Diaphragm seal with sterile connection
For sanitary applications
Models 990.18, 990.19, 990.20 and 990.21, threaded connection

for further approvals
see page 3

Applications

- Food and beverage production
- For dairies, dairy products
- Breweries
- Soft drink production

Special features

- For cleaning easy to remove
- Quick cleaning of measuring point, without residue
- Suitable for COP
- 3-A compliant

Diaphragm seal with sterile connection, models 990.18, 990.19 and 990.20

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".

The model 990.18, 990.19, 990.20 and 990.21 diaphragm seals with threaded connection are particularly suited for use in the food industry. The process connection enables a hygienic integration 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 body 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 the WIKA model 990.18, 990.19, 990.20 and 990.21 diaphragm seals are used for pressure measurement in various process steps, e.g. filtration, separation, pasteurisers and filling systems.

Data sheets showing similar products:
Versions with clamp connection; models 990.22, 990.52 and 990.53; see data sheet DS 99.41
Versions with pressure transmitter; model SA-11; see data sheet PE 81.80

Standard version

Type of process connection
Thread with grooved union nut or threaded coupling
Model 990.18: Threaded pipe connection DIN 11851
Model 990.19: Threaded connection SMS standard (SS 3352)
Model 990.20: Threaded connection IDF standard (ISO/DIS 2853 and BS 4825 part 4)
Model 990.21: Threaded connection APV-RJT standard (BS 4825 part 5)
For exact designs and nominal widths see tables on page 4 to 6

Nominal pressure
See tables on page 4 to 6

Measuring ranges
min. 0 ... 1 bar, max. 0 ... 25 bar or 0 ... 40 bar
(also vacuum and +/- measuring ranges)

Material of upper body
Stainless steel 1.4435 (316 L)

Material of wetted parts
Diaphragm: Stainless steel 1.4435 (316L)

Surface roughness of wetted parts
Ra ≤ 0.76 µm 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 mg/m²)

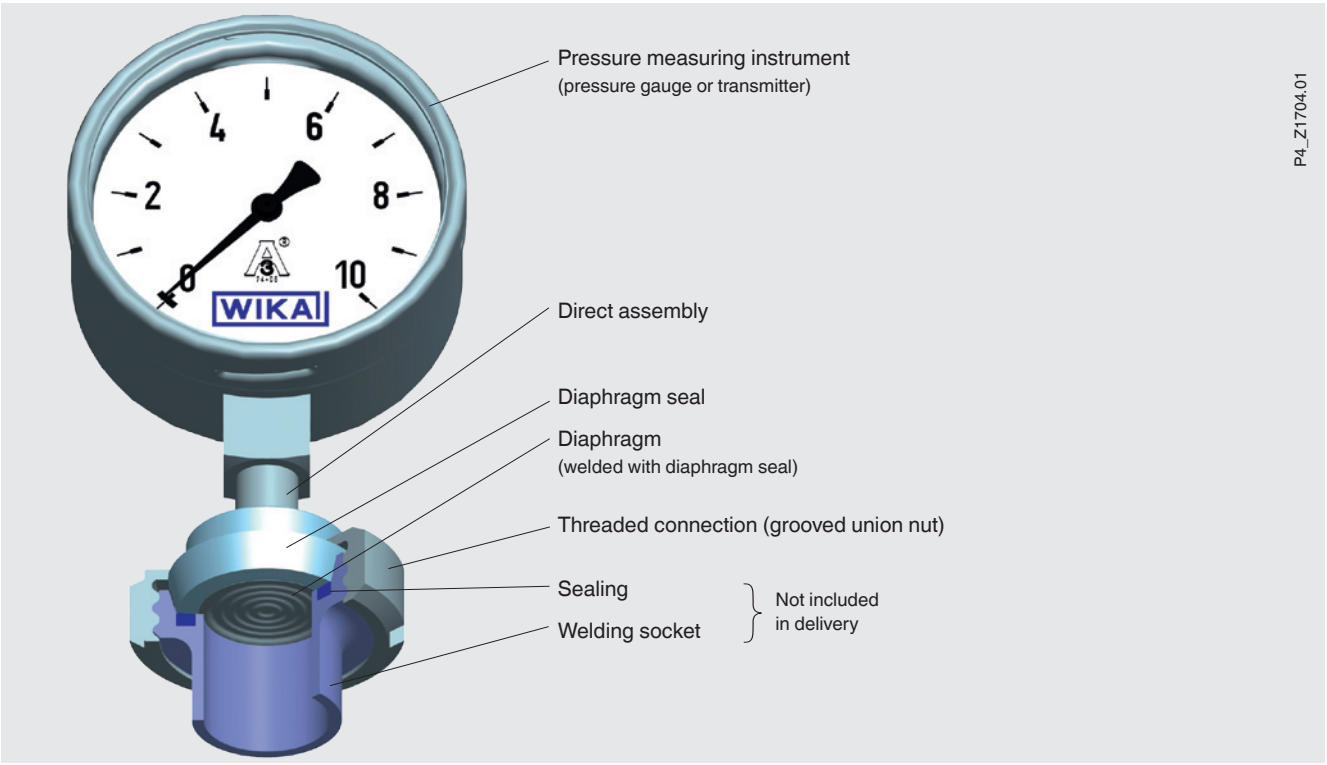
Connection to the measuring instrument
Axial weld-in connection

Options

- Process connection with threaded coupling
- Surface roughness of wetted parts
  Ra ≤ 0.38 µm per ASME BPE SF4, only with electropolished surface (except for weld seam)
- Sealing from NBR or PTFE
- Connection to the 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 74-05

Installation example

Diaphragm seal, sterile connection, model 990.18 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)

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 D and ISO 15001 (< 220 mg/m²)
  - Oil and grease free per ASTM G93-03 level C and ISO 15001 (< 66 mg/m²)
- 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, model 910.16, data sheet AC 09.07)
  - 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
Standard	
Stainless steel 1.4435 (316L)	Stainless steel 1.4435 (316L)

Further material combinations on request

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)
- 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 74-05
- EHEDG conformity of the model 990.18 diaphragm seal (only in combination with ASEPTO-STAR k-flex upgrade, sealing from Kieselmann GmbH)
- Manufacturer's declaration regarding EU regulation 1935/2004 EC
- Others on request

1) Option

Approvals and certificates, see website

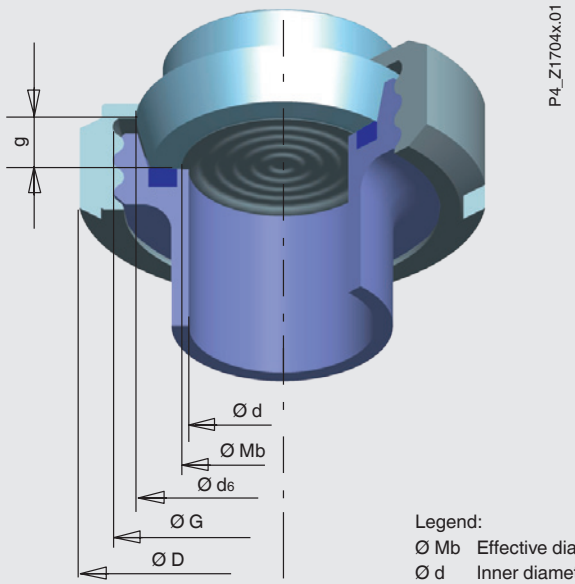
Dimensions in mm

Model 990.18
Type of process connection: Threaded pipe connection following DIN 11851
Pipe standard: Pipes per DIN 11850 row 2

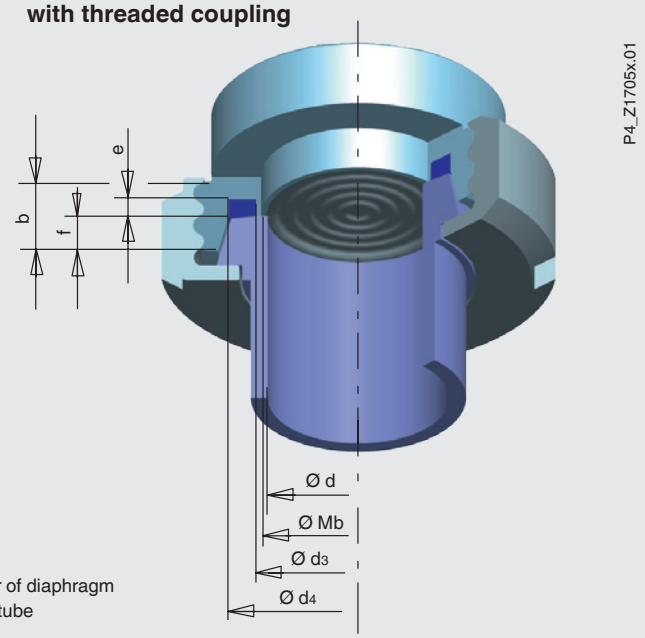
3-A compliant (only in combination with a sealing with support ring per ISO 2853)

EHEDG compliant (only in combination with ASEPTO-STAR k-flex upgrade, sealing from Kieselmann GmbH)

with grooved union nut



with threaded coupling



Legend:
Ø Mb Effective diameter of diaphragm
Ø d Inner diameter of tube
Ø G Thread

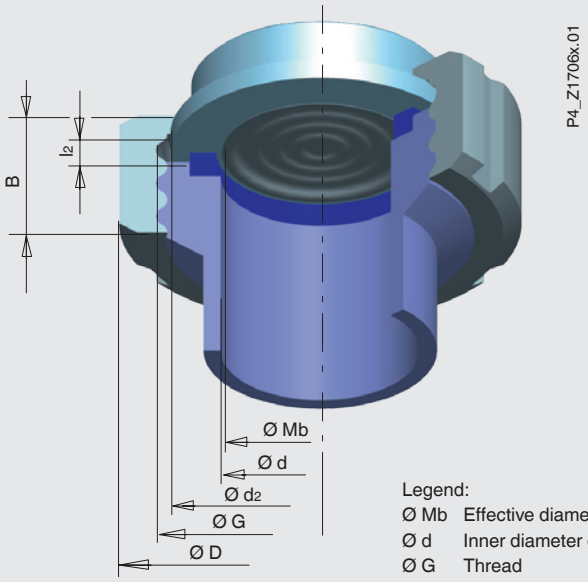
DN	For pipe Outer Ø x wall thickness	PN	Dimensions in mm G	b	d	Mb	D	d_3	d_4	d_6	e	f	g	Weight in kg
25	29 x 1.5	40	RD 52 x 1/6	14	26	25	63	30	39.8	44	3.5	7	10	0.4
32	35 x 1.5	40	RD 58 x 1/6	14	32	32	70	36	45.8	50	3.5	7	10	0.5
40	41 x 1.5	40	RD 65 x 1/6	14	38	35	78	42	51.8	56	3.5	7	10	0.75
50	53 x 1.5	25	RD 78 x 1/6	14	50	52	92	54	63.8	68.5	3.5	7	11	0.8
65	70 x 1.5	25	RD 96 x 1/6	16	67	52	112	71	80.8	86	3.5	7	12	1.0
80	85 x 2	25	RD 110 x 1/4	20	81	71	127	85	94.8	100	3.5	8	12	1.25

Model 990.19

Type of process connection: Threaded connection following SMS standard (SS 3352)

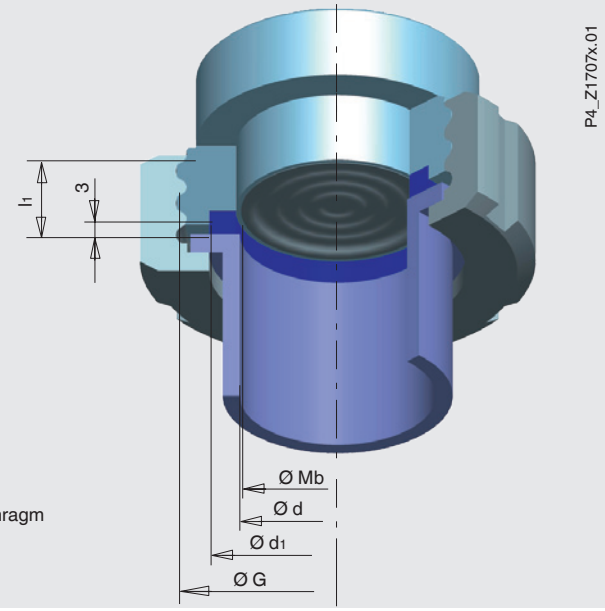
Pipe standard: Pipes per ISO 1127 row 2 or ISO 2037/1992

with grooved union nut



Legend:
Ø Mb Effective diameter of diaphragm
Ø d Inner diameter of tube
Ø G Thread

with threaded coupling



DN	For pipe Outer Ø x wall thickness	PN	Dimensions in mm G	d	Mb	D	d_1	d_2	B	l_1	l_2	Weight in kg
1 ½"	38 x 1.2	40	RD 60 x 1/6	35.6	35	74	48	55	25	15	4	0.8
2"	51 x 1.2	40	RD 70 x 1/6	48.6	45	84	61	65	26	15	4	1.0

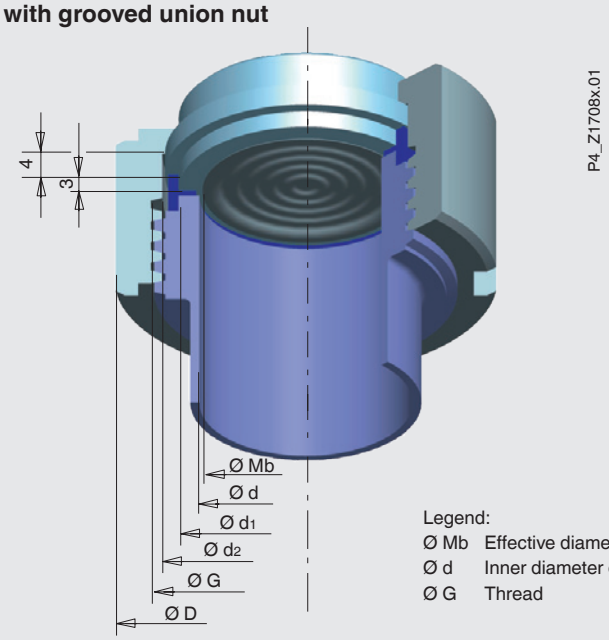
Model 990.20

Type of process connection: Threaded connection following IDF standard (ISO/DIS 2853 and BS 4825 part 4)

Pipe standard: Pipes per ISO 1127 row 2 or ISO 2037/1992

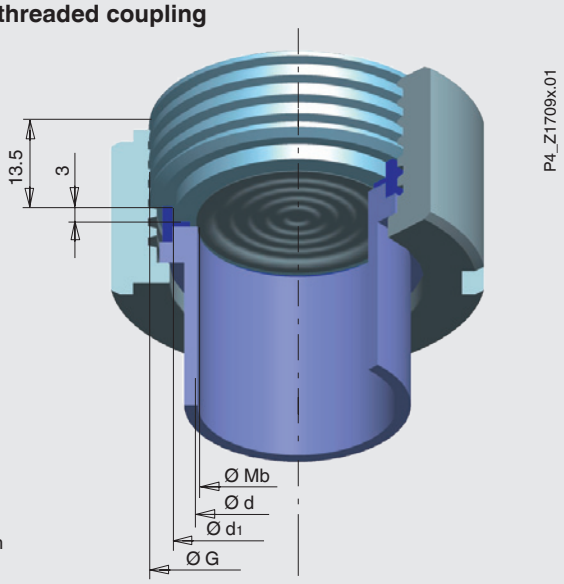
3-A compliant (only in combination with a sealing with support ring per ISO 2853)

with grooved union nut



Legend:
Ø Mb Effective diameter of diaphragm
Ø d Inner diameter of tube
Ø G Thread

with threaded coupling



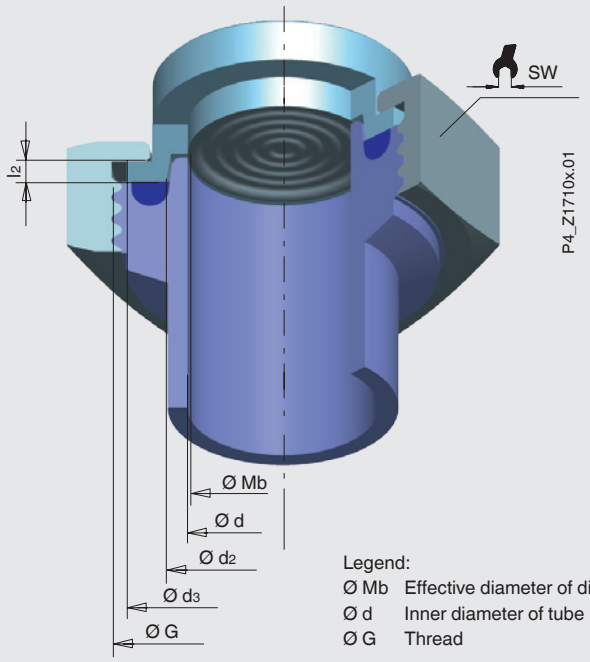
DN	For pipe Outer Ø x wall thickness	PN	Dimensions in mm G	d	Mb	D	d_1	d_2	Weight in kg
1 ½"	38.6 x 1.5	40	1 ½" IDF	35.6	32	64	42.7	47	0.8
2"	51.6 x 1.5	40	2" IDF	48.6	45	79	56.2	60.5	1.0

Model 990.21

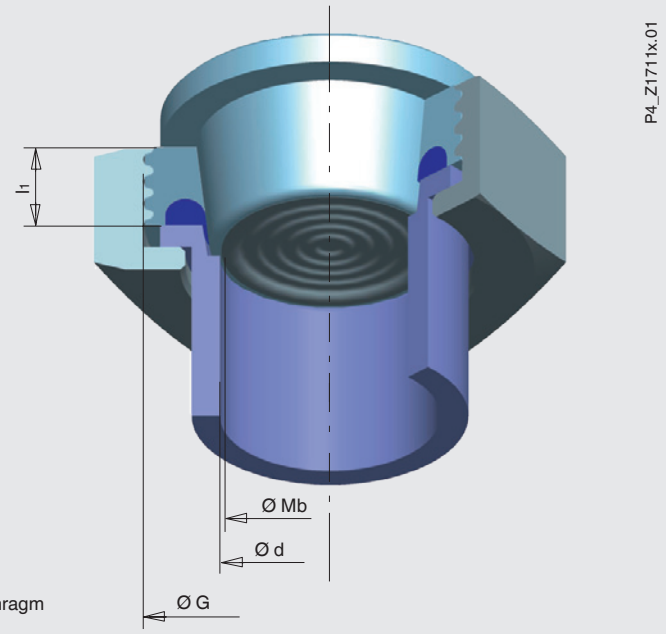
Type of process connection: Threaded connection following APV RJT standard (BS 4825 part 5)

Pipe standard: Pipes per BS 4825 part 1 or O.D.-tube

with grooved union nut



with threaded coupling



Legend:

Ø Mb Effective diameter of diaphragm
Ø d Inner diameter of tube
Ø G Thread

DN	For pipe Outer Ø x wall thickness	PN	Dimensions in mm								Weight in kg
			G	d	Mb	d_2	d_3	l_1	l_2	SW	
1 ½"	38.1 x 1.6	40	2 5/16 x 8"	34.9	32	40.5	54	14.3	2.4 ... 4	65	0.9
2"	50.8 x 1.6	40	2 7/8 x 6"	47.6	40	53.2	66.7	14.3	2.4 ... 4	80	1.1

Ordering information

Diaphragm seal:

Diaphragm seal model / Process connection (type and specification 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 and specification 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

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