

# Diaphragm seal with flange connection

## With flush diaphragm

### Model 990.27

WIKA data sheet DS 99.27



for further approvals  
see page 3

#### Applications

- For aggressive, highly viscous, crystallising or hot media
- Process industry
- Machine building and automation

#### Special features

- Flange with a flush welded diaphragm
- Available for all common standards and nominal widths
- When special materials are selected, all wetted parts (diaphragm and sealing face) are made of the selected material
- Robust, all welded design



**Diaphragm seal with flange connection,  
model 990.27**

## 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 990.27 diaphragm seal is available in place of a blind flange for all commonly used standard flanges.

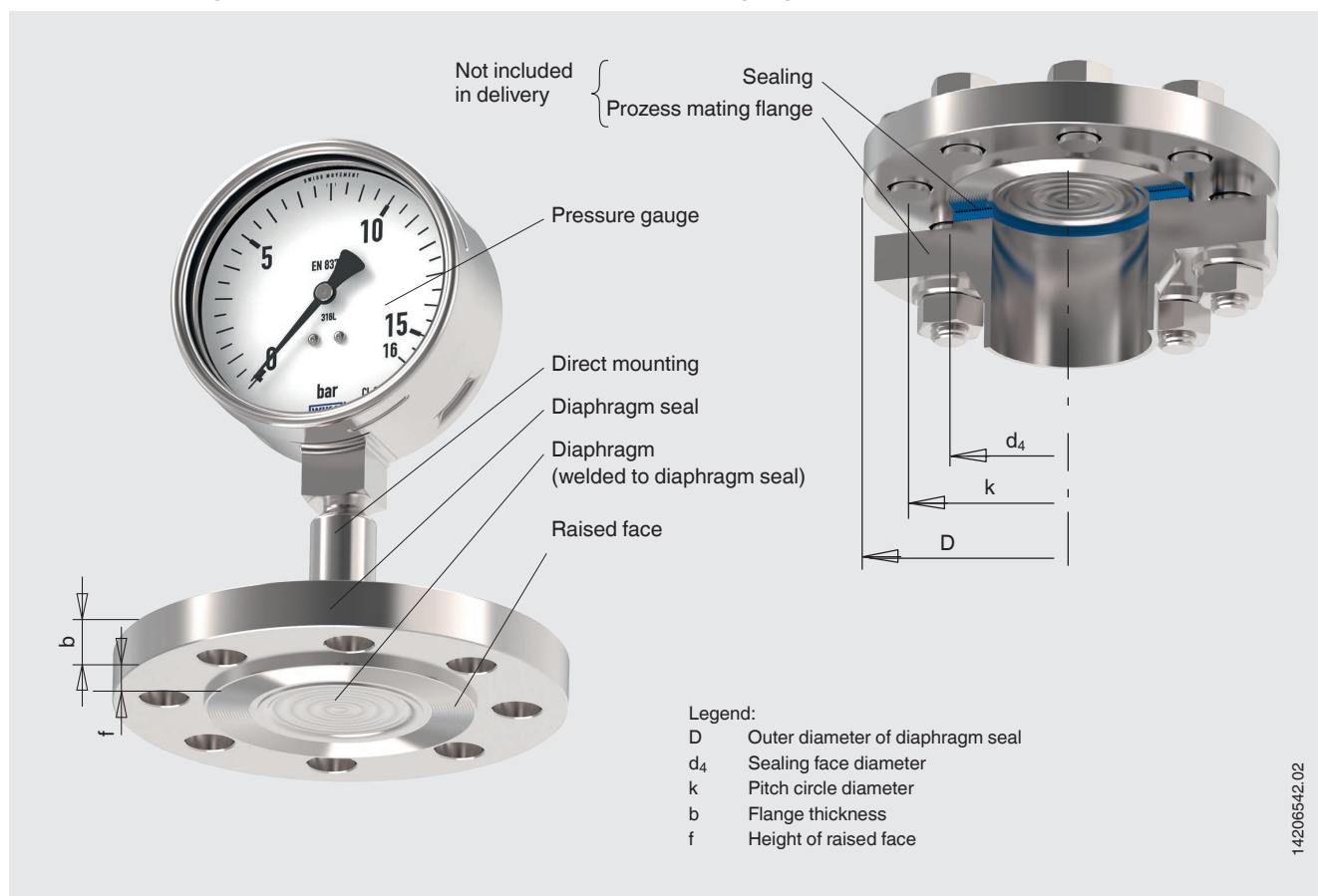
Assembly of the diaphragm seal to the measuring instrument may be made via a direct connection, for high temperatures via a cooling element or via a flexible capillary.

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 diaphragm can, as an alternative, be coated.

## Specifications

Model 990.27	Standard	Option
Nominal pressure and materials	See tables from page 5	
Level of cleanliness of wetted parts	Oil and grease free per ASTM G93-03 level E (WIKA standard) and ISO 15001 (< 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/Öl/m<sup>2</sup>)</li> </ul>
Origin of wetted parts	International	<ul style="list-style-type: none"> <li>■ EU</li> <li>■ CH</li> <li>■ USA</li> </ul>
Connection to the measuring instrument	Axial weld-in connection	Axial weld-in connection with G 1/2, G 1/4, 1/2 NPT or 1/4 NPT (female)
Type of mounting	Direct mounting	<ul style="list-style-type: none"> <li>■ Capillary</li> <li>■ Cooling element</li> </ul>
Flushing ring	-	Stainless steel 316L, for connection DN 40 ... 125 per EN or DN 1 1/2" ... 5" per ASME (see data sheet AC 91.05)
Design per NACE	-	<ul style="list-style-type: none"> <li>■ MR 0175</li> <li>■ MR 0103</li> </ul>
Vacuum service	-	<ul style="list-style-type: none"> <li>■ Basic</li> <li>■ Premium</li> <li>■ Advanced</li> </ul>
Diaphragm seals for mounting to zone 0	-	<ul style="list-style-type: none"> <li>■ With flame arrester</li> <li>■ With flame arrester and PTB certificate</li> </ul>
Instrument mounting bracket (only for capillary option)	-	<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>

### Example: Diaphragm seal model 990.27 with mounted pressure gauge



## Process connection, flange

Standard	Nominal width	Sealing face	
		Standard	Option
Following DIN EN 1092-1	DN 25	Form B1	<ul style="list-style-type: none"> <li>■ Form B2</li> <li>■ Form C (tongue)</li> <li>■ Form D (groove)</li> <li>■ Form E (spigot with form B1)</li> <li>■ Form E (spigot with form B2)</li> <li>■ Form F (recess with form B1)</li> <li>■ Form F (recess with form B2)</li> <li>■ Form G (O-ring spigot)</li> <li>■ Form H (O-ring groove)</li> </ul>
	DN 40		
	DN 50		
	DN 65		
	DN 80		
	DN 100		
	DN 125		
Following ASME B16.5	1"	RF 125 ... 250 AA	<ul style="list-style-type: none"> <li>■ RFSF</li> <li>■ Small tongue</li> <li>■ Small male face</li> <li>■ Small groove</li> <li>■ Small female face</li> <li>■ Large tongue</li> <li>■ Large male face</li> <li>■ Large groove</li> <li>■ Large female face</li> <li>■ RJF groove</li> </ul>
	1 ½"		
	2"		
	2 ½"		
	3"		
	4"		
	5"		
Following GOST 33259	DN 25	Type B	<ul style="list-style-type: none"> <li>■ Type A (flat face)</li> <li>■ Type C (tongue)</li> <li>■ Type D (groove)</li> <li>■ Type E (spigot, male face)</li> <li>■ Type F (recess, female face)</li> <li>■ Type J (O-ring groove)</li> </ul>
	DN 40		
	DN 50		
	DN 65		
	DN 80		
	DN 100		
	DN 125		
Following API 6A	1 1/8"	Ring-joint groove	-
	1 1/16"		
	1 13/16"		
	2 1/16"		
Following JIS B2220	DN 25A	RF 125 ... 250 AA	<ul style="list-style-type: none"> <li>■ FF (full face)</li> <li>■ Male face</li> <li>■ Female face</li> <li>■ Tongue</li> <li>■ Groove</li> </ul>
	DN 40A		
	DN 50A		
	DN 80A		
	DN 100A		

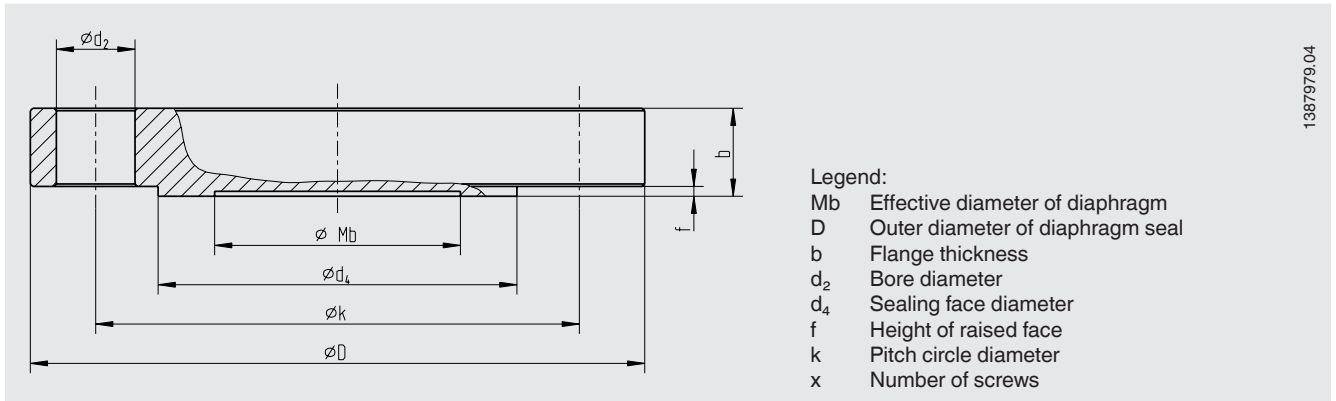
Other flanges on request

## Material combinations

Upper body of diaphragm seal	Wetted parts	Maximum permissible process temperature (°C)
<b>Stainless steel 1.4404 (316L)</b>	Stainless steel 1.4404 / 1.4435 (316L), standard version	400
	Stainless steel 1.4539 (904L)	400
	Stainless steel 1.4541 (321)	400
	Stainless steel 1.4571 (316Ti)	400
	ECTFE coating	150
	PFA coating FDA	260
	PFA coating, antistatic	260
	Gold plating	400
	Wikaramic® coating	400
	Hastelloy C22 (2.4602)	260
	Hastelloy C276 (2.4819)	400
	Inconel 600 (2.4816)	400
	Inconel 625 (2.4856)	400
	Incoloy 825 (2.4858)	400
	Monel 400 (2.4360)	400
	Nickel	260
	Titanium (3.7035)	150
	Titanium (3.7235)	150
	Tantalum	300
	<b>Stainless steel 1.4435 (316L)</b>	Stainless steel 1.4435 (316L)
<b>Stainless steel 1.4539 (904L)</b>	Stainless steel 1.4539 (904L)	400
<b>Stainless steel 1.4541 (321)</b>	Stainless steel 1.4541 (321)	400
<b>Stainless steel 1.4571 (316Ti)</b>	Stainless steel 1.4571 (316Ti)	400
<b>Duplex 2205 (1.4462)</b>	Duplex 2205 (1.4462)	300
<b>Superduplex (1.4410)</b>	Superduplex (1.4410)	300
<b>Hastelloy C22 (2.4602)</b>	Hastelloy C22 (2.4602)	400
<b>Hastelloy C276 (2.4819)</b>	Hastelloy C276 (2.4819)	400
<b>Inconel 600 (2.4816)</b>	Inconel 600 (2.4816)	400
<b>Inconel 625 (2.4856)</b>	Inconel 625 (2.4856)	400
<b>Incoloy 825 (2.4558)</b>	Incoloy 825 (2.4858)	400
<b>Monel 400 (2.4360)</b>	Monel 400 (2.4360)	400
<b>Nickel</b>	Nickel	400
<b>Titanium 3.7035</b>	Titanium 3.7035	400
<b>Titanium 3.7235</b>	Titanium 3.7235	400

Further material combinations for special process temperatures on request

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

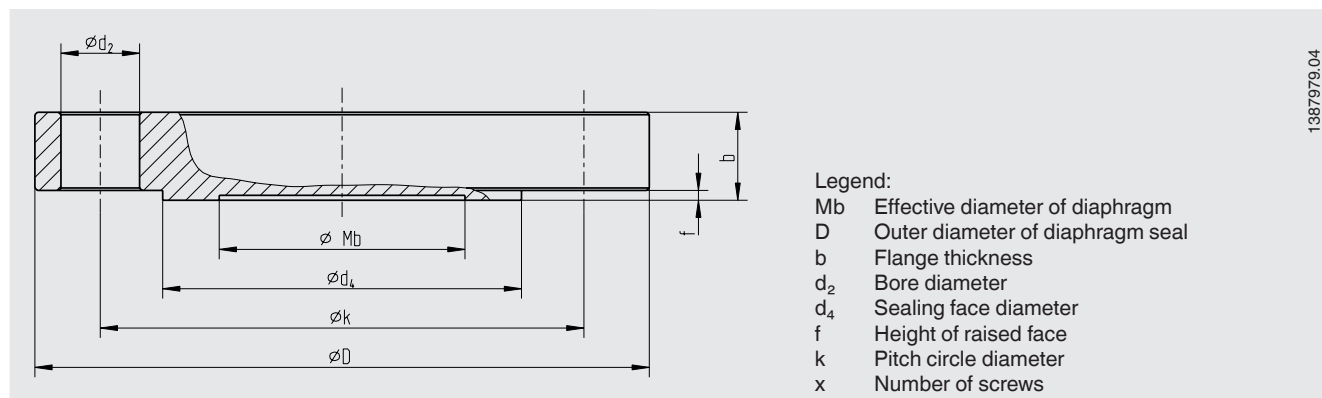


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DN	PN	Dimensions in mm (inch)							x	Weight in kg
		Mb	D	b	d <sub>2</sub>	k	f	d <sub>4</sub>		
25	10/40	32 (1.26)	115 (4.528)	18 (0.709)	14 (0.551)	85 (3.346)	2 (0.079)	68 (2.677)	4	1.5
	63/100	25 (0.984)	140 (0.984)	24 (0.945)	18 (0.709)	100 (3.937)				2.5
40	10/40	45 (1.772)	150 (5.905)	18 (0.709)	18 (0.709)	110 (4.331)	2 (0.079)	88 (3.465)	4	2.6
	63/100		170 (6.693)	26 (1.024)	22 (0.866)	125 (4.921)				4.0
	160		170 (6.693)	28 (1.102)	22 (0.866)	125 (4.921)				4.3
	250		185 (2.283)	34 (1.339)	26 (1.024)	135 (5.315)				6.3
50	10/40	59 (2.323)	165 (6.496)	20 (0.787)	18 (0.709)	125 (4.921)	2 (0.079)	102 (4.016)	4	3.3
	63		180 (7.087)	26 (1.024)	22 (0.866)	135 (5.315)				5.1
	100		195 (7.677)	28 (1.102)	26 (1.024)	145 (5.709)				6.5
	160		195 (7.677)	30 (1.181)	26 (1.024)	145 (5.709)				7.0
	250		200 (7.874)	38 (1.496)	26 (1.024)	150 (5.906)			8	9.3
80	10/16	89 (3.504)	200 (7.874)	20 (0.787)	18 (0.709)	160 (6.299)	2 (0.079)	138 (5.433)	8	4.9
	25/40		200 (7.874)	24 (0.945)	18 (0.709)	160 (6.299)				5.8
	63		215 (8.465)	28 (1.102)	22 (0.866)	170 (6.693)				7.9
	100		230 (9.055)	32 (1.26)	26 (1.024)	180 (7.087)				10.4
	160		230 (9.055)	36 (1.487)	26 (1.024)	180 (7.087)				11.7
	250		255 (10.039)	46 (1.811)	30 (1.181)	200 (7.874)				18.4
100	10/16	89 (3.504)	220 (8.661)	20 (0.787)	18 (0.709)	180 (7.087)	2 (0.079)	158 (6.22)	8	5.9
	25/40		235 (9.252)	24 (0.945)	22 (0.866)	190 (7.480)				8.1
	63		250 (9.842)	30 (1.181)	26 (1.024)	200 (7.874)				11.5
	100		265 (10.433)	36 (1.487)	30 (1.181)	210 (8.268)				15.5
	160		265 (10.433)	40 (1.575)	30 (1.181)	210 (8.268)				17.3
	250		300 (11.811)	54 (2.126)	33 (1.299)	235 (9.252)				29.9
125	10/16	124 (4.882)	250 (9.842)	22 (0.866)	18 (0.709)	210 (8.268)	2 (0.079)	188 (7.402)	8	8.4
	25/40		270 (10.63)	26 (1.024)	26 (1.024)	220 (8.661)				11.6
	63		295 (11.614)	34 (1.339)	30 (1.181)	240 (9.449)				16.5
	100		315 (12.412)	40 (1.575)	33 (1.299)	250 (9.842)				24.4
	160		315 (12.412)	44 (1.732)	33 (1.299)	250 (9.842)				26.9
	250		340 (13.386)	60 (2.342)	33 (1.299)	275 (10.827)				12

Further dimensions and higher nominal pressures on request

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

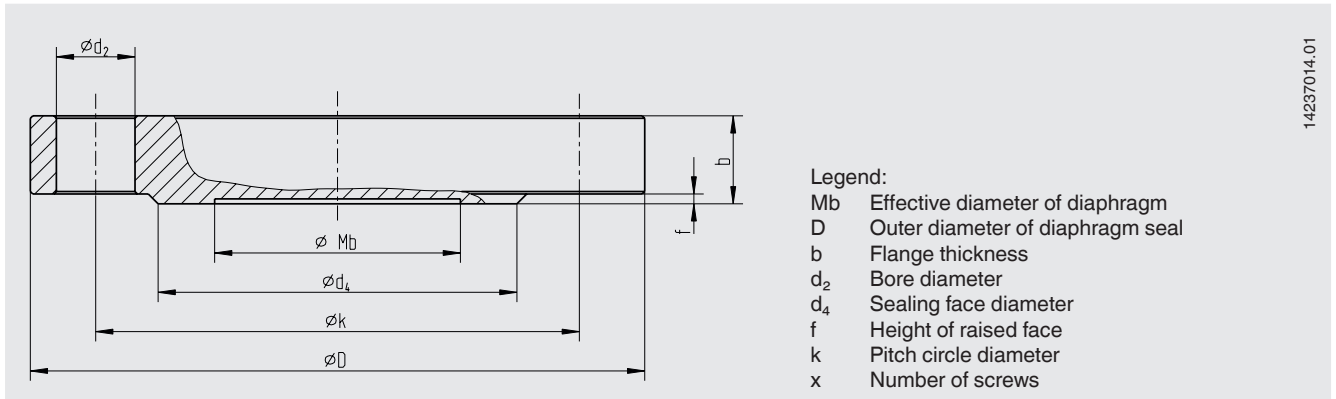


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DN	Class	Dimensions in mm (inch)							x	Weight in kg
		Mb	D	b	d <sub>2</sub>	k	f	d <sub>4</sub>		
1"	150	32 (1.26)	110 (4.331)	14.7 (0.579)	16 (0.63)	79.4 (3.126)	2 (0.079)	51 (2.008)	4	1.4
	300		125 (4.921)	17.9 (0.705)	19 (0.748)	88.9 (3.5)				1.7
1 1/2"	150	45 (1.772)	125 (4.921)	17.9 (0.705)	16 (0.63)	98.4 (3.874)	2 (0.079)	73 (2.874)	4	1.6
	300		155 (6.102)	21.1 (0.831)	22 (0.866)	114.3 (4.5)				2.5
	600		155 (6.102)	29.3 (1.154)	22 (0.866)	114.3 (4.5)	7 (0.276)			3.3
	1,500		180 (7.087)	38.8 (1.528)	29 (1.142)	123.8 (4.874)				5.9
	2,500		205 (8.071)	51.5 (2.078)	32 (1.26)	146 (5.748)				10.4
2"	150	59 (2.323)	150 (5.905)	19.5 (0.768)	19 (0.748)	120.7 (4.752)	2 (0.079)	92 (3.622)	4	2.7
	300		165 (6.496)	22.7 (0.894)	19 (0.748)	127 (5)				8
	600		165 (6.496)	32.4 (1.276)	19 (0.748)	127 (5)	7 (0.276)		5.7	
	1,500		215 (8.465)	45.1 (1.776)	26 (1.024)	165.1 (6.5)			13.2	
	2,500		235 (9.252)	57.9 (2.28)	29 (1.142)	171.4 (6.748)			19.8	
3"	150	89 (3.504)	190 (7.482)	24.3 (0.957)	19 (0.748)	152.4 (6)	2 (0.079)	127 (5)	4	5.3
	300		210 (8.268)	29 (1.142)	22 (0.866)	168.3 (6.626)				8
	600		210 (8.268)	38.8 (1.528)	22 (0.866)	168.3 (6.626)	7 (0.276)		11	
	900		240 (9.449)	45.1 (1.776)	26 (1.024)	190.5 (7.7)			16.7	
	1,500		265 (10.433)	54.7 (1.799)	32 (1.26)	203.2 (8)			24.5	
	2,500		305 (12.007)	73.7 (2.902)	35 (1.378)	228.6 (5.063)			42.7	
4"	150	89 (3.504)	230 (9.055)	24.3 (0.957)	19 (0.748)	190.5 (7.5)	2 (0.079)	158 (6.22)	8	7.7
	300		255 (10.039)	32.2 (1.268)	22 (0.866)	200 (7.874)				12.7
	400		255 (10.039)	42 (1.654)	26 (1.024)	200 (7.874)	7 (0.276)			17.4
	600		275 (10.826)	45.1 (1.776)	26 (1.024)	215.9 (8.5)				21.5
	900		290 (11.417)	51.5 (2.028)	32 (1.26)	235 (9.252)				27.7
	1,500		310 (12.205)	61 (2.402)	35 (1.378)	241.3 (9.5)				37
	2,500		355 (13.976)	83.2 (3.276)	42 (1.654)	273 (10.748)				65.7

Further dimensions and higher nominal pressures on request

## Flange connection per GOST 33259, type B

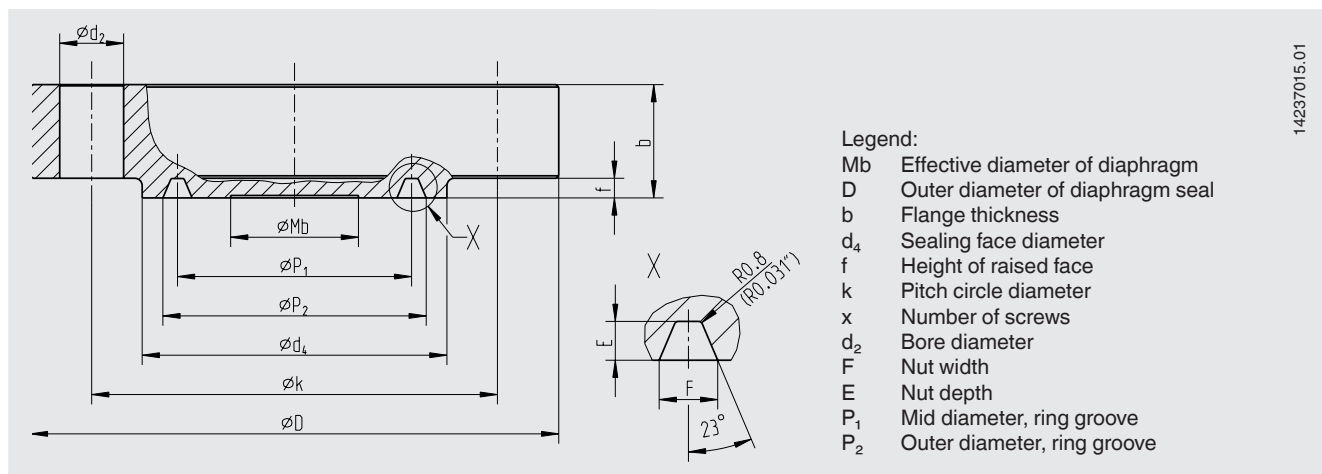


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DN	PN	Dimensions in mm (inch)							x	Weight in kg			
		Mb	D	b	$d_2$	k	f	$d_4$					
50	10/16	59 (2.323)	160 (6.3)	16 (0.63)	18 (0.709)	125 (4.921)	3 (0.118)	102 (4.016)	4	2.4			
	25/40			20 (0.787)						3			
	63			26 (1.024)						22 (0.866)	135 (5.315)	4.5	
	100			28 (1.102)						26 (1.024)	145 (5.709)	5.6	
	160			30 (1.181)						160 (6.299)	6.4		
	200			40 (1.575)						8	9.4		
80	10	89 (3.504)	195 (7.677)	18 (0.709)	18 (0.709)	160 (6.299)	3 (0.118)	133 (5.236)	4	4			
	16			20 (0.787)						4.5			
	25			22 (0.866)						8	4.8		
	40			24 (0.945)							5.2		
	63			210 (7.677)					30 (1.181)	22 (0.866)	170 (6.693)	7.4	
	100			230 (9.055)					34 (1.339)	26 (1.024)	180 (7.087)	9.8	
	160			36 (1.417)					10.4				
	200			290 (11.417)					54 (2.126)	33 (1.299)	230 (9.055)	24.7	
100	10/16	89 (3.504)	215 (8.465)	20 (0.787)	18 (0.709)	180 (7.087)	3 (0.118)	158 (6.22)	8	5.3			
	25			24 (0.945)						22 (0.866)	190 (7.48)	7.1	
	40			26 (1.024)						7.8			
	63			250 (9.842)						32 (1.26)	26 (1.024)	200 (7.874)	11.1
	100			265 (10.433)						38 (1.496)	30 (1.181)	210 (8.268)	14.5
	160			40 (1.575)						15.3			
	200			360 (14.173)						66 (2.598)	39 (1.535)	292 (11.496)	47.2
125	10/16	89 (3.504)	245 (9.646)	22 (0.866)	18 (0.709)	210 (8.268)	3 (0.118)	184 (7.244)	8	7.7			
	25			270 (10.63)						26 (1.024)	26 (1.024)	220 (8.661)	10.6
	40			28 (1.102)						11.4			
	63			295 (11.614)						36 (1.417)	30 (1.181)	240 (9.449)	17.4
	100			310 (12.205)						42 (1.654)	33 (1.299)	250 (9.842)	22.3
	160			310 (12.205)						44 (1.732)	23.4		
	200			385 (15.157)						76 (2.992)	39 (1.535)	318 (12.52)	63.2

Further dimensions and higher nominal pressures on request

## Flange connection per API 6A, ring-joint groove



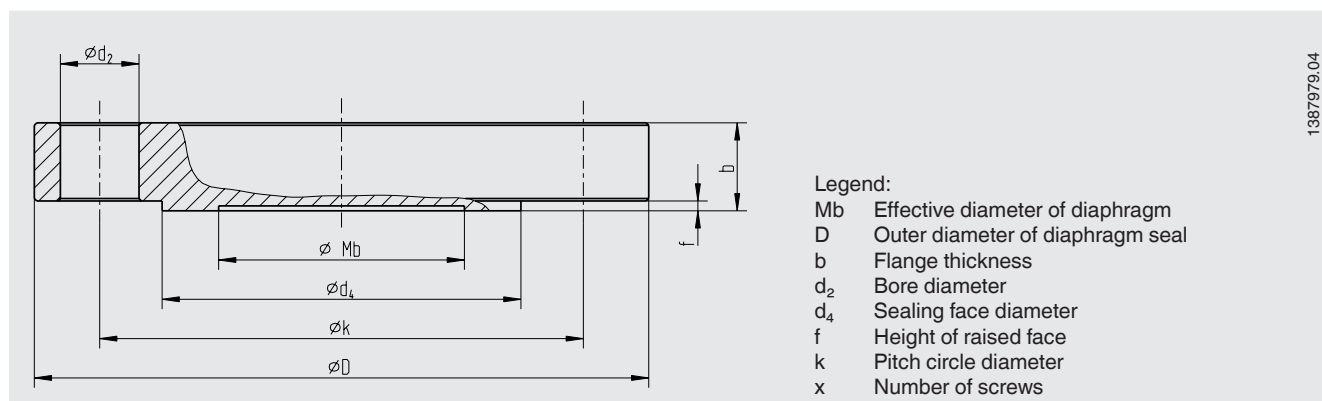
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DN	PN	Dimensions in mm (inch)						x	Nut dimensions in mm (inch)					Weight in kg
		Mb	D	d <sub>4</sub>	f	b	k		d <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	E	F	
1 13/16"	10,000	40 (1.575)	185 (7.283)	105 (4.134)	4 (0.157)	42.1 (1.657)	146.1 (5.752)	8	23 (0.906)	---	77.77 (3.062)	5.56 (0.219)	11.84 (0.466)	7.7
	15,000		210 (8.268)	106 (4.173)		45.3 (1.783)	160.3 (6.311)		26 (1.024)					10.5
	20,000		255 (10.039)	117 (4.606)		63.5 (2.5)	203.2 (8)		29 (1.142)					
2 1/16"	2,000	52 (2.047)	165 (6.496)	108 (4.252)	8 (0.315)	33.4 (1.315)	127 (5)		20 (0.787)	82.55 (3.25)	---	7.9 (0.311)	11.91 (0.469)	4.6
	3,000/ 5,000		215 (8.465)	124 (4.882)		46.1 (1.815)	165.1 (6.5)		26 (1.024)	95.25 (3.75)				10.7
	10,000		200 (7.874)	111 (4.370)	4 (0.157)	44.1 (1.736)	158.8 (6.252)		23 (0.906)	---	86.23 (3.395)	5.95 (0.234)	12.65 (0.498)	9.5
	15,000		220 (8.661)	114 (4.488)		50.8 (2)	174.6 (6.874)		26 (1.024)					13.2
	20,000		285 (11.22)	132 (5.197)		71.5 (2.815)	230.2 (9.063)		32 (1.26)					31.6
2 9/16"	2,000	59 (2.323)	190 (7.48)	127 (5)	8 (0.315)	36.6 (1.441)	149.2 (5.874)		23 (0.906)	101.6 (4)	---	7.9 (3.11)	11.91 (0.469)	6.7
	3,000/ 5,000		245 (9.656)	137 (5.394)		49.3 (1.941)	190.5 (7.5)		29 (1.142)	107.95 (4.25)				15.0
	10,000		230 (9.055)	132 (5.197)	4 (0.157)	51.2 (2.016)	184.2 (7.252)		26 (1.024)	---	102.77 (4.046)	6.75 (0.266)	14.07 (0.579)	14.7
	15,000		255 (10.039)	133 (5.236)		57.2 (2.055)	200 (7.874)		29 (1.142)					20.1
	20,000		325 (12.795)	151 (5.945)		79.4 (3.126)	261.9 (10.311)		35 (1.378)					46.2
3 1/8"	2,000	89 (3.504)	210 (8.268)	146 (5.748)	7.9 (0.311)	39.7 (1.563)	168.3 (6.626)		23 (0.906)	123.83 (4.875)	---	7.9 (0.311)	11.91 (0.469)	9.2
	3,000		240 (9.449)	156 (6.142)	8 (0.315)	46.1 (1.815)	190.5 (7.5)		26 (1.024)					13.9
	5,000		265 (10.433)	168 (6.614)	7.9 (0.311)	55.6 (2.189)	203.2 (8)		32 (1.26)	136.53 (5.375)				20.2

Further dimensions and higher nominal pressures on request



## Flange connection per JIS B 2220, RF 125 ... 250 AA




1387979.04

DN	PN	Dimensions in mm (inch)							x	Weight in kg				
		Mb	D	b	d <sub>2</sub>	k	f	d <sub>4</sub>						
25A	5K	32 (1.26)	95 (3.74)	10 (0.394)	12 (0.472)	75 (2.953)	1 (0.039)	59 (2.323)	4	0.7				
	10K		125 (4.921)	14 (0.551)							19 (0.748)	90 (3.543)	67 (2.638)	
	16K													
	20K			16 (0.63)										
	30K		130 (5.118)	20 (0.787)		95 (3.740)	70 (2.756)							
	40K	25 (0.984)		22 (0.866)										
	63K		140 (5.512)	27 (1.063)	23 (0.906)	100 (3.967)								
50A	5K	59 (2.323)	130 (5.118)	14 (0.551)	15 (0.591)	105 (4.134)	2 (0.079)	85 (3.346)	8	1.5				
	10K		155 (6.102)	16 (0.63)							19 (0.748)	120 (4.724)	96 (3.78)	
	16K													
	20K			18 (0.709)										
	30K			165 (6.496)							22 (0.866)		130 (5.118)	105 (4.134)
	40K										26 (1.024)			
	63K			185 (7.83)							34 (1.339)	23 (0.906)	145 (5.709)	
80A	5K	89 (3.504)	180 (7.087)	14 (0.551)	19 (0.748)	150 (5.905)	160 (6.299)	121 (4.764)	8	2.7				
	10K		185 (7.83)	18 (0.709)								126 (4.961)		
	16K		200 (7.874)	20 (0.787)							23 (0.906)	132 (5.197)		
	20K			22 (0.866)										
	30K			210 (8.268)							28 (1.102)		140 (5.512)	
	40K										32 (1.26)		170 (6.693)	
	63K			230 (9.055)							40 (1.575)	25 (0.984)	185 (7.83)	
100A	5K		200 (7.874)	16 (0.63)	19 (0.748)	165 (6.496)	175 (6.89)	141 (5.551)	8	3.7				
	10K		210 (8.268)	18 (0.709)								151 (5.945)		
	16K		225 (8.858)	22 (0.866)							23 (0.906)	185 (7.83)	160 (6.299)	
	20K			24 (0.945))										
	30K			240 (9.449)							32 (1.26)	25 (0.984)	195 (7.677)	
	40K			250 (9.852)							36 (1.417)		205 (8.071)	165 (6.496)
	63K			270 (10.63)							44 (1.732)	27 (1.063)	220 (8.661)	

Further dimensions and higher nominal pressures on request

## 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

## Ordering information

Diaphragm seal:

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

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, nominal width, nominal pressure, sealing face) / Flushing ring

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