

# Diaphragm seal with sterile connection

## For sanitary applications

### Models 990.22, 990.52 and 990.53, clamp connection

WIKA data sheet DS 99.41



for further approvals  
see page 3

#### Applications

- Food and beverage production
- Pharmaceutical industry, biotechnology, production of active ingredients
- Aseptic applications

#### Special features

- For cleaning easy to open
- Quick cleaning of measuring point, without residue
- Suitable for SIP and CIP
- 3-A compliant
- Compliant per ASME BPE

#### Description

Diaphragm seals are used to protect the pressure measuring instrument from aggressive, adhesive, crystallising, corrosive, highly viscous, environmentally hazardous or toxic media. A diaphragm made of the appropriate material provides for the separation from the medium to be measured. Thus even the most difficult measuring requirements can be met by combining measuring instruments with diaphragm seals.

A fluid inside the system, which can be chosen to suit the particular application, hydraulically transmits the pressure to the measuring instrument.

Almost limitless application possibilities exist due to the large number of available variants, such as diaphragm seal designs or materials. The type of process connection (flange, threaded and sterile connection) and the basic method of manufacture are important design differentiation criteria.

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



#### Diaphragm seal with sterile connection, model 990.22

The models 990.22, 990.52 and 990.53 diaphragm seals with clamp connection have been specifically developed for use in sterile processes and are integrated into the process by means of a clamp. This enables a hygienic integration of the measuring instrument into the process.

The diaphragm seal systems 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.

Assembly of the diaphragm seal and measuring instrument is made via a direct assembly as standard or optionally via a cooling element or a flexible capillary.

For the material selection WIKA offers a variety of solutions, in which the upper part and the diaphragm are made of identical materials. Stainless steel 316L (1.4435) is used as standard material, other special materials are available on request.

Measuring systems with model 990.22, 990.52 and 990.53 WIKA diaphragm seals are successfully used in the life science industry, in food production, pharmaceutical and biotechnology applications.

## Standard version

### Type of process connection

Model 990.22: Clamp connection

Model 990.52: Clamp connection per DIN 32676

Model 990.53: Clamp connection per ISO 2852

For exact designs and nominal widths see tables on page 4

### Nominal pressure

See tables on page 4

### Measuring ranges

min. 0 ... 0.6 bar, max. 0 ... 40 bar

(also vacuum and +/- measuring ranges)

### Material of upper body

CrNi-Stahl 1.4435 (316 L)

### Material of wetted parts

Diaphragm: Stainless steel 1.4435 (316L)

### Surface roughness of the wetted parts

$Ra \leq 0.76 \mu\text{m}$  per ASME BPE SF3 (except for weld seam)

### Level of cleanliness of wetted parts

Oil and grease free per ASTM G93-03 level E (WIKA standard) and ISO 15001 ( $< 550 \text{ mg/m}^2$ )

### Connection to measuring instrument

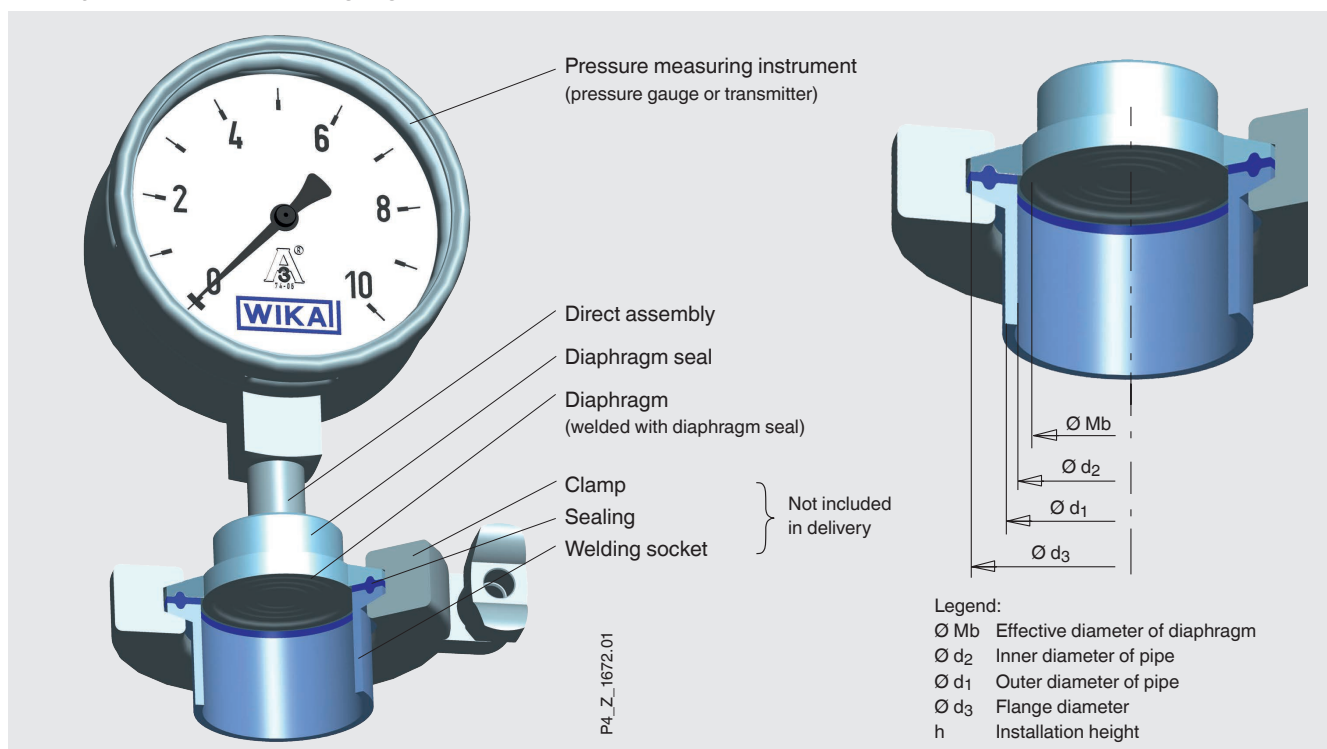
Axial weld-in connection

## Options

- Higher nominal pressures on request (for maximum pressure range consider pressure rating of clamp)
- Surface roughness of the wetted parts  $Ra \leq 0.38 \mu\text{m}$  per ASME BPE SF4, only with electropolished surface (except for weld seam)
- Sealing from EPDM or PTFE
- Connection to measuring instrument  
G 1/2, G 1/4, 1/2 NPT or 1/4 NPT (female)
- Origin of wetted parts (EU, CH, USA)
- Marking of the diaphragm seal with 3-A standard 74-06

## Installation example

Diaphragm seal, sterile connection, model 990.22 with directly assembled pressure gauge on a pipe socket



## Additional information for diaphragm seal systems

See Technical information IN 00.06 "Diaphragm seals - Diaphragm seal systems, application, operating principle, designs"

- Pressure measuring instrument model
- Connection to the measuring instrument: Direct assembly (calibrated in vertical mounting position, process connection facing downwards)
- Process temperature
- Ambient temperature
- System fill fluid
  - Recommendation for the food and beverage production: Neobee® KN 59 (FDA 21 CFR 172.856, 21 CFR 174.5)
  - Recommendation for pharmaceutical and cosmetics applications: Medicinal white mineral oil KN 92 (FDA 21 CFR 172.878, 21 CFR 178.3620(a); USP, EP, JP)

## Options for diaphragm seal systems

- Connection to the measuring instrument via cooling element or capillary
- Vacuum service (suitable for vacuum operation)
- Higher level of cleanliness of wetted parts
  - Oil and grease free per ASTM G93-03 level C and ISO 15001 (< 66 mg/m<sup>2</sup>)
- Height difference between measuring point and pressure measuring instrument with capillary in metre increments (max. 7 m with silicone oils/edible oils)
- Mounting bracket (required for connection to the measuring instrument via capillary)
  - 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

## Materials

Upper body	Wetted part Diaphragm
<b>Standard</b>	
Stainless steel 1.4435 (316L)	Stainless steel 1.4435 (316L)
<b>Option</b>	
Stainless steel 1.4435 (316L), electropolished	Stainless steel 1.4435 (316L), electropolished
Stainless steel 1.4539 (904L)	Stainless steel 1.4539 (904L)
Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)
Hastelloy C22 (2.4602)	Hastelloy C22 (2.4602)

Further material combinations on request

## Approvals

- **GOST-R**, import certificate, Russia
- **CRN**, safety (e.g. electr. safety, overpressure, ...), Canada

## Certificates <sup>2)</sup>

- 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, in accordance with 3-A standard 74-06
- EHEDG conformity of the model 990.53 diaphragm seal (only in combination with a Kalrez® stainless steel gasket from Dupont de Nemours or with a T-ring seal from Combifit International B.V.)
- Manufacturer's declaration regarding EU regulation 1935/2004 EC
- Others on request

<sup>2)</sup> Option

For approvals and certificates see website

## Dimensions in mm

### Model 990.22

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 <sup>1)</sup>	Dimensions in mm		
			d <sub>3</sub>	d <sub>2</sub>	Mb
26.9	26.9 x 1.6	40	50.5	23.7	22
33.7	33.7 x 2	40	50.5	29.7	25
42.4	42.4 x 2	40	64	38.4	32
48.3	48.3 x 2	40	64	44.3	40
60.3	60.3 x 2	40	77.5	56.3	52
76.1	76.1 x 2	25	91	72.1	59

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

Type of process connection: Clamp connection

Pipe standard: Pipes per BS4825 part 3 and O.D.-Tube

DN	For pipe Outer Ø x wall thickness	PN <sup>1)</sup>	Dimensions in mm		
			d <sub>3</sub>	d <sub>2</sub>	Mb
1"	25.4 x 1.6	40	50.5	22.1	22
1 ½"	38.1 x 1.6	40	50.5	34.9	32
2"	50.8 x 1.6	40	64	47.6	40
2 ½"	63.5 x 1.6	40	77.5	60.3	52
3"	76.2 x 1.6	25	91	73.0	59

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

### Model 990.52

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 <sup>1)</sup>	Dimensions in mm		
			d <sub>3</sub>	d <sub>2</sub>	Mb
25	29 x 1.5	40	50.5	26	25
32	35 x 1.5	40	50.5	32	29
40	41 x 1.5	40	50.5	38	32
50	53 x 1.5	40	64	50	40
65	70 x 2	25	91	66	59
80	85 x 2	25	106	81	72
100	104 x 2	25	119	100	89

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

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 <sup>1)</sup>	Dimensions in mm		
			d <sub>3</sub>	d <sub>2</sub>	Mb
1"	25.4 x 1.65	40	50.5	22.1	22
1 ½"	38.1 x 1.65	40	50.5	34.8	32
2"	50.8 x 1.65	40	64	47.5	40
2 ½"	63.5 x 1.65	40	77.5	60.2	52
3"	76.2 x 1.65	25	91	72.9	59

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

### Model 990.53

Type of process connection: Clamp  
connection per ISO 2852

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



DN	For pipe Outer Ø x wall thickness	PN <sup>1)</sup>	Dimensions in mm		
			d <sub>3</sub>	d <sub>2</sub>	Mb
25	25 x 1.2	40	50.5	22.6	22
28	28 x 1.2	40	50.5	25.6	22
33.7	33.7 x 1.2	40	50.5	31.3	25
38	38 x 1.2	40	50.5	35.6	32
40	40 x 1.2	40	64	37.6	32
51	51 x 1.2	40	64	48.6	40
63.5	63.5 x 1.6	40	77.5	60.3	52
70	70 x 1.6	25	91	66.8	59
76.1	76.1 x 1.6	25	91	72.9	59
88.9	88.9 x 2	25	106	84.9	72
101.6	101.6 x 2	25	119	97.6	89

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

2) Observe the note on EHDG conformity on page 3 under "Certificates".

### 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) / Assembly (direct assembly, 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 / Mounting bracket

© 2004 WIKA Alexander Wiegand SE & Co. KG, all rights reserved.  
The specifications given in this document represent the state of engineering at the time of publishing.  
We reserve the right to make modifications to the specifications and materials.

