

Diaphragm seal with flange connection

Threaded design, large working volume

Model 990.41

WIKA data sheet DS 99.32



for further approvals
see page 3

Applications

- For assembly (direct assembly, via a cooling element or a capillary) with measuring instruments for low pressures and with differential pressure measuring instruments
- For aggressive, contaminated or hot media
- Chemical process industry, petrochemical industry
- Level measurement, filter monitoring

Special features

- Internal diaphragm with large working volume
- Special materials available
- Low temperature error due to large diaphragm diameter (realisation of low measuring ranges possible)
- Wide temperature application range due to large working volume
- Integrated flushing connections (optional)

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 flange connection, model 990.41

The model 990.41 diaphragm seal with flange connection and internal diaphragm is ideally suited for applications with small process connections. Due to the internal diaphragm (large diaphragm diameter) low measuring ranges can be realised. When the temperature changes, the diaphragm counteracts the volume expansion of the system fill fluid, thus ensuring a lower deviation at the measuring instrument.

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 body, the diaphragm and the lower body can be made of identical or different materials. The diaphragm and the lower body can also be offered coated or covered with foils.

Measuring systems with model 990.41 WIKA diaphragm seals are successfully used worldwide in the chemical process and petrochemical industries with high measuring requirements.

Standard version

Process connection

Flanges

Standard	Nominal width	Sealing face
following EN 1092-1	DN 15	Form B1
	DN 20	
	DN 25	
	DN 40	
	DN 50	
following ASME B 16.5	1/2"	RF 125 ... 250 AA
	3/4"	
	1"	
	1 1/2"	
	2"	

Nominal pressure

PN 100 with diaphragm Ø 89 mm

Measuring ranges

max. 0 ... 100 bar (diaphragm Ø 89 mm and max. 200 °C)

Material of upper body

Stainless steel 1.4404 (316 L)

Material of wetted parts

Diaphragm: Stainless steel 1.4435 (316L)

Lower body/sealing face: Stainless steel 1.4404 (316L)

Sealing: PTFE, up to a maximum of 260 °C

Lower body (process connection)

Connecting flange per EN 1092-1 or ASME B 16.5 (for possible nominal widths see page 5 ff.)

Retainer parts

Connecting screws from stainless steel

Level of cleanliness of wetted parts

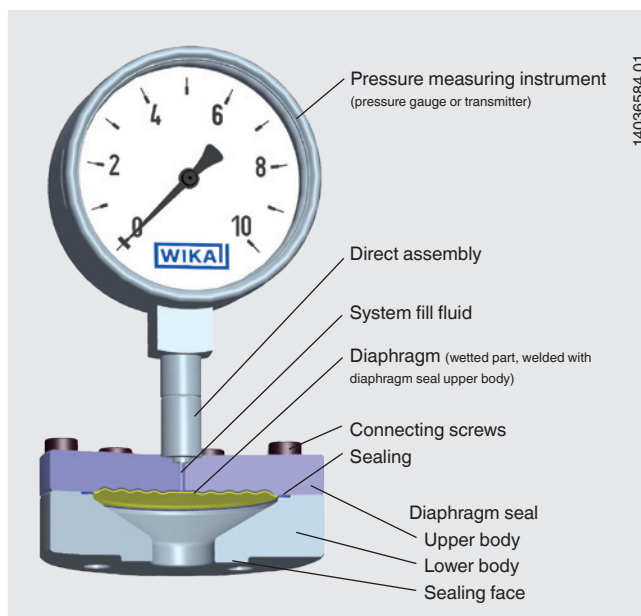
Oil and grease free per ASTM G93-03 level E (WIKA standard) and ISO 15001 (< 550 mg/m²)

Connection to the measuring instrument

Axial weld-in connection

Installation example

Diaphragm seal, flange connection, model 990.41 with pressure gauge



Options

Process connection

Standard	Nominal width	Sealing face
following EN 1092-1	DN 15	Form B2 Form C (tongue)
	DN 20	Form D (groove) Form E (spigot with form B1)
	DN 25	Form E (spigot with form B2) Form F (recess with form B1)
	DN 40	Form F (recess with form B2) Form G (O-ring spigot)
	DN 50	Form H (O-ring groove)
following ASME B 16.5	1/2"	RFSF Small tongue Large tongue
	3/4"	Large male face Small male face
	1"	Small groove Large groove
	1 1/2"	Small female face Large female face
	2"	RJF groove
following JIS	DN 25A	RF 125 ... 250 AA
	DN 40A	
	DN 50A	

(limited with special materials, on request)

Other flanges on request

- Nominal pressure
 - PN 16 with diaphragm Ø 124 mm
- Lower body (process connection)
 - Special materials, solid, lined or coated
 - Lower body with 1 or 2 flushing connections 1/4 NPT, 1/8 NPT, G 1/8
 - Locking screw on the flushing connection
- Sealing
 - Statotherm (graphite), up to a maximum of 400 °C
- Retainer parts
 - Connecting screws from stainless steel, highly heat-resistant
- Connection to the measuring instrument
 - G 1/2, G 1/4, 1/2 NPT or 1/4 NPT (female)
- Higher level of cleanliness of wetted parts
 - 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)
- Design per NACE (MR 0175 or MR 0103)
- Origin of wetted parts (EU, CH, USA)

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

Options for diaphragm seal systems

- Connection to the measuring instrument via cooling element or capillary
- Height difference between measuring point and pressure measuring instrument with capillary in metre increments (max. 7 m with silicone oils)
- Vacuum service (suitable for vacuum operation)
- Diaphragm seals for mounting to zone 0
 - with flame arrester
 - with flame arrester and PTB certificate
- 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

Approvals

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

Certificates ¹⁾

- 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)

¹⁾ Option

Approvals and certificates, see website

Materials

Upper body	Wetted part Diaphragm	Lower body/sealing face	Process temperature limit in °C
Standard			
Stainless steel 1.4404 (316L)	Stainless steel 1.4435 (316L)	Stainless steel 1.4404 (316L)	400
Option			
Stainless steel 1.4404 (316L)	ECTFE coating	ECTFE coating	150 1) 2)
	PFA coating	PFA coating	260 1) 2)
	Gold plating	Gold plating	400 2) 3)
	PTFE foil	Stainless steel 1.4404 (316L) with PTFE foil	260 1) 2)
	Wikaramic®	Wikaramic®	400 1) 2) 3)
	Hastelloy C22 (2.4602)	Hastelloy C22 (2.4602)	260
	Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)	400
	Inconel 600 (2.4816)	Inconel 600 (2.4816)	400
	Inconel 625 (2.4856)	Inconel 625 (2.4856)	400
	Incoloy 825 (2.4858)	Incoloy 825 (2.4858)	400
	Monel 400 (2.4360)	Monel 400 (2.4360)	400
	Tantalum	Stainless steel 1.4404 (316L) with tantalum lining	300 1) 2)
Stainless steel 1.4435 (316L)	Stainless steel 1.4435 (316L)	Stainless steel 1.4435 (316L)	400
Stainless steel 1.4539 (904L)	Stainless steel 1.4539 (904L)	Stainless steel 1.4539 (904L)	400
Stainless steel 1.4541 (321)	Stainless steel 1.4541 (321)	Stainless steel 1.4541 (321)	400
Stainless steel 1.4571 (316Ti)	Stainless steel 1.4571 (316Ti)	Stainless steel 1.4571 (316Ti)	400
Duplex 2205 (1.4462)	Duplex 2205 (1.4462)	Duplex 2205 (1.4462)	300
Superduplex (1.4410)	Superduplex (1.4410)	Superduplex (1.4410)	300
Hastelloy C22 (2.4602)	Hastelloy C22 (2.4602)	Hastelloy C22 (2.4602)	400
Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)	400
Inconel 600 (2.4816)	Inconel 600 (2.4816)	Inconel 600 (2.4816)	400
Inconel 625 (2.4856)	Inconel 625 (2.4856)	Inconel 625 (2.4856)	400
Incoloy 825 (2.4558)	Incoloy 825 (2.4858)	Incoloy 825 (2.4858)	400
Monel 400 (2.4360)	Monel 400 (2.4360)	Monel 400 (2.4360)	400

1) Combination of materials for upper body and wetted parts only possible in connection with form B2 sealing faces and RFSF

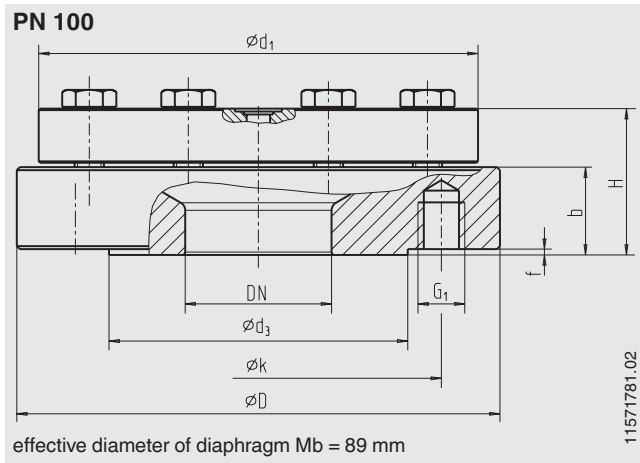
2) Combination with flushing connection not possible, use a flushing ring where applicable (data sheet AC 91.05)

3) Combination with flushing connection only possible in conjunction with stainless steel 1.4404 as lower body material

Further material combinations and process temperature limits on request

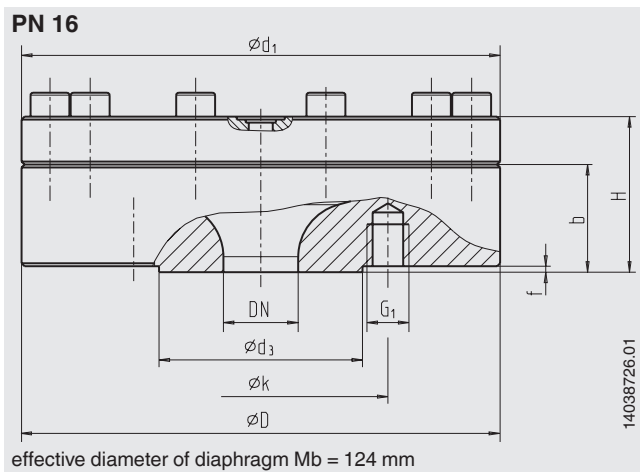
Dimensions in mm

Standard version 1)



1) Dimensions for special materials on request

Option 1)



1) Dimensions for special materials on request

Connection per EN 1092-1

DN in mm	PN in bar	Dimensions in mm			d_3	k	H	b	f	Threads/bores	
		D	Mb	d_1						G_1	Quantity
15	16	160	124	160	45	65	52	36	2	M12	4
	100	150	89	150	45	75	52	32	2	M12	4
20	16	160	124	160	58	75	54	38	2	M12	4
	100	150	89	150	58	90	53	33	2	M16	4
25	16	160	124	160	68	85	52	36	2	M12	4
	100	150	89	150	68	100	52	32	2	M16	4
40	16	160	124	160	88	110	51	35	2	M16	4
	100	170	89	150	88	125	58	38	2	M20	4
50	16	165	124	160	102	125	51	35	2	M16	4
	100	195	89	150	102	145	48	28	2	M24	4

Connection per ASME B 16.5

NPS in inches	Class	Dimensions in mm								Threads/bores	
		D	Mb	d ₁	d ₃	k	H	b	f	G ₁	Quantity
1/2	150	160	124	160	35	60.3	56	40	2	1/2-13UNC	4
	150	150	89	150	34.9	60.3	57	37	2	1/2-13UNC	4
	300	150	89	150	34.9	66.7	55	35	2	1/2-13UNC	4
	600	150	89	150	34.9	66.7	60	40	7	1/2-13UNC	4
3/4	150	160	124	160	43	70	54	38	2	1/2-13UNC	4
	150	150	89	150	42.9	69.9	55	35	2	1/2-13UNC	4
	300	150	89	150	42.9	82.6	54	34	2	5/8-11UNC	4
	600	150	89	150	42.9	82.6	60	40	7	5/8-11UNC	4
1	150	160	124	160	51	79.4	52	36	2	1/2-13UNC	4
	150	150	89	150	50.8	79.4	52	32	2	1/2-13UNC	4
	300	150	89	150	50.8	88.9	52	32	2	5/8-11UNC	4
	600	150	89	150	50.8	88.9	57	37	7	5/8-11UNC	4
1 1/2	150	160	124	160	73	98.4	49	33	2	1/2-13UNC	4
	150	150	89	150	73	98.4	50	30	2	1/2-13UNC	4
	300	155	89	150	73	114.3	56	36	2	3/4-10UNC	4
	600	155	89	150	73	114.3	60	40	7	3/4-10UNC	4
2	150	160	124	160	92	121	50	34	2	5/8-11UNC	4
	150	150	89	150	92.1	120.7	48	28	2	5/8-11UNC	4
	300	165	89	150	92.1	127	48	28	2	5/8-11UNC	8
	600	165	89	150	92.1	127	53	33	7	5/8-11UNC	8

Ordering information

Diaphragm seal:

Diaphragm seal model / Process connection (standard, nominal width, nominal pressure, sealing face) / Materials (upper body, diaphragm, lower body) / Sealing / Retainer parts / Flushing connection / Locking screw on the flushing connection / Connection to the measuring instrument / Level of cleanliness of wetted parts / Design per NACE / Origin of wetted parts / Certificates

Diaphragm seal system:

Diaphragm seal model / Process connection (standard, nominal width, nominal pressure, sealing face) / Materials (upper body, diaphragm, lower body) / Sealing / Retainer parts / Flushing connection / Locking screw on the flushing connection / Pressure measuring instrument model (per data sheet) / Assembly (direct assembly, via cooling element or 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 / Design per NACE / Diaphragm seal for mounting to zone 0 / Mounting bracket

© 2012 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.

