

# Diaphragm seal with sterile connection With clamp connection (TRI-CLAMP®) Models 990.22, 990.52 and 990.53

WIKA data sheet DS 99.41



for further approvals  
see page 7

## Applications

- Sanitary applications
- Gases, compressed air, vapour; liquid, pasty, powdery and crystallising media
- Ultra-pure steam systems
- Mounting to pipelines and vessels
- Pressure/vacuum monitoring, e.g. vacuum conveyors, pump monitoring

## Special features

- Quick cleaning, without residue
- Clamp connection easy to open for cleaning and seal replacement
- Suitable for SIP and CIP
- EHEDG certified and 3-A compliant
- Compliant per ASME BPE

## 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 are 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".

TRI-CLAMP® is a trademark of the company Alfa Laval AB SE



Diaphragm seal with sterile connection, model 990.22

Due to their hygienic process connection, the model 990.22, 990.52 and 990.53 diaphragm seals are particularly well 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.

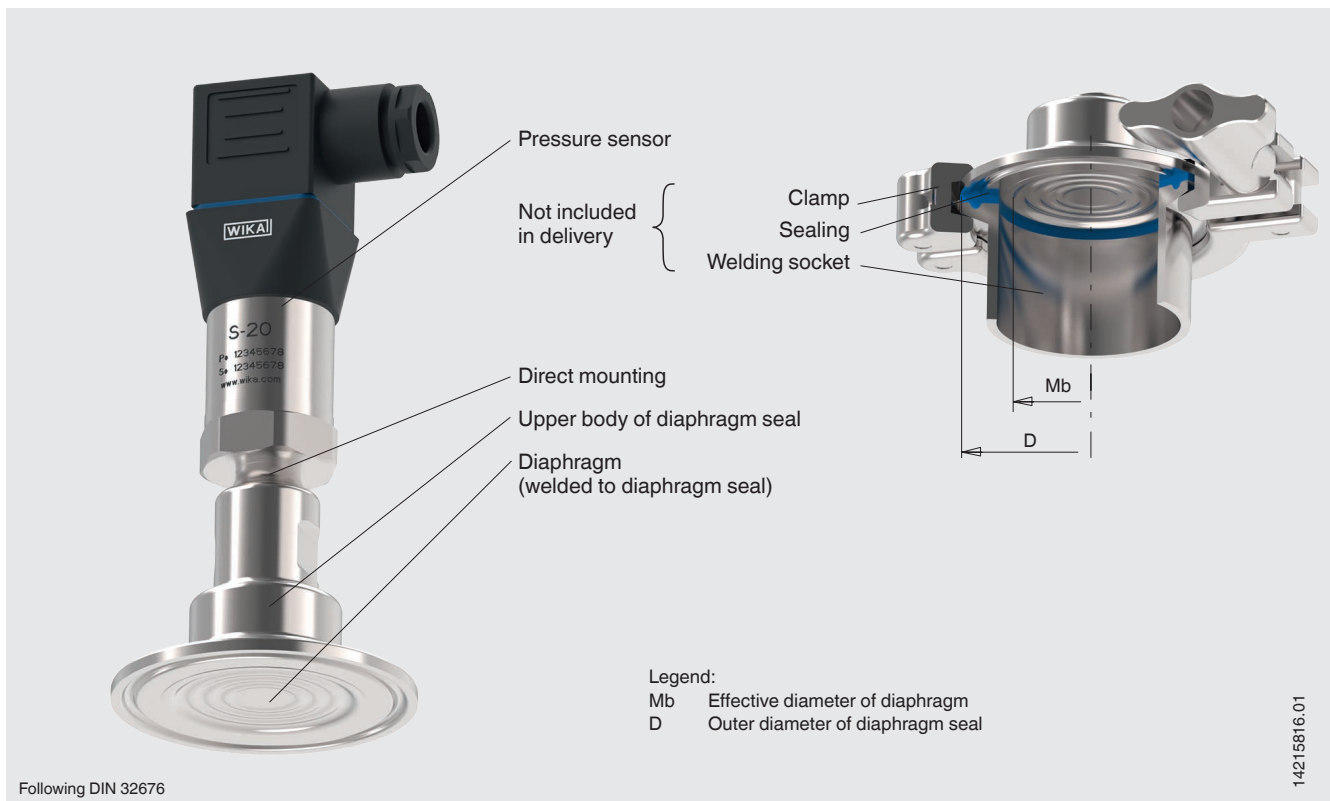
For the material selection WIKA offers a variety of solutions, in which the upper body of the diaphragm seal and the wetted parts can be made of identical or different materials. The wetted parts can, as an alternative, be electropolished.

## Specifications

Models 990.22, 990.52 and 990.53	Standard	Option
<b>Pressure range</b>	0 ... 0.6 bar to 0 ... 40 bar [0 ... 8.7 psi to 0 ... 580 psi] <sup>1)</sup> or all other equivalent vacuum or combined pressure and vacuum ranges	
<b>Level of cleanliness of wetted parts</b>	Oil and grease free per ASTM G93-03 level F WIKA standard (< 1,000 mg/m <sup>2</sup> )	<ul style="list-style-type: none"> <li>■ Oil and grease free per ASTM G93-03 level D and ISO 15001 (&lt; 220 mg/m<sup>2</sup>)</li> <li>■ Oil and grease free per ASTM G93-03 level C and ISO 15001 (&lt; 66 mg/m<sup>2</sup>)</li> </ul>
<b>Origin of wetted parts</b>	International	<ul style="list-style-type: none"> <li>■ EU</li> <li>■ CH</li> <li>■ USA</li> </ul>
<b>Surface roughness of wetted parts</b>	Ra ≤ 0.76 µm per ASME BPE SF3 (except for weld seam)	Ra ≤ 0.38 µm per ASME BPE SF4, only with electropolished surface (except for weld seam)
<b>Connection to the measuring instrument</b>	Axial adapter	Axial adapter with G ½, G ¼, ½ NPT or ¼ NPT (female)
<b>Type of mounting</b>	Direct mounting	<ul style="list-style-type: none"> <li>■ Capillary</li> <li>■ Cooling element</li> </ul>
<b>Vacuum service (see IN 00.25)</b>	Basic service	<ul style="list-style-type: none"> <li>■ Premium service</li> <li>■ Advanced service</li> </ul>
<b>Marking of the diaphragm seal</b>	-	Per valid 3-A standard
<b>Instrument mounting bracket (only for capillary option)</b>	-	<ul style="list-style-type: none"> <li>■ Form H per DIN 16281, 100 mm, aluminium, black</li> <li>■ Form H per DIN 16281, 100 mm, stainless steel</li> <li>■ Bracket for pipe mounting, for pipe Ø 20 ... 80 mm, steel (see data sheet AC 09.07)</li> </ul>

1) Higher nominal pressures on request (for maximum pressure range consider pressure rating of clamp closure)

### Installation example, model 990.22 directly mounted to pressure sensor S-20, illustrated on a pipe socket



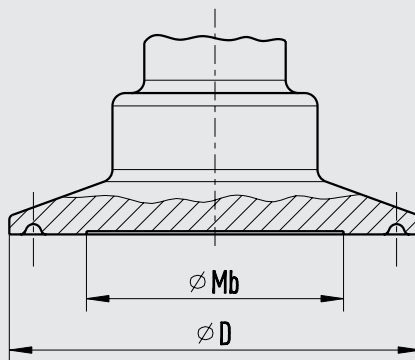
## Material combinations

Upper body of diaphragm seal	Wetted parts	Maximum permissible process temperature <sup>1)</sup> in °C [°F]
Stainless steel 1.4435 (316L)	Stainless steel 1.4435 (316L)	400 [752]
Hastelloy C22 (2.4602)	Hastelloy C22 (2.4602)	
Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)	

1) The maximum permissible process temperature is limited by the joining method and by the system fill fluid.

Further material combinations for special process temperatures on request

## Model 990.22



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**Process connection: Clamp connection per DIN 32676**  
**Pipe standard per DIN 11866 row B and ISO 1127 row 1**

DN	PN <sup>1)</sup>	Dimensions in mm [in]			
		For pipe outer $\varnothing$ x wall thickness	Pipe inner $\varnothing$	D	Mb
26.9	40	26.9 x 1.6 [1.059 x 0.063]	23.7 [0.933]	50.5 [1.988]	22 [0.866]
33.7	40	33.7 x 2 [1.327 x 0.079]	29.7 [1.169]	50.5 [1.988]	25 [0.984]
42.4	40	42.4 x 2 [1.669 x 0.079]	38.4 [1.512]	64 [2.52]	32 [1.26]
48.3	40	48.3 x 2 [1.902 x 0.079]	44.3 [1.744]	64 [2.52]	40 [1.575]
60.3	40	60.3 x 2 [2.374 x 0.079]	56.3 [2.217]	77.5 [3.051]	52 [2.047]
76.1	25	76.1 x 2 [2.996 x 0.079]	72.1 [2.839]	91 [3.583]	72 [2.835]

**Process connection: Clamp connection per DIN 32676**  
**Pipe standard per DIN 11866 row C or ASME BPE**

DN	PN <sup>1)</sup>	Dimensions in mm [in]			
		For pipe outer $\varnothing$ x wall thickness	Pipe inner $\varnothing$	D	Mb
1"	40	25.4 x 1.65 [1 x 0.065]	22.1 [0.87]	50.5 [1.988]	22 [0.866]
1 1/2"	40	38.1 x 1.65 [1.5 x 0.065]	34.8 [1.37]	50.5 [1.988]	32 [1.26]
2"	40	50.8 x 1.65 [2 x 0.065]	47.5 [1.87]	64 [2.52]	40 [1.575]
2 1/2"	40	63.5 x 1.65 [2.5 x 0.065]	60.2 [2.37]	77.5 [3.051]	52 [2.047]
3"	25	76.2 x 1.65 [3 x 0.065]	72.9 [2.87]	91 [3.583]	72 [2.835]

**Process connection: Clamp connection per BS4825 Part 3**  
**Pipe standard per BS4825 part 3 and O.D. tube**

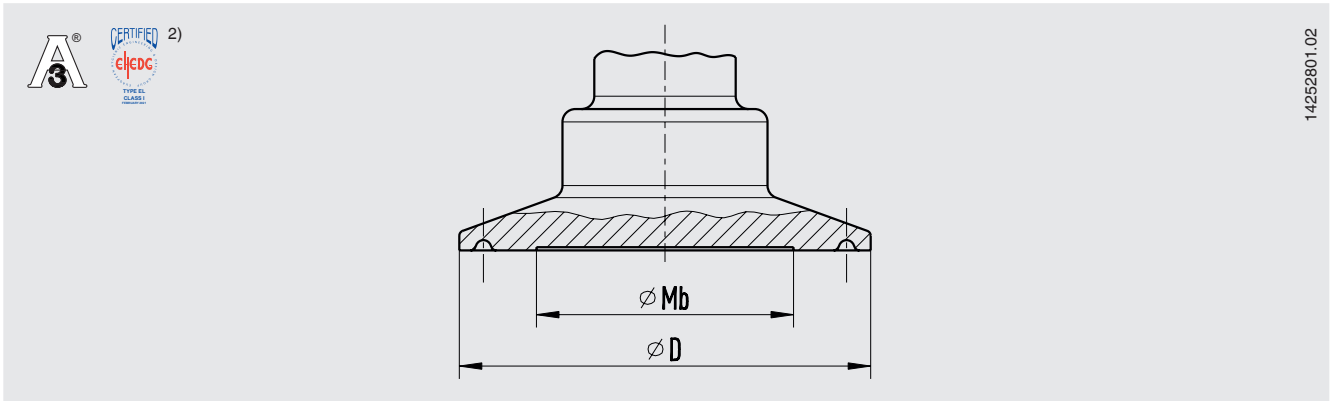
DN	PN <sup>1)</sup>	Dimensions in mm [in]			
		For pipe outer $\varnothing$ x wall thickness	Pipe inner $\varnothing$	D	Mb
25,4	40	25.4 x 1.6 [1 x 0.063]	22.2 [0.874]	50.5 [1.988]	22 [0.866]
38,1	40	38.1 x 1.6 [1.5 x 0.063]	34.9 [1.374]	50.5 [1.988]	32 [1.26]
50,8	40	50.8 x 1.6 [2 x 0.063]	47.6 [1.874]	64 [2.52]	40 [1.575]
63,5	40	63.5 x 1.6 [2.5 x 0.063]	60.3 [2.374]	77.5 [3.051]	52 [2.047]
76,2	25	76.2 x 1.6 [3 x 0.063]	73 [2.874]	91 [3.583]	72 [2.835]

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

2) EHDG conformity only in combination with in combination with TRI-CLAMP® seals Combifit International B.V., The Netherlands.

Further dimensions and higher nominal pressures on request

## Model 990.52



**Process connection: Clamp connection per DIN 32676**  
**Pipe standard per DIN 11866 row A and DIN 11850 row 2**

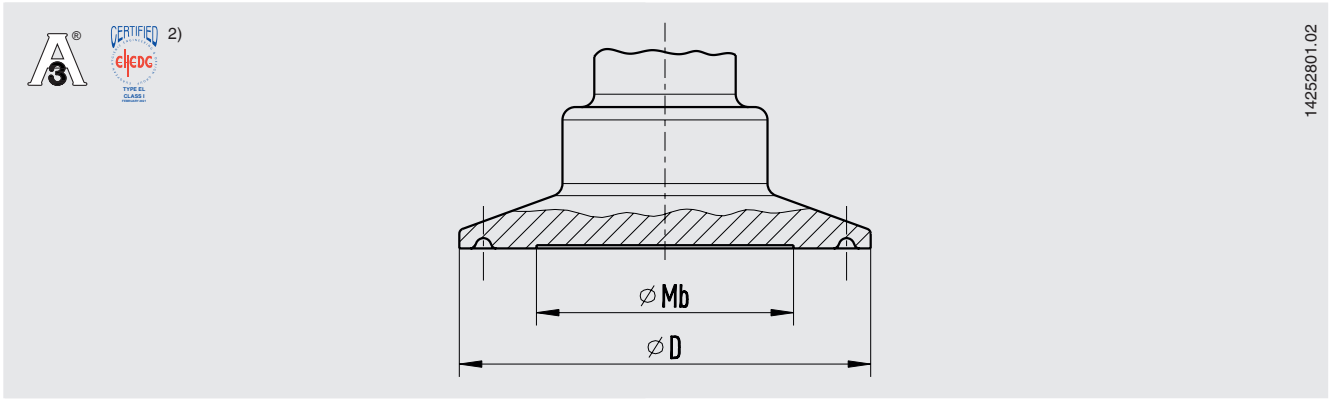
DN	PN <sup>1)</sup>	Dimensions in mm [in]			
		For pipe outer $\varnothing$ x wall thickness	Pipe inner $\varnothing$	D	Mb
25	40	29 x 1.5 [x 0.059]	26 [1.024]	50.5 [1.988]	25 [0.984]
32	40	35 x 1.5 [x 0.059]	32 [1.26]	50.5 [1.988]	29 [1.142]
40	40	41 x 1.5 [x 0.059]	38 [1.496]	50.5 [1.988]	32 [1.26]
50	40	53 x 1.5 [x 0.059]	50 [1.969]	64 [2.52]	40 [1.575]
65	25	70 x 2 [x 0.079]	66 [2.598]	91 [3.583]	60 [2.362]
80	25	85 x 2 [x 0.079]	81 [3.189]	106 [4.173]	72 [2.835]
100	25	104 x 2 [x 0.079]	100 [3.937]	119 [4.685]	90 [3.543]

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

2) EHEDC conformity only in combination with in combination with TRI-CLAMP® seals Combifit International B.V., The Netherlands.

Further dimensions and higher nominal pressures on request

# Model 990.53



**Process connection: Clamp connection per ISO 2852**  
**Pipe standard per ISO 2037 and BS 4825 part 1**





DN	PN <sup>1)</sup>	Dimensions in mm [in]			
		For pipe outer $\varnothing$ x wall thickness	Pipe inner $\varnothing$	D	Mb
25	40	25 x 1.2 [0.984 x 0.047]	22.6 [0.89]	50.5 [1.988]	22 [0.866]
33.7	40	33.7 x 1.2 [1.327 x 0.047]	31.3 [1.232]	50.5 [1.988]	25 [0.984]
38	40	38 x 1.2 [1.496 x 0.047]	35.6 [1.402]	50.5 [1.988]	32 [1.26]
40	40	40 x 1.2 [1.575 x 0.047]	37.6 [1.48]	64 [2.52]	32 [1.26]
51	40	51 x 1.2 [2.008 x 0.047]	48.6 [1.913]	64 [2.52]	40 [1.575]
63.5	40	63.5 x 1.6 [2.5 x 0.063]	60.3 [2.374]	77.5 [3.051]	52 [2.047]
70	25	70 x 1.6 [2.756 x 0.063]	66.8 [2.63]	91 [3.583]	60 [2.362]
76.1	25	76.1 x 1.6 [2.996 x 0.063]	72.9 [2.87]	91 [3.583]	72 [2.835]
88.9	25	88.9 x 2 [3.5 x 0.079]	84.9 [3.343]	106 [4.173]	72 [2.835]
101.6	25	101.6 x 2 [4 x 0.079]	97.6 [3.843]	119 [4.685]	90 [3.543]

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

2) EHEG conformity only in combination with in combination with TRI-CLAMP® seals Combifit International B.V., The Netherlands.

Further dimensions and higher nominal pressures on request

## Approvals

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

## Certificates (option)

- 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy for diaphragm seal systems)
- 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metallic parts, 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
- EHEDG conformity
- Manufacturer's declaration for food contact materials regarding regulation (EC) No. 1935/2004
- Others on request

Approvals and certificates, see website

## Ordering information

Diaphragm seal:

Diaphragm seal model / Process connection (type of process connection, pipe standard, pipe dimension) / Material (upper body, diaphragm) / Surface roughness of wetted parts / Sealing / 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 (upper body, diaphragm) / Surface roughness of wetted parts / Sealing / Pressure measuring instrument model (per data sheet) / Mounting (direct mounting, cooling element, 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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