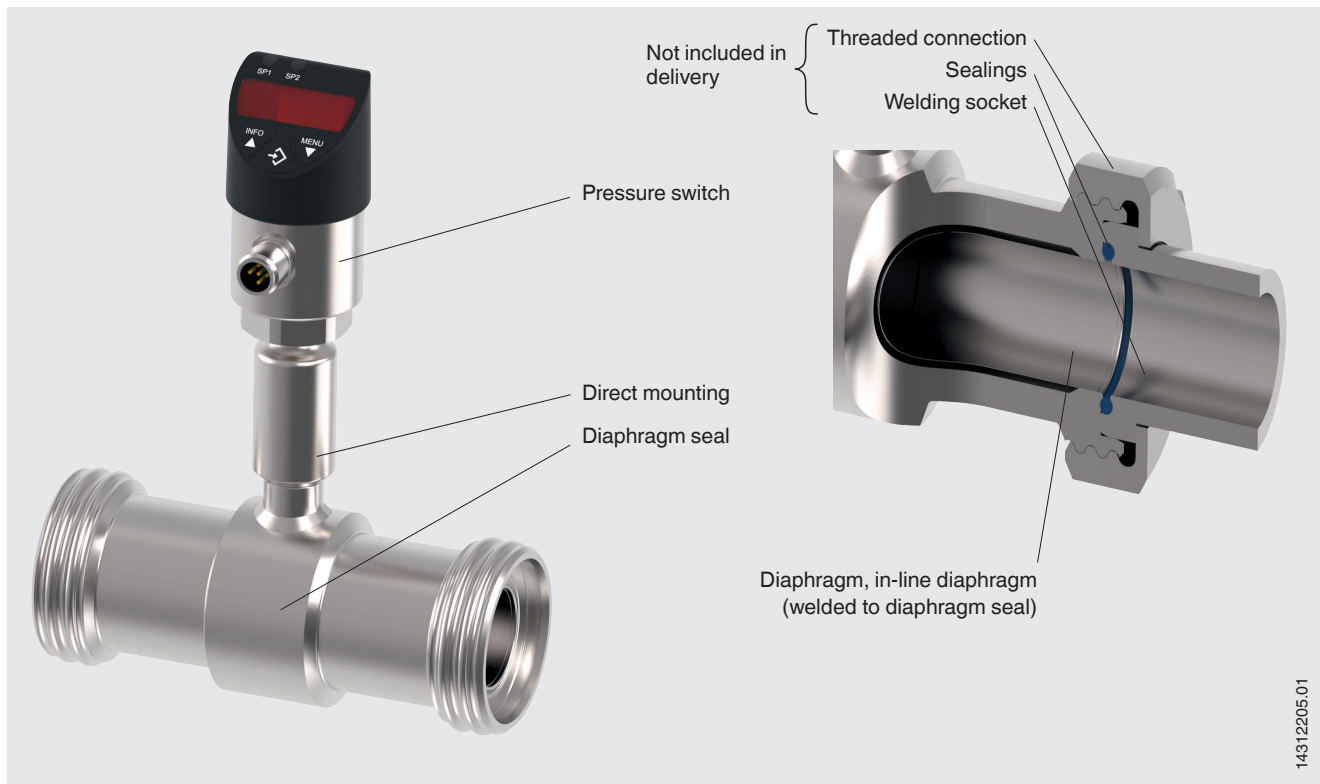
The availability of the diaphragm seals for common pipe standards and nominal widths simplifies integration into already existing pipe cross-sections.

Specifications

Model 981.51	Standard	Option
Pressure range ¹⁾	0 ... 0.6 bar to 0 ... 40 bar [0 ... 8.7 psi to 0 ... 580 psi] or all other equivalent vacuum or combined pressure and vacuum ranges	
Level of cleanliness of wetted parts	Oil and grease free per ASTM G93-03 level F WIKA standard (< 1,000 mg/m ²)	<ul style="list-style-type: none"> ■ Oil and grease free per ASTM G93-03 level D and ISO 15001 (< 220 mg/m²) ■ Oil and grease free per ASTM G93-03 level C and ISO 15001 (< 66 mg/m²)
Origin of wetted parts	International	EU, CH, USA
Surface roughness of wetted parts	Ra ≤ 0.76 μm [30 μin] per ASME BPE SF3 (except for weld seam)	Ra ≤ 0.38 μm [15 μin] per ASME BPE SF4, only with electropolished surface (except for weld seam)
Connection to the measuring instrument	Axial gauge adapter	Axial gauge adapter with G ½, G ¼, ½ NPT or ¼ NPT (female)
Type of mounting	Direct mounting	<ul style="list-style-type: none"> ■ Capillary ■ Cooling element
Vacuum service (see IN 00.25)	Basic service	<ul style="list-style-type: none"> ■ Premium service ■ Advanced service
Process connection	<ul style="list-style-type: none"> ■ Aseptic threaded pipe connection (see page 5) ■ Aseptic flange connection (see from page 6) 	
Marking of the diaphragm seal	-	Per valid 3-A standard
Instrument mounting bracket (only for capillary option)	-	<ul style="list-style-type: none"> ■ Form H per DIN 16281, 100 mm, aluminium, black ■ Form H per DIN 16281, 100 mm, stainless steel ■ Bracket for pipe mounting, for pipe Ø 20 ... 80 mm, steel (see data sheet AC 09.07)

1) The maximum pressure range depends on the selection of the process connection. See PN nominal pressure in the tables from page 5.

Installation example, model 981.51 with aseptic threaded pipe connection directly mounted to model PSD-4 pressure switch

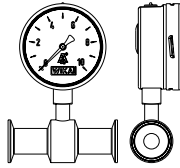


Mounting variants for pressure gauges

For horizontal pipelines

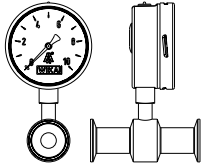
Variant 1

- Connection: Lower mount
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, horizontal pipeline



Variant 2

- Connection: Lower mount
- Pointer shaft: Parallel to flow direction
- Mounting: Direct mounting, horizontal pipeline



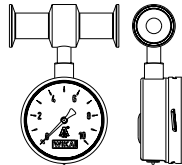
Variant 3

- Connection: Lower back mount
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, horizontal pipeline



Variant 4

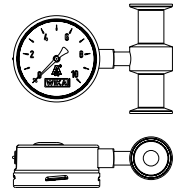
- Connection: "At 12 o'clock"
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, horizontal pipeline



For vertical pipelines

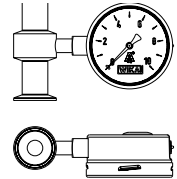
Variant 1

- Connection: "At 3 o'clock"
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, vertical pipeline



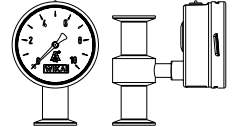
Variant 2

- Connection: "At 9 o'clock"
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, vertical pipeline



Variant 3

- Connection: Lower back mount
- Pointer shaft: Crosswise to flow direction
- Mounting: Direct mounting, vertical pipeline



Material combinations





Upper body of diaphragm seal	Wetted parts (diaphragm) ¹⁾
Stainless steel 1.4435 (316L)	Stainless steel 1.4435 (316L)
Stainless steel 1.4435 (316L), electropolished ²⁾	Stainless steel 1.4435 (316L), electropolished ²⁾
Stainless steel 1.4539 (904L)	Stainless steel 1.4539 (904L)
Hastelloy C22 (2.4602)	Hastelloy C22 (2.4602)
Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)

¹⁾ Marking of the parts with the material code guarantees 100 % material traceability

²⁾ Only in connection with a surface roughness of $R_a \leq 0.38 \mu\text{m}$ [15 μin] for the wetted parts

Further material combinations for special process temperatures on request.

Approvals

Logo	Description	Country
	EU declaration of conformity Pressure equipment directive	European Union
	EAC (option) Pressure equipment directive	Eurasian Economic Community
	3-A Sanitary Standard	USA
	EHEDG ¹⁾ Hygienic Equipment Design	European Union
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada
-	MTSCHS (option) Permission for commissioning	Kazakhstan

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

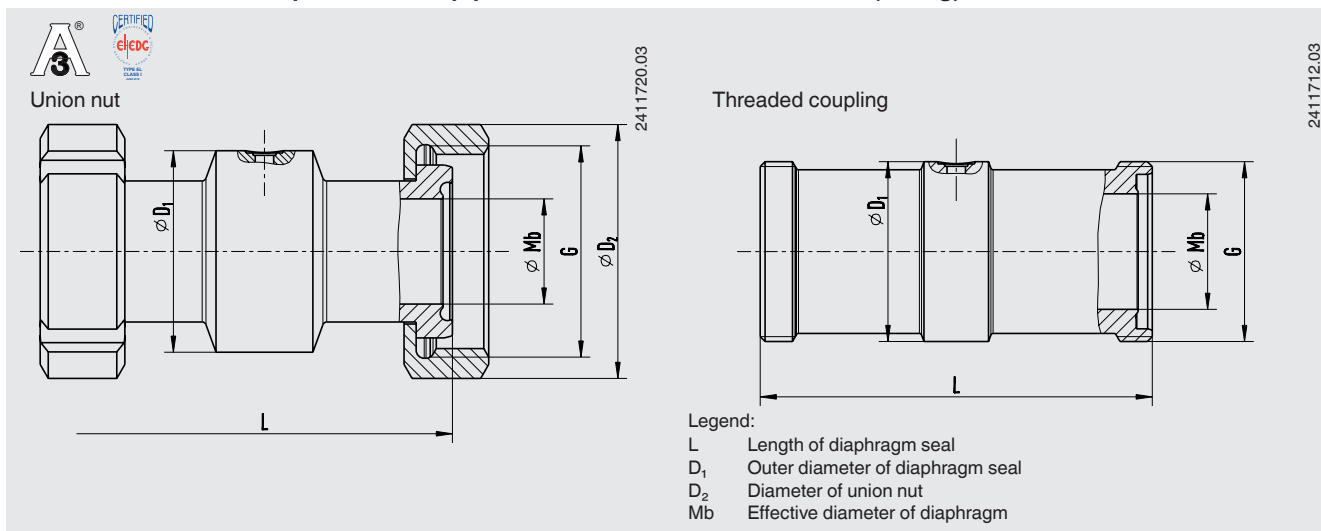
Certificates (option)

- 2.2 test report per EN 10204
 - State-of-the-art manufacturing, material proof, indication accuracy for diaphragm seal systems
 - FDA conformity of the system fill fluid
 - 3-A conformity of the diaphragm seal, based on a third party verification
 - Manufacturer's declaration for food contact materials per regulation (EC) no. 1935/2004
- 3.1 inspection certificate per EN 10204
 - Material proof, wetted metal parts
 - Indication accuracy for diaphragm seal systems
- Manufacturer's declaration for food contact materials per regulation (EC) no. 1935/2004
- Others on request

Approvals and certificates, see website

Dimensions in mm [in]

Process connection: Aseptic threaded pipe connection DIN 11864-1 form A (O-ring)



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

DN	PN	G	Dimensions in mm [in]					
			Pipe outer Ø x wall thickness	L	D ₁	D ₂	Mb	Aseptic O-ring
25	40	RD 52 x 1/8	29 x 1.5 [1.142 x 0.059]	128 [5.039]	52 [2.047]	63 [2.48]	26 [1.024]	28 x 3.5 [1.102 x 0.138]
32	40	RD 58 x 1/8	35 x 1.5 [1.378 x 0.059]	128 [5.039]	58 [2.283]	70 [2.756]	32 [1.26]	34 x 5 [1.339 x 0.197]
40	40	RD 65 x 1/8	41 x 1.5 [1.614 x 0.059]	160 [6.299]	65 [2.559]	78 [3.071]	38 [1.496]	40 x 5 [1.575 x 0.197]
50	25	RD 78 x 1/8	53 x 1.5 [2.087 x 0.059]	170 [6.693]	78 [3.071]	92 [3.622]	50 [1.969]	52 x 5 [2.047 x 0.197]
65	25	RD 96 x 1/8	70 x 2 [2.756 x 0.079]	182 [7.165]	95 [3.74]	112 [4.409]	66 [2.362]	68 x 5 [2.677 x 0.197]
80	25	RD 110 x 1/4	85 x 2 [3.346 x 0.079]	182 [7.165]	110 [4.331]	127 [5]	81 [3.189]	83 x 5 [3.268 x 0.197]
100	25	RD 130 x 1/4	104 x 2 [4.094 x 0.079]	182 [7.165]	130 [5.118]	148 [5.827]	100 [3.937]	102 x 5 [4.016 x 0.197]

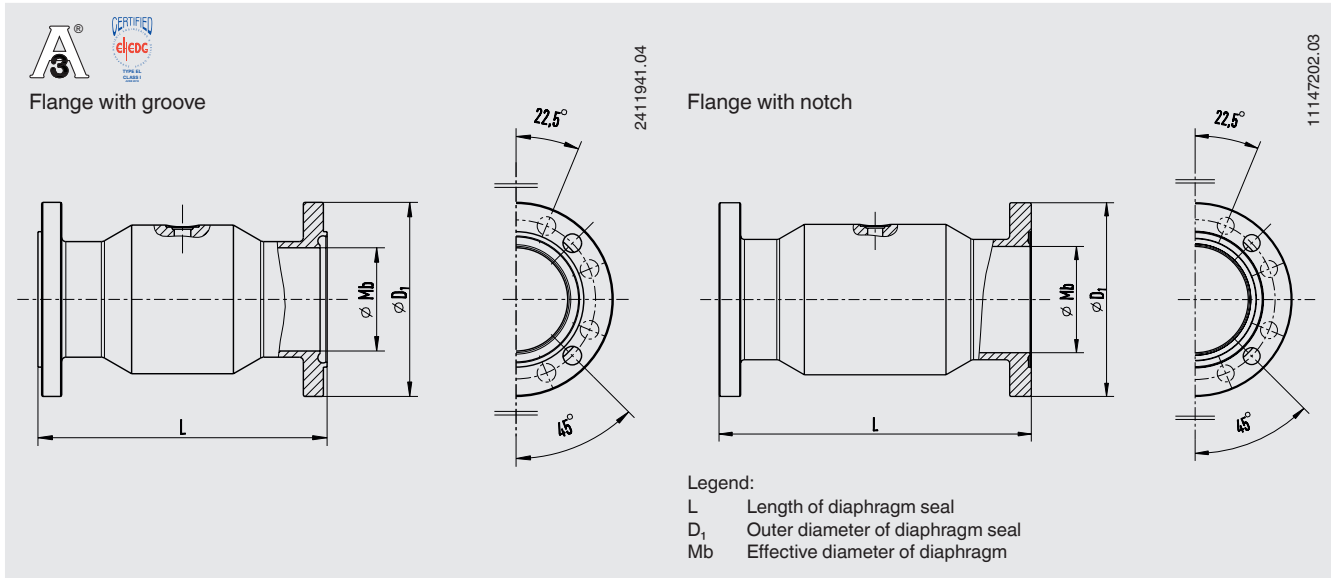
Pipe standard per DIN 11866 row B or DIN ISO 1127 row 1

DN	PN	G	Dimensions in mm [in]					
			Pipe outer Ø x wall thickness	L	D ₁	D ₂	Mb	Aseptic O-ring
26.9	40	RD 52 x 1/8	26 x 1.6 [1.024 x 0.059]	128 [5.039]	52 [2.047]	63 [2.48]	23.7 [0.933]	28 x 3.5 [1.102 x 0.138]
33.7	40	RD 58 x 1/8	33.7 x 2 [1.327 x 0.079]	128 [5.039]	58 [2.283]	70 [2.756]	29.7 [1.169]	34 x 5 [1.339 x 0.197]
42.4	25	RD 65 x 1/8	42.4 x 2 [1.669 x 0.079]	160 [6.299]	65 [2.559]	78 [3.071]	38.4 [1.512]	40 x 5 [1.575 x 0.197]
48.3	25	RD 78 x 1/8	48.3 x 2 [1.902 x 0.079]	170 [6.693]	78 [3.071]	92 [3.622]	44.3 [1.744]	52 x 5 [2.047 x 0.197]
60.3	25	RD 96 x 1/8	60.3 x 2 [2.374 x 0.079]	182 [7.165]	95 [3.74]	112 [4.409]	56.3 [2.217]	68 x 5 [2.677 x 0.197]
76.1	25	RD 110 x 1/4	76.1 x 2 [2.996 x 0.079]	182 [7.165]	110 [4.331]	127 [5]	72.1 [2.839]	83 x 5 [3.268 x 0.197]
88.9	25	RD 130 x 1/4	88.9 x 2 [3.5 x 0.079]	182 [7.165]	130 [5.118]	148 [5.827]	84.3 [3.319]	102 x 5 [4.016 x 0.197]

Pipe standard per DIN 11866 row C or ASME BPE 1997

DN	PN	G	Dimensions in mm [in]					
			Pipe outer Ø x wall thickness	L	D ₁	D ₂	Mb	Aseptic O-ring
1"	40	RD 52 x 1/8	25.4 x 1.65 [1 x 0.059]	128 [5.039]	52 [2.047]	63 [2.48]	22.1 [0.87]	24 x 3.5 [0.945 x 0.138]
1 1/2"	40	RD 65 x 1/8	42.4 x 1.65 [1.669 x 0.059]	160 [6.299]	65 [2.559]	78 [3.071]	34.8 [1.37]	37 x 5 [1.457 x 0.197]
2"	25	RD 78 x 1/8	48.3 x 1.65 [1.902 x 0.059]	170 [6.693]	78 [3.071]	92 [3.622]	47.5 [1.87]	50 x 5 [1.969 x 0.197]
2 1/2"	25	RD 95 x 1/8	60.3 x 1.65 [2.374 x 0.059]	182 [7.165]	95 [3.74]	112 [4.409]	60.2 [2.37]	62 x 5 [2.441 x 0.197]
3"	25	RD 110 x 1/4	76.1 x 1.65 [2.996 x 0.059]	182 [7.165]	110 [4.331]	127 [5]	72.9 [2.87]	75 x 5 [2.953 x 0.197]
4"	25	RD 130 x 1/4	88.9 x 2.11 [3.5 x 0.083]	182 [7.165]	130 [5.118]	148 [5.827]	97.4 [3.835]	100 x 5 [3.937 x 0.197]

Process connection: Aseptic flange connection DIN 11864-2 form A (O-ring)



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

DN	PN	Dimensions in mm [in]				
		Pipe outer Ø x wall thickness	L	D ₁	Mb	Aseptic O-ring
25	25	29 x 1.5 [1.142 x 0.059]	114 [4.489]	70 [2.756]	26 [1.024]	28 x 3.5 [1.102 x 0.138]
32	25	35 x 1.5 [1.378 x 0.059]	-	76 [2.992]	32 [1.26]	34 x 5 [1.339 x 0.197]
40	25	41 x 1.5 [1.614 x 0.059]	-	82 [7.228]	38 [1.496]	40 x 5 [1.575 x 0.197]
50	16	53 x 1.5 [2.087 x 0.059]	156 [6.142]	94 [3.701]	50 [1.969]	52 x 5 [2.047 x 0.197]
65	16	70 x 2 [2.756 x 0.079]	-	113 [4.449]	66 [2.362]	68 x 5 [2.677 x 0.197]
80	16	85 x 2 [3.346 x 0.079]	-	133 [5.236]	81 [3.189]	83 x 5 [3.268 x 0.197]
100	16	104 x 2 [4.094 x 0.079]	-	159 [6.26]	100 [3.937]	102 x 5 [4.016 x 0.197]

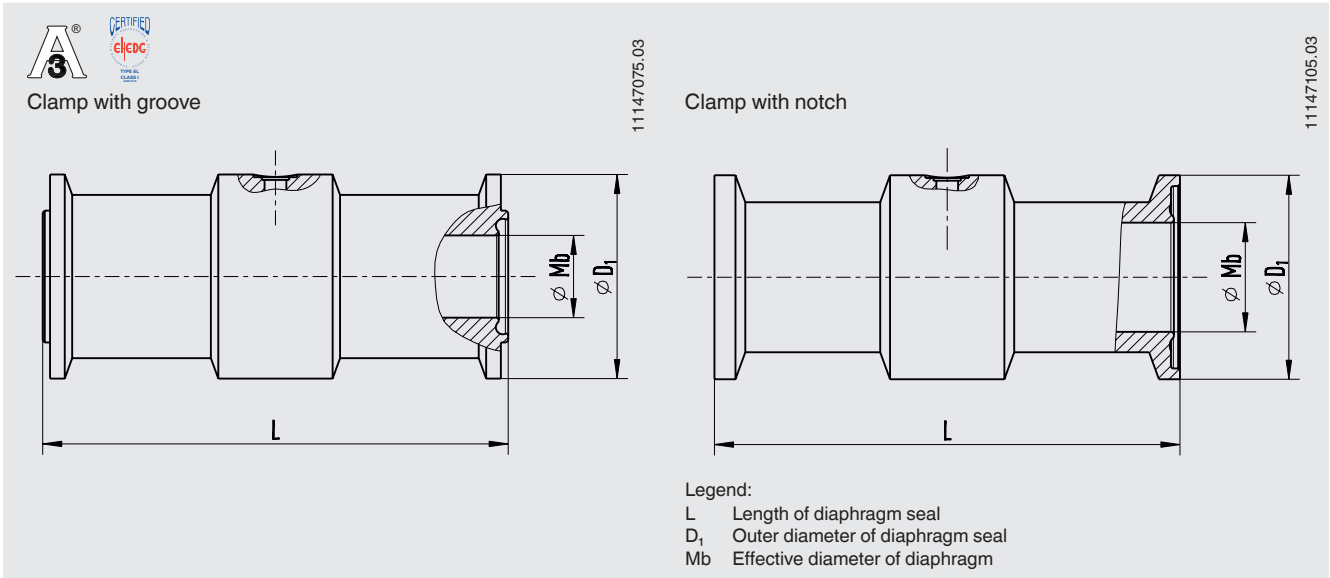
Pipe standard per DIN 11866 row B or DIN ISO 1127 row 1

DN	PN	Dimensions in mm [in]				
		Pipe outer Ø x wall thickness	L	D ₁	Mb	Aseptic O-ring
26.9	25	26 x 1.6 [1.024 x 0.059]	-	69 [2.717]	23.7 [0.933]	26 x 3.5 [1.024 x 0.138]
33.7	25	33.7 x 2 [1.327 x 0.079]	114 [4.489]	74 [2.913]	29.7 [1.169]	32 x 5 [1.26 x 0.197]
42.4	16	42.4 x 2 [1.669 x 0.079]	-	82 [3.228]	38.4 [1.512]	40.5 x 5 [1.594 x 0.197]
48.3	16	48.3 x 2 [1.902 x 0.079]	-	88 [3.465]	44.3 [1.744]	46.5 x 5 [1.831 x 0.197]
60.3	16	60.3 x 2 [2.374 x 0.079]	156 [6.142]	103 [4.055]	56.3 [2.217]	58.5 x 5 [2.303 x 0.197]
76.1	16	76.1 x 2 [2.996 x 0.079]	-	125 [4.921]	72.1 [2.839]	73.5 x 5 [2.894 x 0.197]
88.9	16	88.9 x 2 [3.5 x 0.079]	156 [6.142]	137 [5.394]	84.3 [3.319]	86.5 x 5 [3.406 x 0.197]

Pipe standard per DIN 11866 row C or ASME BPE 1997

DN	PN	Dimensions in mm [in]				
		Pipe outer Ø x wall thickness	L	D ₁	Mb	Aseptic O-ring
1"	25	25.4 x 1.65 [1 x 0.059]	114 [4.489]	50.5 [1.988]	22.1 [0.87]	24 x 3.5 [0.945 x 0.138]
1 ½"	25	42.4 x 1.65 [1.669 x 0.059]	-	64 [2.52]	34.8 [1.37]	37 x 5 [1.457 x 0.197]
2"	16	48.3 x 1.65 [1.902 x 0.059]	-	77.5 [3.051]	47.5 [1.87]	50 x 5 [1.969 x 0.197]
2 ½"	16	60.3 x 1.65 [2.374 x 0.059]	-	91 [3.583]	60.2 [2.37]	62 x 5 [2.441 x 0.197]
3"	16	76.1 x 1.65 [2.996 x 0.059]	-	106 [4.173]	72.9 [2.87]	75 x 5 [2.953 x 0.197]
4"	16	88.9 x 2.11 [3.5 x 0.083]	-	130 [5.118]	97.4 [3.835]	100 x 5 [3.937 x 0.197]

Process connection: Aseptic flange connection DIN 11864-3 form A (O-ring)



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

DN	PN	Dimensions in mm [in]				
		Pipe outer Ø x wall thickness	L	D ₁	Mb	Aseptic O-ring
25	40	29 x 1.5 [1.142 x 0.059]	114 [4.489]	50.5 [1.988]	26 [1.024]	28 x 3.5 [1.102 x 0.138]
32	40	35 x 1.5 [1.378 x 0.059]	-	50.5 [1.988]	32 [1.26]	34 x 5 [1.339 x 0.197]
40	40	41 x 1.5 [1.614 x 0.059]	-	64 [2.52]	38 [1.496]	40 x 5 [1.575 x 0.197]
50	25	53 x 1.5 [2.087 x 0.059]	156 [6.142]	77.5 [3.051]	50 [1.969]	52 x 5 [2.047 x 0.197]
65	25	70 x 2 [2.756 x 0.079]	-	91 [3.583]	66 [2.362]	68 x 5 [2.677 x 0.197]
80	25	85 x 2 [3.346 x 0.079]	-	106 [4.173]	81 [3.189]	83 x 5 [3.268 x 0.197]
100	25	104 x 2 [4.094 x 0.079]	-	130 [5.118]	100 [3.937]	102 x 5 [4.016 x 0.197]

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

DN	PN	Dimensions in mm [in]				
		Pipe outer Ø x wall thickness	L	D ₁	Mb	Aseptic O-ring
26.9	40	26 x 1.6 [1.024 x 0.059]	-	50.5 [1.988]	23.7 [0.933]	26 x 3.5 [1.024 x 0.138]
33.7	40	33.7 x 2 [1.327 x 0.079]	-	50.5 [1.988]	29.7 [1.169]	32 x 5 [1.26 x 0.197]
42.4	25	42.4 x 2 [1.669 x 0.079]	-	64 [2.52]	38.4 [1.512]	40.5 x 5 [1.594 x 0.197]
48.3	25	48.3 x 2 [1.902 x 0.079]	-	64 [2.52]	44.3 [1.744]	46.5 x 5 [1.831 x 0.197]
60.3	25	60.3 x 2 [2.374 x 0.079]	-	91 [3.583]	56.3 [2.217]	58.5 x 5 [2.303 x 0.197]
76.1	25	76.1 x 2 [2.996 x 0.079]	-	106 [4.173]	72.1 [2.839]	73.5 x 5 [2.894 x 0.197]
88.9	25	88.9 x 2 [3.5 x 0.079]	-	119 [4.685]	84.3 [3.319]	86.5 x 5 [3.406 x 0.197]

Pipe standard per DIN 11866 row C or ASME BPE 1997

DN	PN	Dimensions in mm [in]				
		Pipe outer Ø x wall thickness	L	D ₁	Mb	Aseptic O-ring
1"	40	25.4 x 1.65 [1 x 0.059]	114 [4.489]	50.5 [1.988]	22.1 [0.87]	24 x 3.5 [0.945 x 0.138]
1 ½"	40	38.1 x 1.65 [1.5 x 0.059]	-	64 [2.52]	34.8 [1.37]	37 x 5 [1.457 x 0.197]
2"	25	50.8 x 1.65 [2 x 0.059]	-	77.5 [3.051]	47.5 [1.87]	50 x 5 [1.969 x 0.197]
2 ½"	25	63.5 x 1.65 [2.5 x 0.059]	-	91 [3.583]	60.2 [2.37]	62 x 5 [2.441 x 0.197]
3"	25	76.2 x 1.65 [3 x 0.059]	-	106 [4.173]	72.9 [2.87]	75 x 5 [2.953 x 0.197]
4"	25	101.6 x 2.11 [4 x 0.083]	-	130 [5.118]	97.4 [3.835]	100 x 5 [3.937 x 0.197]

Ordering information

Diaphragm seal:

Diaphragm seal model / Process connection (type of process connection, pipe standard, pipe dimension) / Material (base body, diaphragm) / Surface roughness of wetted parts / Sealing / Zero point stabilisation (ZPS) / Connection to the measuring instrument / Level of cleanliness of wetted parts / Origin of wetted parts / Certificates

Diaphragm seal system:

Diaphragm seal model / Process connection (type of process connection, pipe standard, pipe dimension) / Material (base body, diaphragm) / Surface roughness of wetted parts / Sealing / Zero point stabilisation (ZPS) / Pressure measuring instrument model (per data sheet) / Mounting (direct mounting horizontal/vertical, cooling element horizontal/vertical, capillary) / min. and max. process temperature / min. and max. ambient temperature / Vacuum service / System fill fluid / Certificates / Height difference / Level of cleanliness of wetted parts / Origin of wetted parts / Instrument mounting bracket

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