

# Diaphragm seal with flange connection With internal diaphragm, threaded design Model 990.41, large working volume

WIKA data sheet DS 99.32



for further approvals  
see page 5

## Applications

- Aggressive, contaminated or hot media
- Chemical and petrochemical industries
- Oil and gas industry

## Special features

- Flange with internal welded diaphragm
- Wide temperature application range due to large working volume
- When special materials are selected, all wetted parts are made of the selected material
- Integrated flushing connections (optional)



**Diaphragm seal with flange connection,  
model 990.41**

## 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".

The model 990.41 diaphragm seal is ideally suited for applications with small process connections. Due to its design, with an internal diaphragm, accurate measurements are possible even with small flange connections.

By means of optionally available flushing connections, the process side of the flange can be cleaned and flushed as required.

Assembly 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.

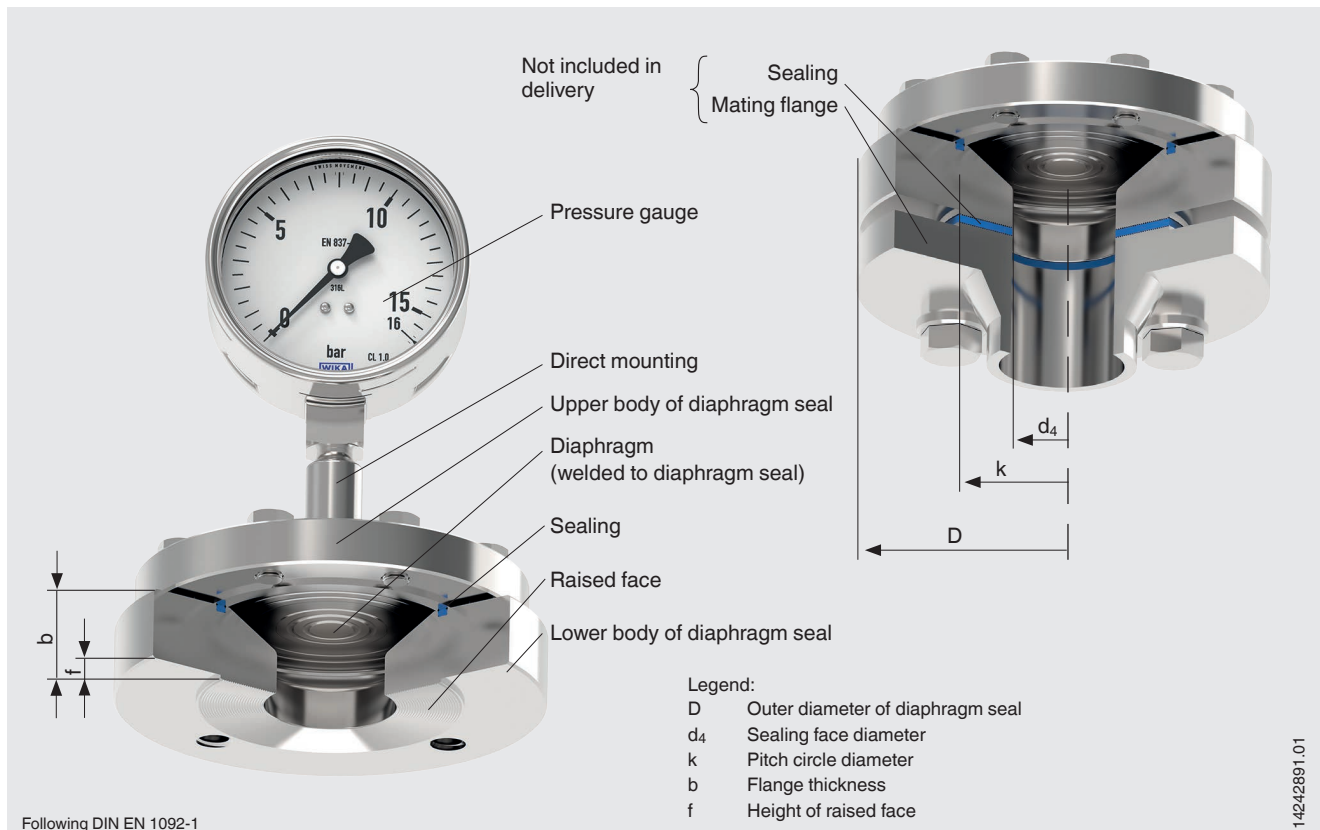
For the material selection WIKA offers a variety of solutions, in which the upper body of the diaphragm seal and the wetted parts can be made of identical or different materials. The wetted parts can, as an alternative, be coated.

## Specifications

Model 990.41	Standard	Option
<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, level D, &lt; 220 mg/m<sup>2</sup> 1)</li> <li>■ Oil and grease free, Level C, &lt; 66 mg/m<sup>2</sup> 1)</li> <li>■ Oil and grease free for oxygen applications, &lt; 66 mg/m<sup>2</sup></li> <li>■ Silicone-free, packed airtight</li> </ul>
<b>Origin of wetted parts</b>	International	EU, CH, USA
<b>Sealing</b>	<ul style="list-style-type: none"> <li>■ FPM (max. 200 °C)</li> <li>■ PTFE (max. 260 °C)</li> </ul>	Statotherm® (max. 400 °C)
<b>Flushing connection</b>	-	<ul style="list-style-type: none"> <li>■ Single flushing connection (G ¼, G ⅛, ¼ NPT, ⅛ NPT)</li> <li>■ Dual flushing connection (G ¼, G ⅛, ¼ NPT, ⅛ NPT)</li> <li>■ Plug screws</li> </ul>
<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>Retainer parts</b>	Stainless steel	-
<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>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) Per ASTM G93-03 and ISO 15001

### Example: Diaphragm seal model 990.41 with mounted pressure gauge



## Process connection, flange

Standard	Flange size	Sealing face	
		Standard	Option
Following DIN EN 1092-1	DN 15	Form B1	Form B2 Form C (tongue) Form D (groove) Form E (spigot with form B1) Form E (spigot with form B2) Form F (recess with form B1) Form F (recess with form B2) Form G (O-ring spigot) Form H (O-ring groove)
	DN 20		
	DN 25		
	DN 40		
	DN 50		
Following ASME B16.5	½"	RF 125 ... 250 AA	RFSF Flat face Small tongue Large tongue Large male face Small male face Small groove Large groove Small female face Large female face RJF groove
	¾"		
	1"		
	1 ½"		
	2"		
	2 ½"		
	2"		
Following JIS	DN 25A	-	RF 125 ... 250 AA
	DN 40A		
	DN 50A		

Further flanges and options on request

## Material combinations

Upper body of diaphragm seal	Wetted parts		Maximum permissible process temperature <sup>2)</sup> in °C [°F]
	Lower body of diaphragm seal <sup>1)</sup>	Diaphragm	
<b>Stainless steel 1.4404 (316L)</b>	Stainless steel 1.4404 (316L)	Stainless steel 1.4404 / 1.4435 (316L), standard version	400 [752]
	Stainless steel 1.4539 (904L)	Stainless steel 1.4539 (904L)	
	Stainless steel 1.4541 (321)	Stainless steel 1.4541 (321)	
	Stainless steel 1.4571 (316Ti)	Stainless steel 1.4571 (316Ti)	
	ECTFE coating	ECTFE coating	150 [302]
	PFA (perfluoroalkoxy) coating, FDA	PFA (perfluoroalkoxy) coating, FDA	260 [500]
	PFA (perfluoroalkoxy) coating, antistatic	PFA (perfluoroalkoxy) coating, antistatic	
	Stainless steel 1.4404 (316L)	Gold plating	400 [752]
	Stainless steel 1.4404 (316L)	Wikaramic® coating	
	Hastelloy C22 (2.4602)	Hastelloy C22 (2.4602)	260 [500]
	Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)	400 [752]
	Inconel 600 (2.4816)	Inconel 600 (2.4816)	
	Inconel 625 (2.4856)	Inconel 625 (2.4856)	
	Incoloy 825 (2.4858)	Incoloy 825 (2.4858)	
	Monel 400 (2.4360)	Monel 400 (2.4360)	
	Nickel 200 (2.4060, 2.4066)	Nickel 200 (2.4060, 2.4066)	
	Titanium class 2 (3.7035)	Titanium class 2 (3.7035)	150 [302]
	Titanium grade 2 (3.7035)	Titanium grade 2 (3.7035)	300 [572]
Titanium grade 7 (3.7235)	Titanium grade 11 (3.7225)		
<b>Stainless steel 1.4435 (316L)</b>	Stainless steel 1.4435 (316L)	Stainless steel 1.4435 (316L)	400 [752]
<b>Stainless steel 1.4539 (904L)</b>	Stainless steel 1.4539 (904L)	Stainless steel 1.4539 (904L)	
<b>Stainless steel 1.4541 (321)</b>	Stainless steel 1.4541 (321)	Stainless steel 1.4541 (321)	
<b>Stainless steel 1.4571 (316Ti)</b>	Stainless steel 1.4571 (316Ti)	Stainless steel 1.4571 (316Ti)	
<b>Duplex 2205 (1.4462)</b>	Duplex 2205 (1.4462)	Duplex 2205 (1.4462)	
<b>Superduplex (1.4410)</b>	Superduplex (1.4410)	Superduplex (1.4410)	400 [752]
<b>Hastelloy C22 (2.4602)</b>	Hastelloy C22 (2.4602)	Hastelloy C22 (2.4602)	
<b>Hastelloy C276 (2.4819)</b>	Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)	
<b>Inconel 600 (2.4816)</b>	Inconel 600 (2.4816)	Inconel 600 (2.4816)	
<b>Inconel 625 (2.4856)</b>	Inconel 625 (2.4856)	Inconel 625 (2.4856)	
<b>Incoloy 825 (2.4558)</b>	Incoloy 825 (2.4858)	Incoloy 825 (2.4858)	
<b>Monel 400 (2.4360)</b>	Monel 400 (2.4360)	Monel 400 (2.4360)	
<b>Nickel 200 (2.4060, 2.4066)</b>	Nickel 200 (2.4060, 2.4066)	Nickel 200 (2.4060, 2.4066)	
<b>Titanium grade 2 (3.7035)</b>	Titanium grade 2 (3.7035)	Titanium grade 2 (3.7035)	
<b>Titanium grade 7 (3.7235)</b>	Titanium grade 7 (3.7235)	Titanium grade 11 (3.7225)	

1) The lower body of the diaphragm seal is optionally available with up to two flushing connections.

2) The maximum permissible process temperature of the diaphragm seal system is limited by the joining method, by the system fill fluid and by the measuring instrument.

Further material combinations for special process temperatures on request


## Other versions

- Per NACE <sup>1)</sup> MR 0175 / ISO 15156, use in H<sub>2</sub>S-containing environments in oil and gas production
- Per NACE <sup>1)</sup> MR 0103 / ISO 17945, metals resistant to sulfide stress cracking
- With pre-volume deflagration flame arrester <sup>2)</sup> for connection to zone 0 (EPL Ga); model 910.21; see data sheet AC 91.02

1) General information about NACE standards; see data sheet IN 00.21

2) Only for diaphragm seal systems with mounted pressure measuring instrument with Ex approval

## Approvals

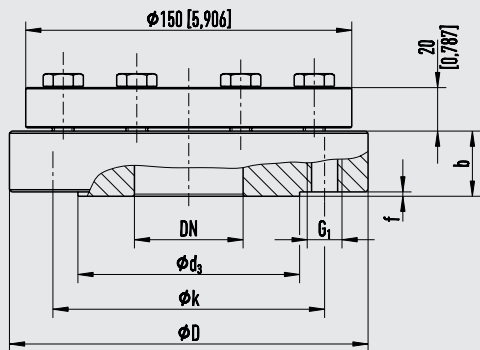
Logo	Description	Country
	<b>EAC (option)</b> Pressure equipment directive	Eurasian Economic Community
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...)	Canada
-	<b>MTSCHS (option)</b> Permission for commissioning	Kazakhstan

## 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)

Approvals and certificates, see website

## Dimensions in mm [in]



### Legend:

Mb	Effective diameter of diaphragm
D	Outer diameter of diaphragm seal
b	Flange thickness
d <sub>3</sub>	Sealing face diameter
f	Height of raised face
k	Pitch circle diameter
G	Thread
x	Number of screws

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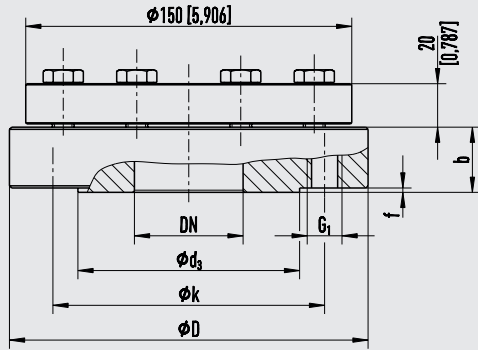
## Flange connection per ASME B 16.5, RF 125 ... 250 AA

DN	Class	Dimensions in mm [in]						G <sub>1</sub>	x
		Mb	D	b	d <sub>3</sub>	f	k		
½"	150	89 [3.504]	150 [5.906]	37 [1.467]	34.9 [1.374]	2 [0.079]	60.3 [2.374]	½"-13 UNC	4
	300	89 [3.504]	150 [5.906]	36 [1.417]	34.9 [1.374]	2 [0.079]	66.7 [2.656]	½"-13 UNC	4
	400/600	89 [3.504]	150 [5.906]	40 [1.575]	34.9 [1.374]	7 [0.276]	66.7 [2.656]	½"-13 UNC	4
¾"	150	89 [3.504]	150 [5.906]	35 [1.378]	42.9 [1.689]	2 [0.079]	69.9 [2.752]	½"-13 UNC	4
	300	89 [3.504]	150 [5.906]	34 [1.339]	42.9 [1.689]	2 [0.079]	82.6 [3.252]	⅝"-11 UNC	4
	400/600	89 [3.504]	150 [5.906]	40 [1.575]	42.9 [1.689]	7 [0.276]	82.6 [3.252]	⅝"-11 UNC	4
1"	150	89 [3.504]	150 [5.906]	32 [1.26]	50.8 [2]	2 [0.079]	79.4 [3.126]	½"-13 UNC	4
	300	89 [3.504]	150 [5.906]	32 [1.26]	50.8 [2]	2 [0.079]	88.9 [3.5]	⅝"-11 UNC	4
	600	89 [3.504]	150 [5.906]	37 [1.467]	50.8 [2]	7 [0.276]	88.9 [3.5]	⅝"-11 UNC	4
1 ½"	150	89 [3.504]	150 [5.906]	30 [1.181]	73 [2.874]	2 [0.079]	98.4 [3.874]	½"-13 UNC	4
	300	89 [3.504]	155 [6.102]	36 [1.417]	73 [2.874]	2 [0.079]	114.3 [4.5]	¾"-10 UNC	4
	400/600	89 [3.504]	155 [6.102]	40 [1.575]	73 [2.874]	7 [0.276]	114.3 [4.5]	¾"-10 UNC	4
2"	150	89 [3.504]	150 [5.906]	28 [1.102]	92.1 [3.626]	2 [0.079]	120.7 [4.752]	⅝"-11 UNC	4
	300	89 [3.504]	165 [6.496] <sup>1)</sup>	28 [1.102]	92.1 [3.626]	2 [0.079]	127 [5]	⅝"-11 UNC	8
	400/600	89 [3.504]	165 [6.496] <sup>1)</sup>	33 [1.299]	92.1 [3.626]	7 [0.276]	127 [5]	⅝"-11 UNC	8

1) For versions with flushing connection (option) the outer diameter D may change

Further dimensions and higher nominal pressures on request

## Dimensions in mm [in]



### Legend:

- Mb Effective diameter of diaphragm
- D Outer diameter of diaphragm seal
- b Flange thickness
- $d_3$  Sealing face diameter
- f Height of raised face
- k Pitch circle diameter
- $G_1$  Thread
- x Number of screws

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### Flange connection following DIN EN 1092-1, form B1

DN	PN in bar	Dimensions in mm [in]						$G_1$	x
		Mb	D	b	$d_3$	f	k		
15	10 ... 40	89 [3.504]	150 [5.906]	34 [1.339]	45 [1.772]	2 [0.079]	65 [2.559]	M12	4
	63 ... 100	89 [3.504]	150 [5.906]	32 [1.26]	45 [1.772]	2 [0.079]	75 [2.953]	M12	4
20	10 ... 40	89 [3.504]	150 [5.906]	33 [1.229]	58 [2.283]	2 [0.079]	75 [2.953]	M12	4
	63 ... 100	89 [3.504]	150 [5.906]	33 [1.299]	58 [2.283]	2 [0.079]	90 [3.543]	M16	4
25	10 ... 40	89 [3.504]	150 [5.906]	32 [1.26]	68 [2.677]	2 [0.079]	85 [3.346]	M12	4
	63 ... 100	89 [3.504]	150 [5.906]	32 [1.26]	68 [2.677]	2 [0.079]	100 [3.937]	M16	4
40	10 ... 40	89 [3.504]	150 [5.906]	32 [1.26]	88 [3.465]	2 [0.079]	110 [4.331]	M16	4
	63 ... 100	89 [3.504]	170 [6.693]	40 [1.575]	88 [3.465]	2 [0.079]	125 [4.921]	M20	4
50	10 ... 40	89 [3.504]	165 [6.496]	35 [1.378]	102 [4.016]	2 [0.079]	125 [4.921]	M16	4
	63	89 [3.504]	180 [7.087]	26 [1.024]	102 [4.016]	2 [0.079]	135 [5.315]	M20	4
	100	89 [3.504]	195 [7.677]	28 [1.102]	102 [4.016]	2 [0.079]	145 [5.709]	M24	4

Further dimensions and higher nominal pressures on request

### Ordering information

Diaphragm seal:

Diaphragm seal model / Process connection (standard, flange size, nominal pressure, sealing face) / Materials (upper body, lower body, sealing face, diaphragm, sealing) / Retainer parts (screws, retainer flange) / Flushing connection / Level of cleanliness of wetted parts / Origin of wetted parts / Design per NACE / Connection to the measuring instrument / Certificates

Diaphragm seal system:

Diaphragm seal model / Pressure measuring instrument model (per data sheet) / Mounting (direct mounting, cooling element, capillary) / Materials (upper body, sealing face, diaphragm) / 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 / Instrument mounting bracket / Process connection (standard, flange size, nominal pressure, sealing face)

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