

Diaphragm seal with rotatable flange connection

With large working volume

Model 990.68

WIKA data sheet DS 99.68

Applications

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

Special features

- Flange with internal welded diaphragm
- Suitable for low and high temperature applications due to largest working volume for each connection size
- Wide range of special materials and sealing faces available to meet industry standards
- With integrated flushing connections (selectable)



Diaphragm seal with rotatable flange connection, model 990.68

Description

Diaphragm seals are used to protect pressure measuring instruments in demanding applications under difficult conditions. These diaphragm seal systems, consisting of a process transmitter, pressure sensor, pressure gauge or pressure switch with diaphragm seal, can be combined individually for each customer application. For this, a wide range of different designs, process connections, mounting types and wetted materials are available.

Diaphragm seal models with flange connections are available with flush or internal diaphragms, in tubular design or as in-line diaphragm seals. The variants mentioned are also available in a cell-type design.

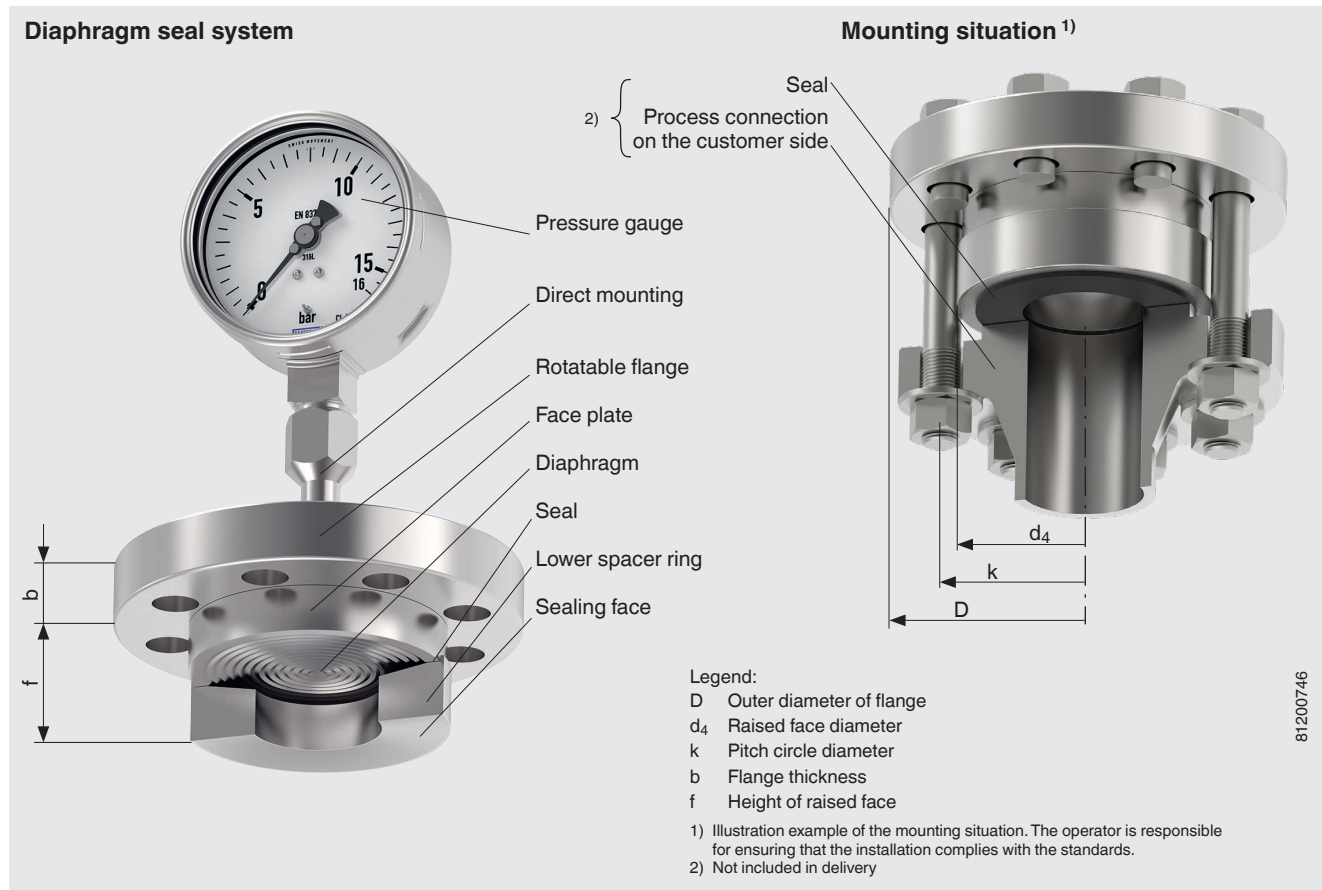
The model 990.68 diaphragm seal with rotatable flange connection consists of non-wetted parts such as the rotatable flange and the face plate. The wetted parts are the seal, the lower spacer ring and the diaphragm. The rotatable flange design enables easy installation during commissioning.

The model 990.68 is equipped with an internal diaphragm that ensures maximum working volume for challenging temperature and pressure applications.

Through the high number of possible combinations and aided by the individual checking of the operating conditions, it is ensured that the ideal customer solution for a diaphragm seal system can be found with the model 990.68.

Installation example

Model 990.68 with directly mounted pressure gauge



Diaphragm seal system

Diaphragm seal systems are mounted to existing connections, which are welded to a pipeline, a process reactor or a tank. A diaphragm made of the appropriate material separates the medium from the measuring instrument. The internal space between the diaphragm and the measuring instrument is completely filled with a system fill fluid.

Measuring element

The pressure of the medium is transferred via the elastic diaphragm to the system fill fluid and then on to the measuring instrument. A diaphragm seal and its components are perfectly matched to each other to ensure a reliable measurement.

Mounting type

Mounting of the diaphragm seal to the measuring instruments may be made via direct mounting, for high temperatures via a heat sink or via a flexible capillary.

Direct mounting via axial connection adapter (example)



Capillary (example)



Heat sink (examples)



Technical information

Data sheet number	Title
IN 00.06	Diaphragm seals and diaphragm seal systems, application – functionality – design
IN 00.25	Diaphragm seal systems for vacuum processes
IN 00.21	General information about NACE standards for sour gas applications
IN 00.41	Specifications of oil- and grease-free instruments

→ See download on the WIKA website

Specifications

Basic information for diaphragm seal systems	
Version	Diaphragm seal with rotatable flange connection, with large working volume
Other versions	■ Per NACE ¹⁾ MR0175 / ISO 15156, use in H₂S-containing environments in oil and gas production ■ Per NACE ¹⁾ MR0103 / ISO 17945, metals resistant to hydrogen sulphide stress cracking ■ With pre-volume deflagration flame arrester ²⁾ for mounting to zone 0 (EPL Ga); model 910.21; see data sheet AC 91.02
Pressure range	The maximum permissible operating pressure must be determined individually for each diaphragm seal system. It is dependent on the operating temperature, the process connection, the joining method, the system fill fluid and the mounted measuring instrument.
Connection to the instrument	■ Axial connection adapter for weld seam ■ Suitable connection adapter to the instrument (e.g. G ½, G ¼, ½ NPT or ¼ NPT)
Mounting type ³⁾	■ Direct mounting ■ Capillary ■ Heat sink

1) General information about NACE standards; see technical information IN 00.21

2) Only for instruments with Ex approval

3) For possible mounting type, see page 2

Process connection	
Standard ¹⁾	■ DIN EN 1092-1 ■ ASME B16.5-2017 ■ JIS B2220
Size	
DIN EN 1092-1	■ DN 25 ■ DN 40 ■ DN 50 ■ DN 80 ■ DN 100
ASME B16.5-2017	■ 1" ■ 1 ½" ■ 2" ■ 3" ■ 4"
JIS B2220	■ DN 25A ■ DN 50A ■ DN 80A ■ DN 100A
Sealing face	
DIN EN 1092-1	■ 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)

Process connection		
ASME B16.5-2017	■ RF 125 ... 250 AA ■ RFSF ■ Flat face ■ Small tongue ■ Small male face ■ Small groove ■ Small female face ■ Large tongue ■ Large male face ■ Large groove ■ Large female face ■ RJF groove	
JIS B2220	RF 125 ... 250 AA	
Wetted parts		
Seal	■ FKM ■ PTFE ■ Graphite	
Diaphragm, lower spacer ring	→ See tables below for material selection	
Origin of wetted parts	■ International ■ Exclusively from EU, CH, GB, US, CA	
Level of cleanliness of wetted parts ²⁾	■ Oil- and grease-free per WIKA specification (< 1,000 mg/m²) ■ Oil- and grease-free per ASTM G93-03 level D (< 220 mg/m²) ■ Oil- and grease-free per ASTM G93-03 level C (< 66 mg/m²)	

1) The respective standard is met for the connection dimensions of the sealing geometry; other dimensions, e.g. bores or flange thicknesses, may vary slightly.
2) Specifications of oil- and grease-free instruments; see technical information IN 00.41

→ Other process connections on request

Material combination		Maximum permissible temperature ¹⁾ in °C [°F]
Rotatable flange	Face plate	
■ Stainless steel 316L (1.4404) ■ Hastelloy C276 (2.4819) ■ Carbon steel 1.0453 (UNS G10180), nickel-plated	Stainless steel 316L (1.4404)	400 [752]
	Hastelloy C276 (2.4819) ^{2) 3)}	400 [752]
	Inconel 600 (2.4816) ²⁾	400 [752]
	Inconel 625 (2.4856) ²⁾	400 [752]
	Incoloy 825 (2.4858) ²⁾	400 [752]
	Monel 400 (2.4360) ²⁾	400 [752]
	Nickel 200 (2.4066) ²⁾	260 [500]
	Titanium grade 2 (3.7035) ²⁾	300 [572]

1) The maximum permissible operating temperature of the diaphragm seal system is limited by the joining method, the system fill fluid and the measuring instrument.
2) This material combination is only possible with form B2 and RFSF sealing faces. Since the parts don't allow any machining, the surface roughness Ra is ≤ 0.5 µm.
3) This material combination is additionally possible with form B1 and RF 125 ... 250 AA sealing faces for DN 50, DN 80 and also 2" and 3".

Material		Maximum permissible temperature ¹⁾ in °C [°F]
Diaphragm	Lower spacer ring	
Stainless steel 316L (1.4404)	Stainless steel 316L (1.4404)	400 [752]
Superduplex 2507 (1.4410)	Superduplex 2507 (1.4410)	250 [482]
Hastelloy C276 (2.4819)	Hastelloy C276 (2.4819)	400 [752]
Inconel 600 (2.4816)	Inconel 600 (2.4816)	400 [752]
Inconel 625 (2.4856)	Inconel 625 (2.4856)	400 [752]
Incoloy 825 (2.4558)	Incoloy 825 (2.4558)	400 [752]
Monel 400 (2.4360)	Monel 400 (2.4360)	400 [752]
Nickel 200 (2.4066)	Nickel 200 (2.4066)	300 [572]
Tantalum	■ Stainless steel 316L (1.4404) ■ Hastelloy C276 (2.4819)	300 [572]
Titanium grade 2 (3.7035)	Titanium grade 2 (3.7035)	300 [572]

1) The maximum permissible operating temperature must be determined individually for each diaphragm seal system. It is dependent on the operating pressure, the process connection, the joining method, the system fill fluid and the mounted measuring instrument.

Material of coating ¹⁾	Maximum permissible temperature ²⁾ in °C [°F]
Wetted parts	
PFA (perfluoroalkoxy), anti-static	260 [500]
Gold	400 [752]

1) The coated basic material is from stainless steel 316L (1.4404)

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

→ Further materials for special process temperatures on request.

Approvals

Logo	Description	Country
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

Manufacturer's information and certificates (option)

Logo	Description
	SIL EXIDA report with SFF values from FMEDA analysis for functional safety assessment in accordance with IEC 61508

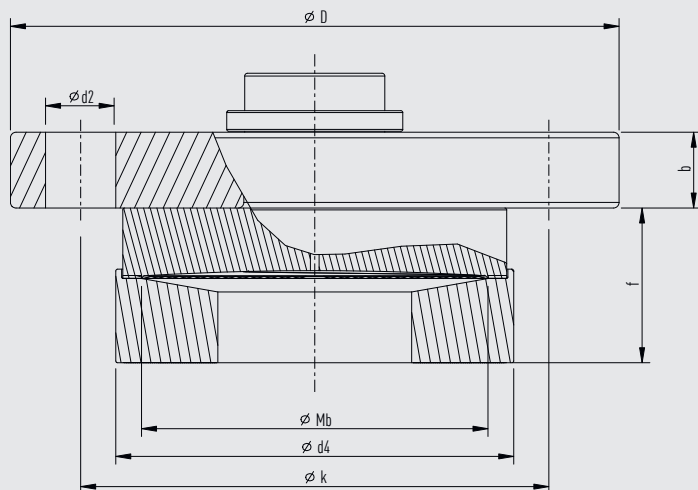
Certificates (option)

Certificates	
Certificates	■ 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 metal parts, indication accuracy for diaphragm seal systems)

→ For approvals and certificates, see website

Dimensions in mm [in]

Sealing geometry per DIN EN 1092-1, form B



Legend:

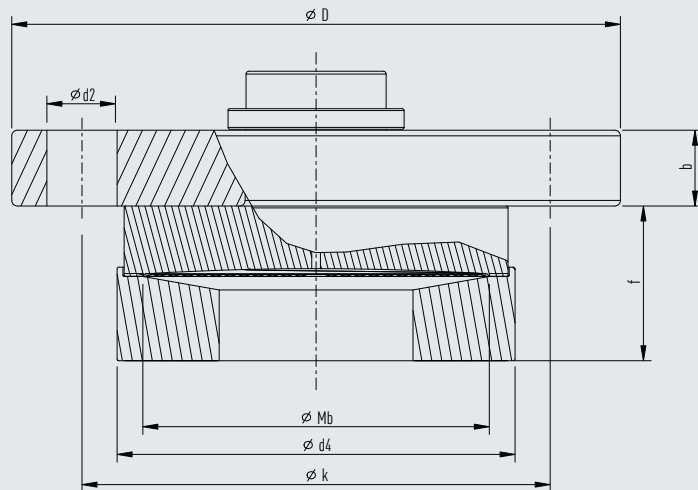
- Mb Effective diameter of diaphragm
- D Outer diameter of diaphragm seal
- b Flange thickness
- d₂ Bore diameter
- d₄ Raised face diameter
- f Height of raised face
- k Pitch circle diameter
- x Number of bores

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DN	PN	Dimensions in mm [in]							x	Weight in kg [lb]
		Mb	D	b	d ₂	k	f	d ₄		
25	63/100	50.8 [2]	115.0 [4.53]	16.0 [0.63]	14.0 [0.55]	85 [3.35]	41.9 [1.65]	68.1 [2.68]	4	3.5 [7.7]
	160	62.9 [2.48]	140.0 [5.51]	22 [0.87]	18.0 [0.71]	100 [3.94]	41.9 [1.65]	76.2 [3]	4	4.0 [8.8]
40	10/40	62.9 [2.48]	150.1 [5.91]	15 [0.59]	18.0 [0.71]	110 [4.33]	41.9 [1.65]	88 [3.46]	4	3.8 [8.4]
	63/100	62.9 [2.48]	170.0 [6.69]	24 [0.95]	22 [0.87]	125 [4.92]	41.9 [1.65]	88 [3.46]	4	5.5 [12.2]
	160	62.9 [2.48]	170.0 [6.69]	26.0 [1.02]	22 [0.87]	125 [4.92]	41.9 [1.65]	88 [3.46]	4	5.9 [13]
	250	62.9 [2.48]	185.0 [6.69]	32.0 [1.25]	26 [1.1]	135 [5.32]	41.9 [1.65]	88 [3.46]	4	8.3 [18.3]
50	10/40	62.9 [2.48]	165.0 [6.5]	18.0 [0.71]	18.0 [0.71]	125 [4.92]	41.9 [1.65]	102.0 [4.02]	4	4.5 [9.9]
	63	94.0 [3.7]	180.0 [7.09]	24.0 [0.95]	22 [0.87]	135 [5.32]	41.9 [1.65]	106.7 [4.2]	4	7.8 [16.7]
	100	94.0 [3.7]	195.0 [7.68]	26.0 [1.02]	26.0 [1.02]	145 [5.71]	41.9 [1.65]	106.7 [4.2]	4	9.3 [20.5]
	160	94.0 [3.7]	195.0 [7.68]	28.0 [1.1]	26.0 [1.02]	145 [5.71]	41.9 [1.65]	106.7 [4.2]	4	9.9 [21.8]
	250	94.0 [3.7]	200.0 [7.87]	36.0 [1.49]	26.0 [1.02]	150 [5.91]	41.9 [1.65]	106.7 [4.2]	8	12.7 [27.9]
80	10/16	94.0 [3.7]	200.0 [7.87]	18.0 [0.71]	18.0 [0.71]	160 [6.3]	41.9 [1.65]	138.0 [5.43]	8	7.4 [16.3]
	25/40	94.0 [3.7]	200.0 [7.87]	20.0 [0.79]	18.0 [0.71]	160 [6.3]	41.9 [1.65]	138.0 [5.43]	8	7.9 [17.4]
	63	94.0 [3.7]	215.0 [8.47]	26.0 [1.02]	22 [0.87]	170 [6.69]	41.9 [1.65]	138.0 [5.43]	8	10.4 [22.9]
	100	94.0 [3.7]	230 [9.06]	30.0 [1.18]	26.0 [1.02]	180 [7.09]	41.9 [1.65]	138.0 [5.43]	8	13.4 [29.5]
	160	94.0 [3.7]	230 [9.06]	34.0 [1.34]	26.0 [1.02]	180 [7.09]	41.9 [1.65]	138.0 [5.43]	8	15.0 [33]
100	10/16	94.0 [3.7]	220 [8.66]	18.0 [0.71]	18.0 [0.71]	180 [7.09]	41.9 [1.65]	158.0 [6.22]	8	8.4 [18.6]
	25/40	94.0 [3.7]	235 [9.25]	22.0 [0.87]	22.0 [0.87]	190 [7.48]	41.9 [1.65]	162.0 [6.38]	8	11.1 [24.5]
	100	94.0 [3.7]	250 [9.84]	28.0 [1.1]	26 [1.02]	200 [7.87]	41.9 [1.65]	162.0 [6.38]	8	20 [44]

→ Further dimensions and higher nominal pressures on request

Sealing geometry per ASME B16.5-2017, RF



Legend:

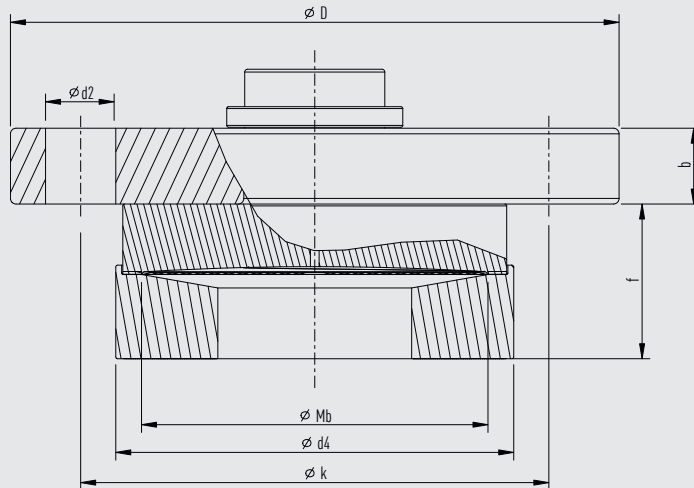
Mb	Effective diameter of diaphragm
D	Outer diameter of diaphragm seal
b	Flange thickness
d ₂	Bore diameter
d ₄	Raised face diameter
f	Height of raised face
k	Pitch circle diameter
x	Number of bores

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DN	Class	Dimensions in mm [in]							x	Weight in kg [lb]
		Mb	D	b	d ₂	k	f	d ₄		
1"	600	50.8 [2]	124 [4.88]	17.5 [0.69]	19.1 [0.75]	114 [4.5]	41.9 [1.65]	65.0 [2.56]	4	3.8 [8.3]
	900/1,500	62.9 [2.48]	149.4 [5.88]	28.4 [1.12]	25.4 [1]	101.6 [4]	41.9 [1.65]	76.2 [3]	4	5.6 [12.4]
1 ½"	150	62.9 [2.48]	127 [5]	16 [0.63]	15.7 [0.62]	98.6 [3.88]	41.9 [1.65]	82.6 [3.25]	4	2.6 [5.8]
	300	62.9 [2.48]	155.4 [6.12]	20.6 [0.81]	22.4 [0.88]	114.3 [4.5]	41.9 [1.65]	82.6 [3.25]	4	3.7 [8.2]
	600	62.9 [2.48]	155.6 [6.13]	22.4 [0.88]	22.4 [0.88]	114.3 [4.5]	41.9 [1.65]	82.6 [3.25]	4	4.62 [10.2]
	900/1,500	62.9 [2.48]	158.8 [6.25]	31.6 [1.25]	28.5 [1.12]	124.0 [4.88]	41.9 [1.65]	82.6 [3.25]	4	7.8 [17.2]
	2,500	62.9 [2.48]	205.0 [8]	44.5 [1.75]	31.6 [1.25]	146.0 [5.75]	41.9 [1.65]	82.6 [3.25]	4	13.2 [29.1]
2"	150	62.9 [2.48]	152.4 [6]	17.6 [0.69]	19.1 [0.75]	120.7 [4.75]	41.9 [1.65]	91.9 [3.62]	4	3.8 [8.3]
	300	94.0 [3.7]	165.1 [6.5]	20.8 [0.82]	19.1 [0.75]	127 [5]	41.9 [1.65]	108.0 [4.25]	8	5.9 [13]
	600	94.0 [3.7]	165.1 [6.5]	25.4 [1]	19.1 [0.75]	127 [5]	41.9 [1.65]	108.0 [4.25]	8	8.3 [18.4]
	900/1,500	94.0 [3.7]	215.9 [8.5]	38.1 [1.5]	25.4 [1]	165.1 [6.5]	41.9 [1.65]	108.0 [4.25]	8	17.3 [38.1]
3"	150	94.0 [3.7]	190.5 [7.5]	22.4 [0.88]	19.1 [0.75]	152.4 [6]	41.9 [1.65]	127 [5]	8	7.3 [16]
	300	94.0 [3.7]	209.6 [8.25]	26.9 [1.06]	22.4 [0.88]	168.1 [6.62]	41.9 [1.65]	127 [5]	8	10.25 [22.6]
	600	94.0 [3.7]	209.6 [8.25]	31.6 [1.25]	22.4 [0.88]	168.1 [6.62]	41.9 [1.65]	127 [5]	8	14.2 [31.2]
	900	94.0 [3.7]	241.3 [9.5]	38.1 [1.5]	25.4 [1]	190.5 [7.5]	41.9 [1.65]	127 [5]	8	21.0 [46.2]
4"	150	94.0 [3.7]	228.6 [9]	22.4 [0.88]	19.1 [0.75]	190.5 [7.5]	41.9 [1.65]	157.2 [6.19]	8	10.6 [23.4]
	300	94.0 [3.7]	254.0 [1]	30.3 [1.19]	22.4 [0.88]	200.2 [7.88]	41.9 [1.65]	157.2 [6.19]	8	16.6 [36.6]
	600	94.0 [3.7]	273.1 [10.75]	38.1 [1.5]	25.4 [1]	215.9 [8.5]	41.9 [1.65]	157.2 [6.19]	8	27.1 [59.8]

→ Further dimensions and higher nominal pressures on request

Sealing geometry per JIS B 2220, RF



Legend:

Mb	Effective diameter of diaphragm
D	Outer diameter of diaphragm seal
b	Flange thickness
d ₂	Bore diameter
d ₄	Raised face diameter
f	Height of raised face
k	Pitch circle diameter
x	Number of bores

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DN	PN	Dimensions in mm [in]							x	Weight in kg [lb]
		Mb	D	b	d ₂	k	f	d ₄		
25A	10K	62.9 [2.48]	125 [4.92]	13 [0.52]	12 [0.75]	90 [3.54]	41.9 [1.65]	67 [2.64]	4	4.5 [10.0]
	16K	62.9 [2.48]	125 [4.92]	13 [0.52]	12 [0.75]	90 [3.54]	41.9 [1.65]	67 [2.64]	4	4.5 [10.0]
	20K	62.9 [2.48]	125 [4.92]	16 [0.59]	12 [0.75]	90 [3.54]	41.9 [1.65]	67 [2.64]	4	5.2 [11.3]
	30K	62.9 [2.48]	130 [5.12]	19 [0.75]	12 [0.75]	95 [3.74]	41.9 [1.65]	70 [2.76]	4	3.5 [7.7]
	40K	62.9 [2.48]	130 [5.12]	22 [0.83]	12 [0.75]	95 [3.74]	41.9 [1.65]	70 [2.76]	4	3.9 [8.6]
	63K	62.9 [2.48]	140 [5.51]	27 [1.03]	23 [0.91]	100 [3.97]	41.9 [1.65]	70 [2.76]	4	5.2 [11.6]
50A	5K	62.9 [2.48]	130 [5.12]	12 [0.47]	15 [0.59]	105 [4.13]	41.9 [1.65]	85 [3.35]	4	2.5 [5.5]
	10K	62.9 [2.48]	155 [6.10]	14 [0.55]	12 [0.75]	120 [4.72]	41.9 [1.65]	96 [3.78]	4	3.9 [8.6]
	16K	62.9 [2.48]	155 [6.10]	14 [0.55]	12 [0.75]	120 [4.72]	41.9 [1.65]	96 [3.78]	8	3.7 [8.2]
	20K	62.9 [2.48]	155 [6.10]	16 [0.59]	12 [0.75]	120 [4.72]	41.9 [1.65]	96 [3.78]	8	4.0 [8.9]
	30K	62.9 [2.48]	165 [6.50]	20 [0.79]	12 [0.75]	130 [5.12]	41.9 [1.65]	105 [4.13]	8	5.7 [12.6]
	40K	62.9 [2.48]	165 [6.50]	24 [0.95]	12 [0.75]	130 [5.12]	41.9 [1.65]	105 [4.13]	8	6.7 [14.8]
	63K	94.0 [3.70]	185 [7.83]	32 [1.26]	23 [0.91]	145 [5.71]	41.9 [1.65]	105 [4.13]	8	10.8 [23.7]
80A	5K	62.9 [2.48]	180 [7.09]	12 [0.47]	12 [0.75]	145 [5.71]	41.9 [1.65]	121 [4.76]	4	4.5 [10.0]
	10K	62.9 [2.48]	185 [7.83]	16 [0.59]	12 [0.75]	150 [5.91]	41.9 [1.65]	126 [4.96]	8	5.9 [12.9]
	16K	94.0 [3.70]	200 [7.87]	18 [0.71]	23 [0.91]	160 [6.30]	41.9 [1.65]	132 [5.20]	8	7.6 [16.6]
	20K	94.0 [3.70]	200 [7.87]	20 [0.79]	23 [0.91]	160 [6.30]	41.9 [1.65]	132 [5.20]	8	8.2 [18.1]
	30K	94.0 [3.70]	210 [8.27]	23 [1.02]	23 [0.91]	170 [6.69]	41.9 [1.65]	140 [5.51]	8	11.8 [25.9]
	40K	94.0 [3.70]	210 [8.27]	30 [1.18]	23 [0.91]	170 [6.69]	41.9 [1.65]	140 [5.51]	8	13.4 [29.6]
	63K	94.0 [3.70]	230 [9.06]	38 [1.50]	25 [0.98]	185 [7.83]	41.9 [1.65]	140 [5.51]	8	20.0 [44.0]
100A	5K	94.0 [3.70]	200 [7.87]	14 [0.55]	12 [0.75]	165 [6.50]	41.9 [1.65]	141 [5.55]	8	6.2 [13.8]
	10K	94.0 [3.70]	210 [8.27]	16 [0.59]	12 [0.75]	175 [6.89]	41.9 [1.65]	151 [5.95]	8	7.7 [17.0]
	16K	94.0 [3.70]	225 [8.86]	20 [0.79]	12 [0.75]	185 [7.83]	41.9 [1.65]	160 [6.30]	8	10.8 [23.7]
	20K	94.0 [3.70]	225 [8.86]	22 [0.87]	12 [0.75]	185 [7.83]	41.9 [1.65]	160 [6.30]	8	11.6 [25.5]
	30K	94.0 [3.70]	240 [9.45]	30 [1.18]	25 [0.98]	195 [7.68]	41.9 [1.65]	160 [6.30]	8	17.5 [38.5]
	40K	94.0 [3.70]	250 [9.85]	34 [1.34]	25 [0.98]	205 [8.07]	41.9 [1.65]	165 [6.50]	8	21.5 [47.4]
	63K	94.0 [3.70]	270 [10.63]	42 [1.65]	27 [1.06]	220 [8.66]	41.9 [1.65]	165 [6.50]	8	30.6 [67.4]

→ Further dimensions and higher nominal pressures on request

Accessories and spare parts

Model	Description		Order number
	IBF2, IBF3	Monoblock with flange connection → See data sheet AC 09.25	On request
	910.16	Instrument mounting bracket form H per DIN 16281, 100 mm, aluminium, black	9091858
		Instrument mounting bracket form H per DIN 16281, 100 mm, stainless steel	9091882
		→ See data sheet AC 09.05	On request

Ordering information

Diaphragm seal:

Diaphragm seal model / Process connection (standard, flange size, nominal pressure, sealing face) / Material combination (upper body of diaphragm seal, wetted parts) / 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) / Material combination (upper body of diaphragm seal, wetted parts) / 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) / Flushing ring

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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.

In case of a different interpretation of the translated and the English data sheet, the English wording shall prevail.



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