Diaphragm Seals

DF

Summary

Model	Name and feature
DF standard style	Normal threaded connection type
DF1	I–Shape Flange
DF2	Open Flange
DF4	Angle adjustable diaphragm Seals
DF5	Extended type diaphragm Seals
DF6, DF7	Sanitary diaphragm seals
DF8	Welded one–piece type diaphragm Seals
DF10	In Line Diaphragm Seals

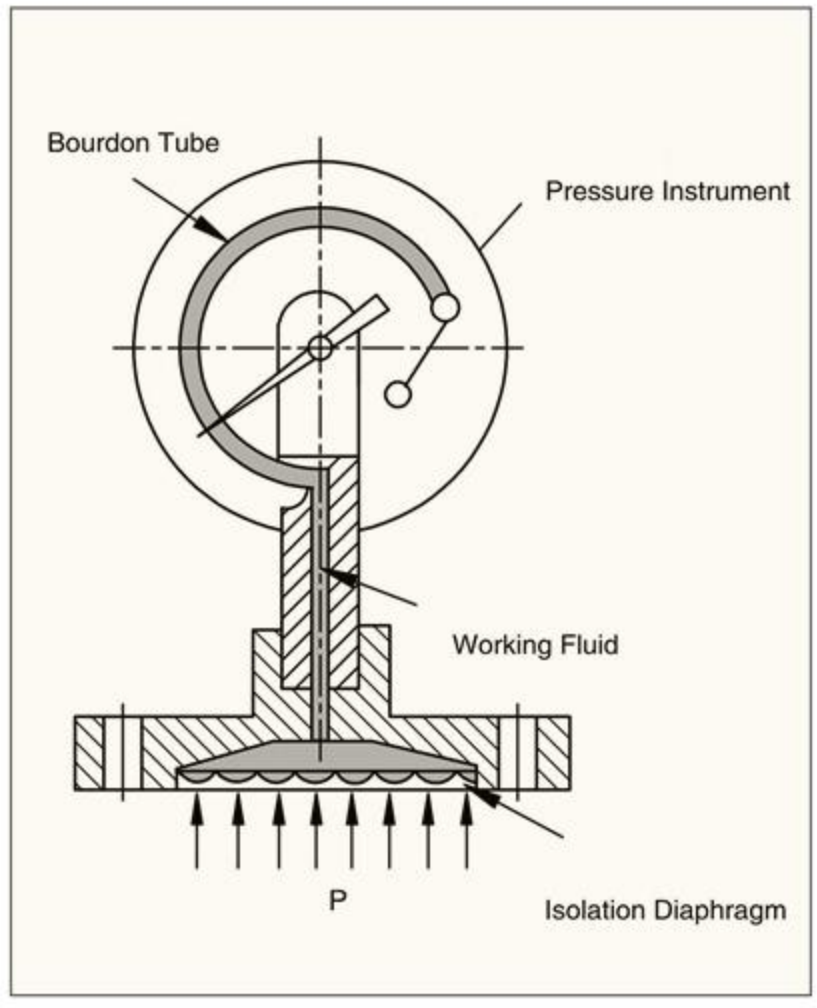
Diaphragm Seals

DF

Product Overview

Series diaphragm pressure gauge (chemical seals) is composed of a conventional pressure measuring instrument, a connector and a diaphragm seal.

This combination enables a general purpose pressure gauge to measure media of strong corrosion, high temperature, high viscosity, containing suspended matter or crystallizing. Diaphragm gauges are universally used in petrochemical, alkali, chemical fiber, pharmaceutical, metallurgical, and food industries.



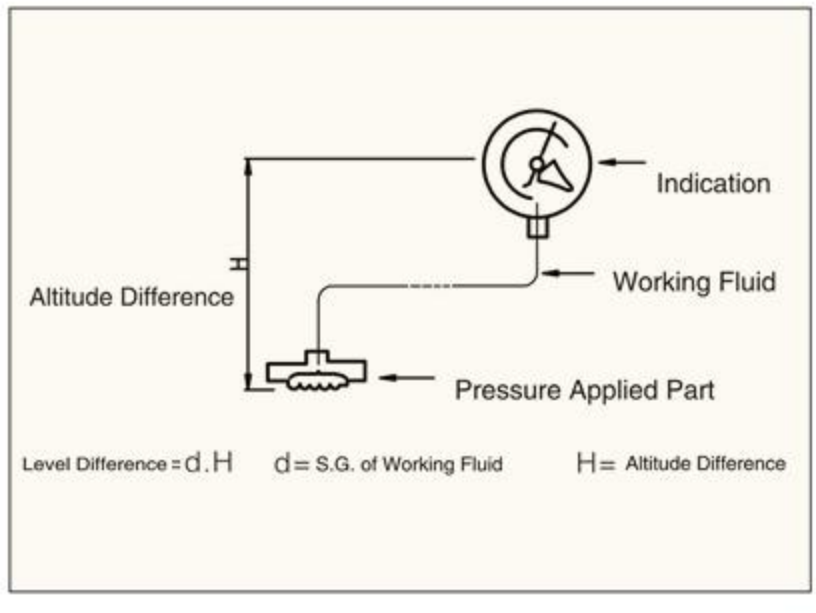
Configuration Principle

This illustration shows the operating principle of the diaphragm pressure gauge. The diaphragm is deflected by the pressure of medium P, and an equivalent pressure P' is generated. With transmitting through working fluid, the pressure P' deflect the elastic element of a pressure measuring instrument which thereafter shows the pressure value.

Level difference of Diaphragm pressure gauge seals liquid

When a diaphragm pressure gauge is mounted with pressure gauge and diaphragm seal at different positions, the effect of level difference should be taken into consideration (especially for a diaphragm gauge with capillary).

As the illustration shows, with a S.G. of the working fluid at approx.1, and a level difference of 1m, the pressure difference is approx.0.1 Bar



Diaphragm Seals

DF

Temperature Influence of diaphragm pressure

The temperature influence of a diaphragm pressure gauge is relative to expansion coefficient of the seals working fluid, rigidity of the diaphragm, and temperature of pressed part. When working temperature deviates from 20 ± 5℃,the indication varies within 0.1%/℃ for rigid system, and within 0.1+0.025L%/℃ (L–length of capillary in m.) for flexible sys tem (remote mounting). Diaphragm pressure gauges are filled with suitable working fluid according to different operating conditions.

Option for Working Fluid				
Name of Working Fluid	Temperature range for Diaphragm equipment	g/cm² Specific Gravity	1/℃ Factor of Expansion	Purpose
Glycerin–Water Solution	–5–100℃	1.27	0.61×10^{-3}	Food
Silicon (low viscidity)	–40–130℃	0.94	1.08×10^{-3}	General
Silicon (high viscidity)	–30–240℃	1.07	0.95×10^{-3}	High Temperature
Fluorocarbon Oil	–30–160℃	1.93	0.75×10^{-3}	Hydrogen, Oxygen, Salts, Acid
Vegetable Oil	–5–100℃	0.93	1.03×10^{-3}	Food

or other special working fluid

Corrosion-Proof properties of diaphragm pressure gauge

Teknopoli Diaphragm Pressure Gauge satisfies customers' requirements of both environmental conditions and flow conditions (corrosive media) based on its significant corrosion–proof properties. Choose various pressure gauges combined with appropriate separator according to environmental conditions. Choose material of diaphragm and housing compatible with corrosive media.

①.Diaphragm Material: AISI 316, AISI316L, Monel (Cu30Ni70), Hastelloy(HC276), Tantalum (Ta), Fluoroplastic (F4)
②.Body Material: 1Cr18Ni9Ti, AISI 316, AISI 316L, Fluoroplastic (F4), Fluoroplastic Coated Stainless Steel
③.Gasket Mateial: Nitrile Rubber, Viton, Silicone Rubber, Fluoroplastic

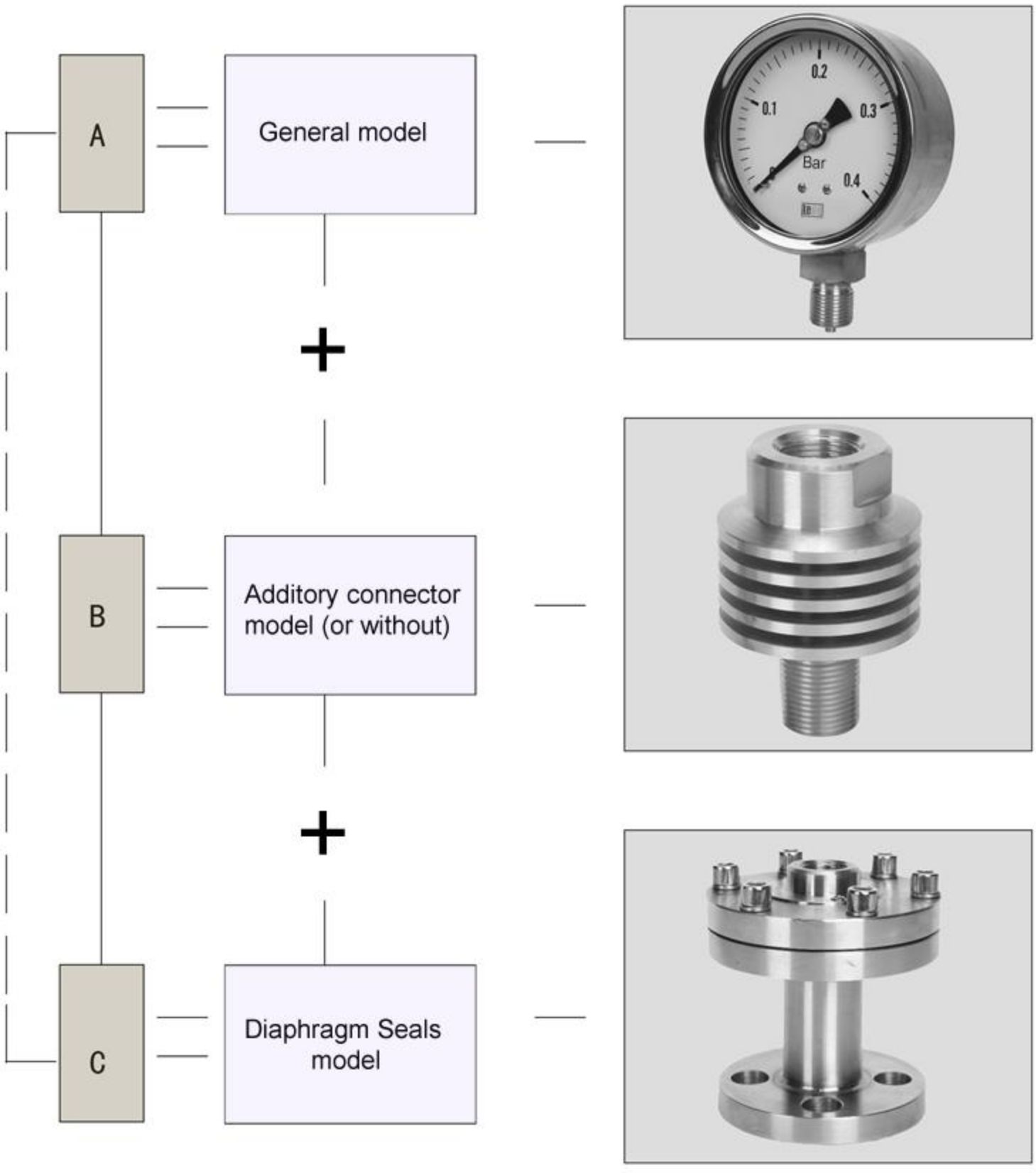
Material selection for diaphragm

Corrosive media	AISI 316L	Tantalum (Ta)	Monel (Ni70Cu30)	Hastelloy (HC)	Ti	Polytetraf Cuoroethylene
Vitriol(H_2so_4)	△	○	V	V	X	V
Nitric acid(HNO_3)	V	○	X	V	V	V
Muriatic acid (HCl)	X	○	X	V	△	V
Phosphoric acid (H_3PO_4)	V	○	V	V	X	V
Acetate (CH_3COOH)	V	○	V	○	○	V
(NaOH)	○	△	○	○	V	V
Pure alkali (Na_2CO_3)	○	○	○	V	V	V
Saleratus ($NaHCO_3$)	○	○	○	○	○	V
Chlorine (Cl)	Dry V Wet x	○	Dry V Wet x	V	Dry x Wet ○	V
Bromine (Br_2)	Dry x Wet △	○	Dry ○ Wet x	○	Dry X Wet x	V
Ammonia (NH_3)	V	x	x	○	○	V
Sea water (30% NaCl)	V	○	○	○	○	V

Remark: ○— best; △— conditional; V— use; x — no using

Note: Standard material is AISI 316L, corrosion–proof materials should be applied in normal temperature. Others please contact us.

Model =A+B+C



How to Order

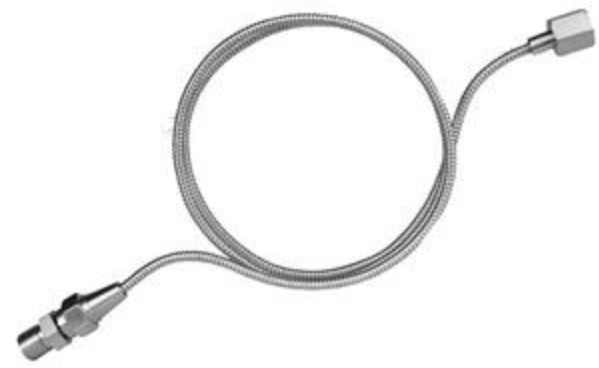
Please specify the following properties when the manometer+accessories+diaphragm seals ordering.

- Manometer model number,
- Additory connector model (or without)
- Diaphragm seals model (or without)

For example: *MN-P-160-(0/100 Bar)-R1/2-1-DFNH*

AG1 Overpressure Protector

AY1 Capillary



AR1 Radiator

AZ1 Damper

AR2 Radiator

AC Special Angle

AR3 High–Temp Radiator

AR4 Siphon

Diaphragm Seals

DF

Types

DF Standard Type

DF1 I–Shape Flange

DF2 Welded diaphram

DF2 Clamped diaphram

DF4 Angle Adjustable

F4A

F4B

DFA Threaded

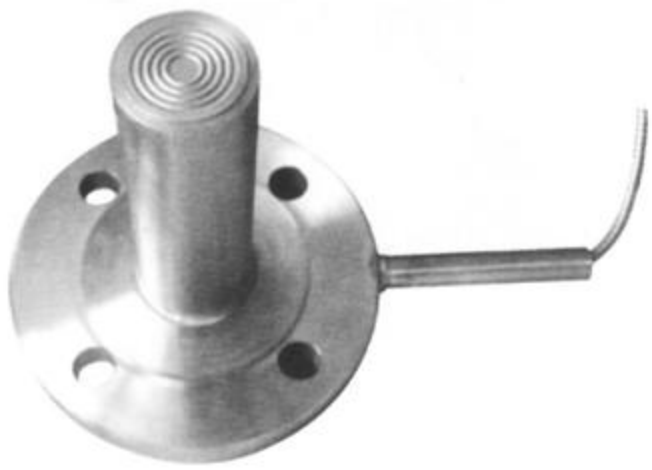
DFB Extended type

Diaphragm Seals

DF

Types

DF5 Extended type



DF6 Clamp Connection

DF7 Threaded Connection (sanitary type)

DF8 Welded one–piece Type

DF10 In line Diaphragm Seals

DF200 Maximum pressure range: 5000psi

DF Diaphragm Seals With Threaded Connection

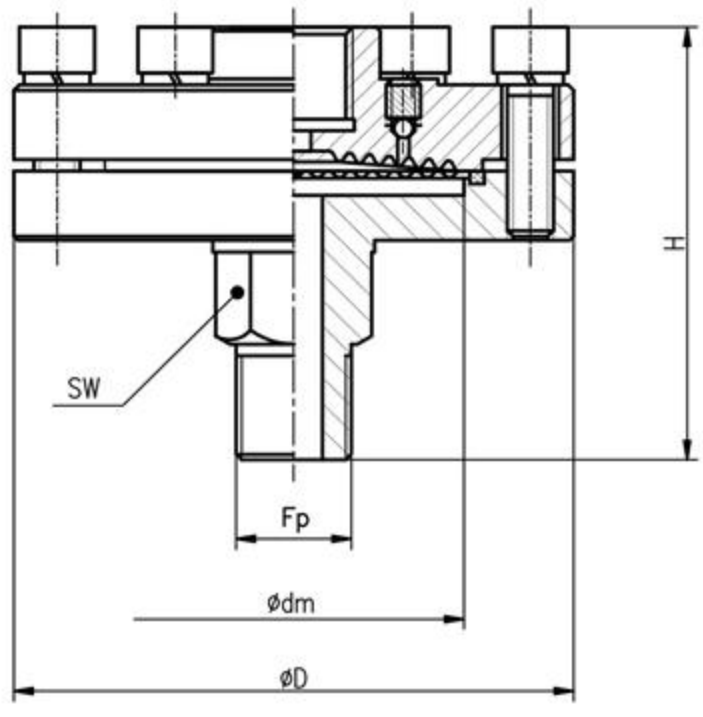
Special items

- High temperature: Max 240℃
- Diaphragm material: Hastelloy C,Tantalum,Titanium, Monel, 316L PTFE coate
- Wetted material: 304,316, 316L (or PTFE coated)
- Connection: other on request
- Filling liquid: As different media, optional fluorocarbon oil, –60··+120℃, Food oil, –20··+160℃

Specifications

- Range: DFNH **0-2,5/0-250 Bar**
  DFNM **0-40/0-250 Bar**
  DFNS **-1-0/0-60 Bar**
  DFNG **0-100/0-400 Bar**
- Accuracy: ±1.6%
- Working Temperature: –45··+150℃
- Diaphragm Material: 316L
- Wetted material: 316+BUNA
- Connection: Thread 1/2" NPT, R 1/2", M20x1.5
- Filling liquid: Silicone oil

Dimensions (mm.)



Type code	D	dm	Fp/Fm	H	SW
65 DFNH	61.5	42	M20X1.5/NPT1/2	66	24
77 DFNM	77	42	M20X1.5/NPT1/2	71	24
97 DFNS	97	61	M20X1.5/NPT1/2	72	24
97 DFNG	97	30	M20X1.5/NPT1/2	72	24

DF1 I-Shape Flange

Special items

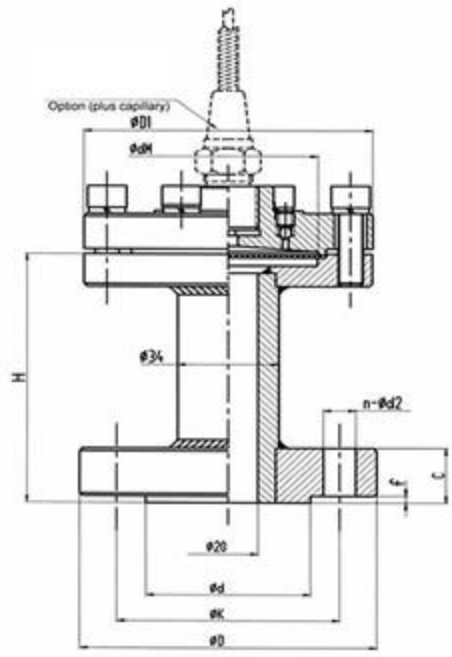
- High temperature: Max 240℃
- Diaphragm material: Hastelloy C, Tantalum, Titanium, Monel, 316L PTFE coated
- Wetted material: 316, 316L (or PTFE)
- Connection: other on request
- Filling liquid: As different media, optional fluorocarbon oil, –60‥+120℃, Food oil, –20‥+160℃

Specifications

- Range: DFNS **-1-0/0-60 Bar**
  DFNG **0-100/0-400 Bar**
- Accuracy: ± 1.6%
- Working Temperature: –45‥+220℃
- Diaphragm Material: 316L
- Wetted material: 304
- Filling liquid: Silicone oil

Dimensions (mm.)

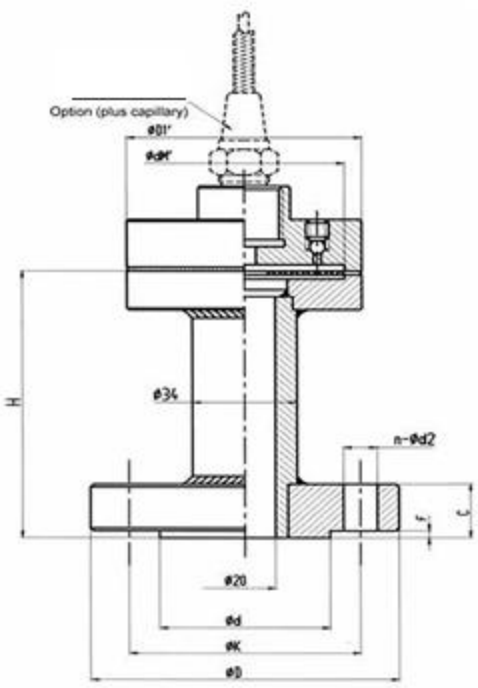
DF1 I-shape flange



ϕ dM=56,
range: -1～0 / 0～40 Bar
ϕ dM=36,
range: 0～16 / 0～400 Bar

Flange [DIN]

(Flange)									(Diaphragm Seals)				
DN [mm]	PN [bar]	DIMENSION) [mm]							D1	dM	D1'	dM'	H
		D	C	d2	K	f	d	n					
15	10/40	95	14	14	65	2	46	4	97	56	61.5	49	82
20	10/40	105	16	14	75	2	56	4	97	56	61.5	49	82
25	10/40	115	16	14	85	2	65	4	97	56	61.5	49	82
40	10/40	150	18	18	110	2	84	4	97	56	61.5	49	82
	63/100	170	26	22	125	2	84	4	77	36	45	30	82
	160	170	36	22	125	2	84	4	77	36	45	30	82
	260	180	39	29	124	7	73	4	77	36	45	30	82
	420	205	52	32	146	7	73	4	77	36	45	30	82
50	10/40	165	20	18	125	2	99	4	97	56	61.5	49	82
	63	180	26	22	135	2	99	4	77	36	45	49	82
	100	195	28	26	145	2	99	4	77	36	45	30	82
	160	195	38	26	145	2	99	4	77	36	45	30	82
	260	215	46	26	165	7	92	8	77	36	45	30	82
	420	235	58	29	171.5	7	92	8	77	36	45	30	82
80	10/16	200	20	18	160	2	132	8	97	56	61.5	49	82
	25/40	200	24	18	160	2	132	8	97	56	61.5	49	82
	63	215	28	22	170	2	132	8	77	36	45	30	82
	100	230	32	26	180	2	132	8	77	36/30	45	30	82
100	10/16	220	22	18	180	2	156	8	97	56	61.5	49	82
	25/40	235	24	22	190	2	156	8	97	56	61.5	49	82
	63	250	30	26	200	2	156	8	77	36	45	30	82
	100	265	36	30	210	2	156	8	77	36/30	45	30	82



ϕ dM=49,
range: -1～0 / 0～40 Bar
ϕ dM=30,
range: 0～16 / 0～400 Bar

Flange [ANSI B16.5]

(Flange)									(Diaphragm Seals)				
DN [in]	PN [bar]	(DIMENSION) [mm]							D1	dM	D1'	dM'	H
		D	C	d2	K	f	d	n					
1/2	150	90	14	16	60.5	1.6	35	4	97	56	61.5	49	82
	300	95	16	16	66.5	1.6	35	4	97	56	61.5	49	82
3/4	150	100	16	16	70	1.6	43	4	97	56	61.5	49	82
	300	120	18	20	82.5	1.6	43	4	97	56	61.5	49	82
1	150	110	16	16	79.5	1.6	51	4	97	56	61.5	49	82
	300	125	18	20	89	1.6	51	4	97	56	61.5	49	82
	600	125	24	20	89	6.4	51	4	77	36	45	30	82
	900/1500	150	37	26	101.5	6.4	51	4	77	36	45	30	82
1 1/2	150	130	22	16	98.5	1.6	73	4	97	56	61.5	49	82
	300	155	22	22	114.5	1.6	73	4	97	56	61.5	49	82
	600	155	29.5	22	114.5	6.4	73	4	77	36	45	30	82
	900/1500	180	39	30	124	6.4	73	4	77	36	45	30	82
2	150	150	20	20	120.5	1.6	92	4	97	56	61.5	49	82
	300	165	22.5	20	127	1.6	92	8	97	56	61.5	49	82
	600	165	32	20	127	6.4	92	8	77	36	45	30	82
	900/1500	215	45	26	165	6.4	92	8	77	36	45	30	82
3	150	190	24	20	152.5	1.6	127	4	97	56	61.5	49	82
	300	210	29	22	168.5	1.6	127	8	97	56	61.5	49	82
	600	210	38.5	22	168.5	6.4	127	8	77	36	45	30	82
	900	240	45	26	190.5	6.4	127	8	77	36	45	30	82
	1500	270	54.5	33	203	6.4	127	8	77	36/30	45	30	82
4	150	230	24	20	190.5	1.6	158	8	97	56	61.5	49	82
	300	255	32	22	200	1.6	158	8	97	56	61.5	49	82
	600	275	45	26	200	6.4	158	8	77	36	45	30	82
	900	295	51	32	235	6.4	158	8	77	36	45	30	82
	1500	310	60.5	36	241.5	6.4	158	8	77	36/30	45	30	82

DF2 Open Flange

Special items

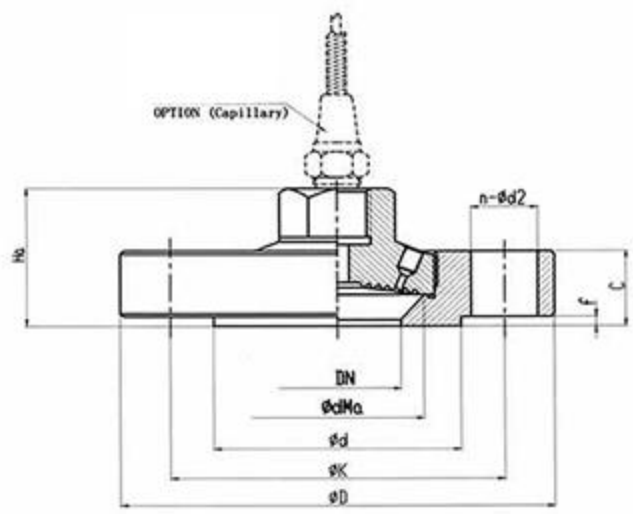
- High temperature: Max 240℃
- Diaphragm material: Hastelloy C, Tantalum,Titanium, Monel, 316L PTFE coated
- Flange material: 316, 316L
- Instrument connection: other on request
- Filling liquid: As different media, optional fluorocarbon oil, –60..+120℃, Food oil, –20... +160℃
- Capillary: max length 10m, material 304 covered With 304 armour, other on request

Specifications

- Range: -1-0/0-160 Bar
- Accuracy: ± 1.6%
- Working Temperature: –45..+150℃
- Diaphragm Material: 316L
- Flange material: 304
- Filling liquid: Silicone oil
- Flange standard: ANSI B 16.5
  DIN 2501

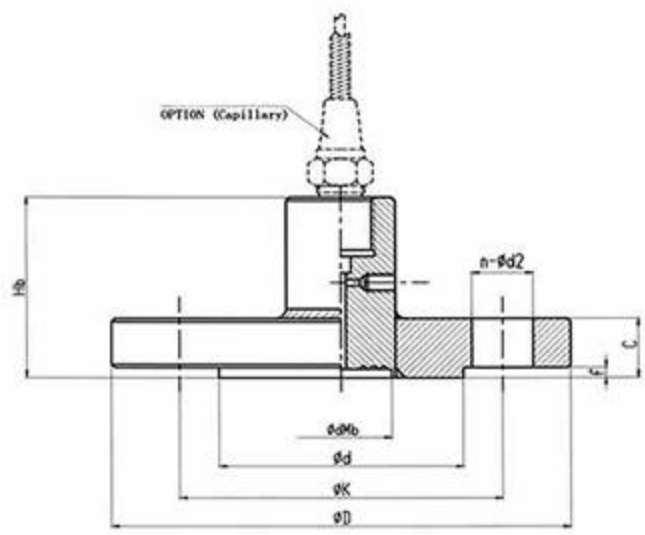
Dimensions (mm.)

DF2 flange



[DIN]

DN [in.]	PN [class]	(DIMENSION) [mm]							A		B	
		D	C	d2	K	f	d	n	dMa	Ha	dMb	Hb
15	10/40	95	14	14	65	2	46	4	-	-	30	40
20	10/40	105	16	14	75	2	56	4	-	-	30	40
25	10/40	115	16	14	85	2	65	4	49	40	49	40
40	10/40	150	18	18	110	2	84	4	49/75	40	49	40
	63/100	170	26	22	125	2	84	4	36	46	30	60
	160	170	36	22	125	2	84	4	36	56	30	75
	260	180	39	29	124	7	73	4	36	59	30	75
	420	205	52	32	146	7	73	4	36	72	30	85
50	10/40	165	20	18	125	2	99	4	49/75	40	49	40
	63	180	26	22	135	2	99	4	36	46	30	60
	100	195	28	26	145	2	99	4	36	48	30	60
	160	195	38	26	145	2	99	4	36	58	30	75
	260	215	46	26	165	7	92	8	36	66	30	80
	420	235	58	29	171.5	7	92	8	36	78	30	85
80	10/16	200	20	18	160	2	132	8	49/75	40	49	40
	25/40	200	24	18	160	2	132	8	49/75	44	49	40
	63	215	28	22	170	2	132	8	36	48	30	60
	100	230	32	26	180	2	132	8	36	52	30	60



[ANSI B16.5]

DN [in.]	PN [class]	(DIMENSION) [mm]							A		B	
		D	C	d2	K	f	d	n	dMa	Ha	dMb	Hb
1/2	150	90	14	16	60.5	1.6	35	4	-	-	-	-
	300	95	16	16	66.5	1.6	35	4	-	-	-	-
3/4	150	100	16	16	70	1.6	43	4	-	-	30	55
	300	120	18	20	82.5	1.6	43	4	-	-	30	55
1	150	110	16	16	79.5	1.6	51	4	49	40	30	55
	300	125	18	20	89	1.6	51	4	49	40	30	55
	600	125	24	20	89	6.4	51	4	49	44	30	65
	900/1500	150	37	26	101.5	6.4	51	4	30	57	30	75
1 1/2	150	130	22	16	98.5	1.6	73	4	49/56	42	49	60
	300	155	22	22	114.5	1.6	73	4	49	42	49	60
	600	155	29.5	22	114.5	6.4	73	4	49	50	49	70
	900/1500	180	39	30	124	6.4	73	4	49	59	49	75
2	150	150	20	20	120.5	1.6	92	4	49/56	40	49	60
	300	165	22.5	20	127	1.6	92	8	49	43	49	60
	600	165	32	20	127	6.4	92	8	36	52	30	70
	900/1500	215	45	26	165	6.4	92	8	36	65	30	75
3	150	190	24	20	152.5	1.6	127	4	49/56	44	49	70
	300	210	29	22	168.5	1.6	127	8	49/56	49	49	75
	600	210	38.5	22	168.5	6.4	127	8	36	59	30	85
	900	240	45	26	190.5	6.4	127	8	36	65	30	90
	1500	270	54.5	33	203	6.4	127	8	36	75	30	95
4	150	230	24	20	190.5	1.6	158	8	49/56	44	49	70
	300	255	32	22	200	1.6	158	8	49/56	52	49	75
	600	275	45	26	200	6.4	158	8	36	65	30	85
	900	295	51	32	235	6.4	158	8	36	71	30	95
	1500	310	60.5	36	241.5	6.4	158	8	36	81	30	95

DF4 Angle Adjustable

DF4A

DF4B

Special items

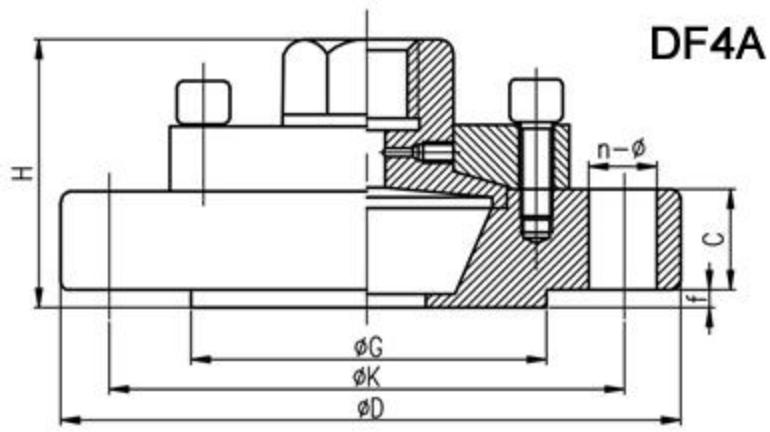
- High temperature: Max 240℃
- Diaphragm material: Hastelloy C, Tantalum,Titanium, Monel, 316L PTEE coated
- Flange material: 316, 316L
- Instrument connection: other on request
- Filling liquid: As different media, optional Fluorocarbon oil, −60..+120℃,Food oil −20..+160℃
- Capillary: max length 10m, material 304 covered with 304 armour, other on request

Specifications

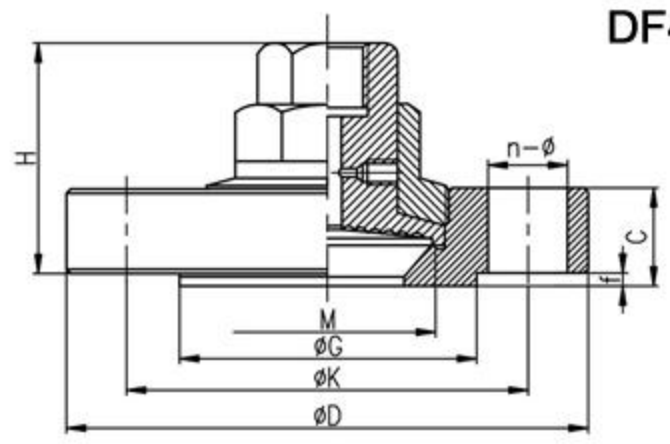
- Range: 0-0,3/0-400 Bar
- Accuracy: ± 1.6%
- Working Temperature: −45..+150℃
- Diaphragm Material: 316L
- Flange material: 304
- Flange standard: ANSI B 16.5
  DIN 2501
- Filling liquid: Silicone oil

Dimensions (mm.)

DF4A



DF4B



DF5-A Extended Diaphragm Seals With Flanged Connection

Special items

- High temperature: Max 240℃
- Diaphragm material: Hastelloy C, Tantalum,Titanium, Monel, 316L PTFE coated
- Flange material: 316, 316L
- Instrument connection: other on request
- Filling liquid: As different media, optional fluor–ocarbon oil, –60..+120℃,Food oil –20..+160℃
- Extension: other on request
- Capillary: max length 10m, material 304

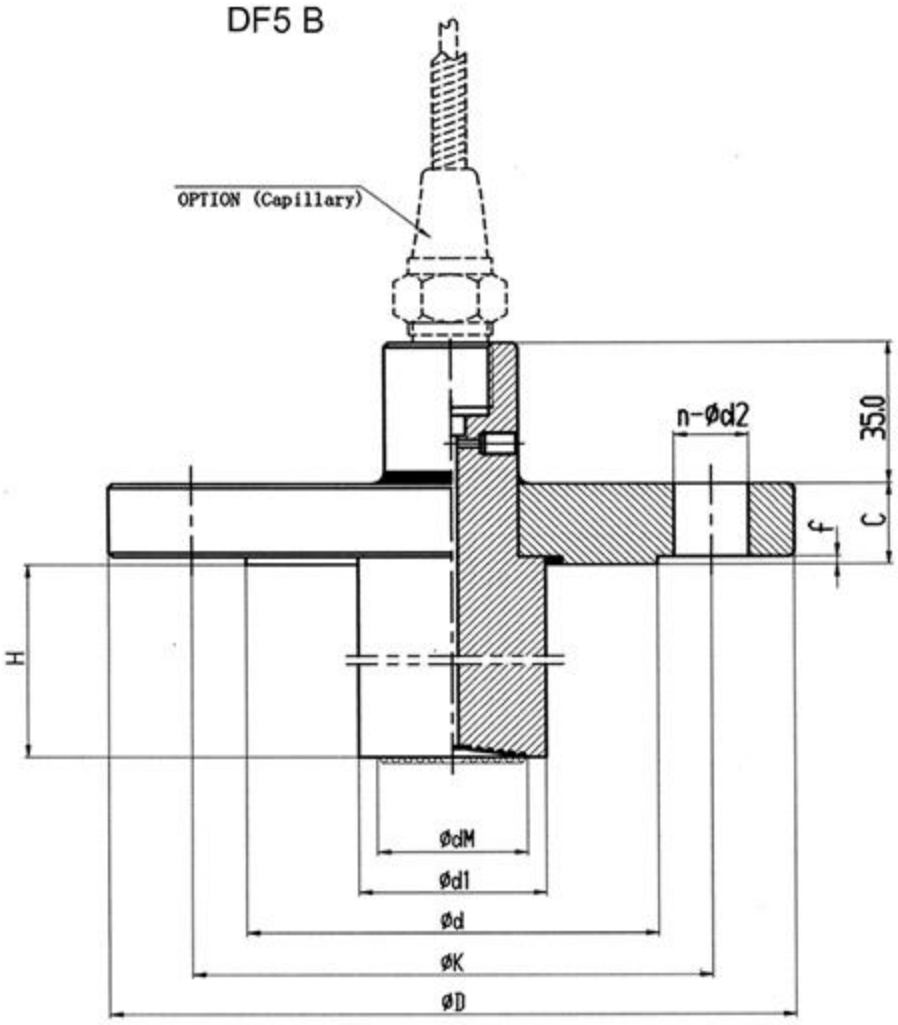
Specifications

- Range: 0-0,6/0-400 Bar
- Accuracy: ± 1.6%
- Working Temperature: –45..+150℃
- Diaphragm Material: 316L
- Flange material: 304
- Flange standard: ANSI B 16.5
  DIN 2501
- Extension: 0–300mm

DF5-B

Dimensions (mm.)

DF5 B



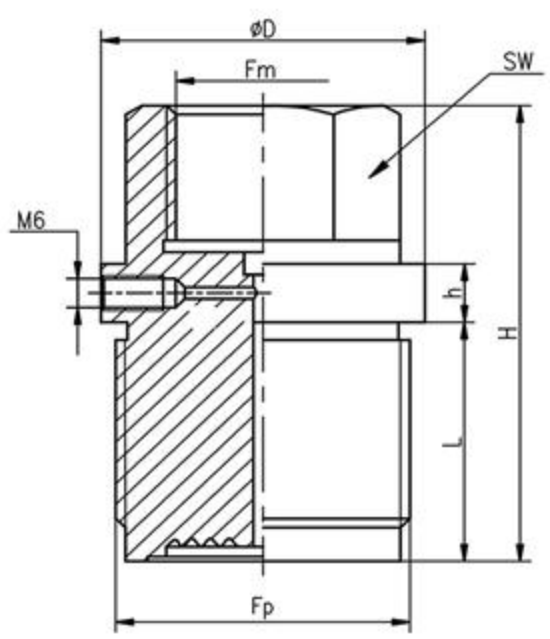
Flange [ANSI B16.5]

DN [in]	PN [bar]	(DIMENSION) [mm]							dM	H
		D	C	d2	K	f	d	n		
1 1/2	150	130	22	16	98.5	2	73	4	30	10~150
	300	155	22	22	114.5	1.6	73	4	30	10~150
	600	155	29.5	22	114.5	6.4	73	4	30	10~150
	900/1500	180	39	30	124	6.4	73	4	19	10~150
2	150	150	20	20	120.5	1.6	92	4	36	10~150
	300	165	22.5	20	127	1.6	92	8	36	10~150
	600	165	32	20	127	6.4	92	8	30	10~150
	900/1500	215	45	26	165	6.4	92	8	19	10~150
3	150	190	24	20	152.5	1.6	127	4	49	10~150
	300	210	29	22	168.5	1.6	127	8	36	10~150
	600	210	38.5	22	168.5	6.4	127	8	30	10~150
	900	240	45	26	190.5	6.4	127	8	19	10~150
	1500	270	54.5	33	203	6.4	127	8	19	10~150
	2500	305	72.5	36	228.5	6.4	127	8	19	10~150

Flange (DIN)

DN [mm]	PN [bar]	(DIMENSION) [mm]							dM	H
		D	C	d2	K	f	d	n		
40	10/40	150	18	18	110	2	84	4	30	10~150
	63/100	170	26	22	125	2	84	4	30/19	10~150
50	10/40	165	20	18	125	2	99	4	36/30	10~150
	63	180	26	22	135	2	99	4	19	10~150
	100	195	28	26	145	2	99	4	19	10~150
80	10/16	200	20	18	160	2	132	8	49	10~150
	25/40	200	24	18	160	2	132	8	36/30	10~150
	63	215	28	22	170	2	132	8	19	10~150
	100	230	32	26	180	2	132	8	19	10~150

DF5A DN ≥ 40 DN ≥ 2"



Fp	D	H	h	L	SW
G1 1/2"	70	80	10	50	32
G1 1/4"	52	70	10	45	32
G1"	44	70	10	35	32
G3/4"	42	55	10	25	32

DF6 Sanitary diaphragm seals

Special items

- High temperature: Max 180℃
- Diaphragm material: Hastelloy C, Tantalum,Titanium, Monel, 316L PTFE coated
- Wetted material: 316, 316L
- Gauge Connection: Thread M20*1.5,1/2" NPT
- Filling liquid: As different media, optional
  Fluorocarbon oil, –60..+120℃,
  Food oil –20..+160℃
- Process connection: please refer to next page

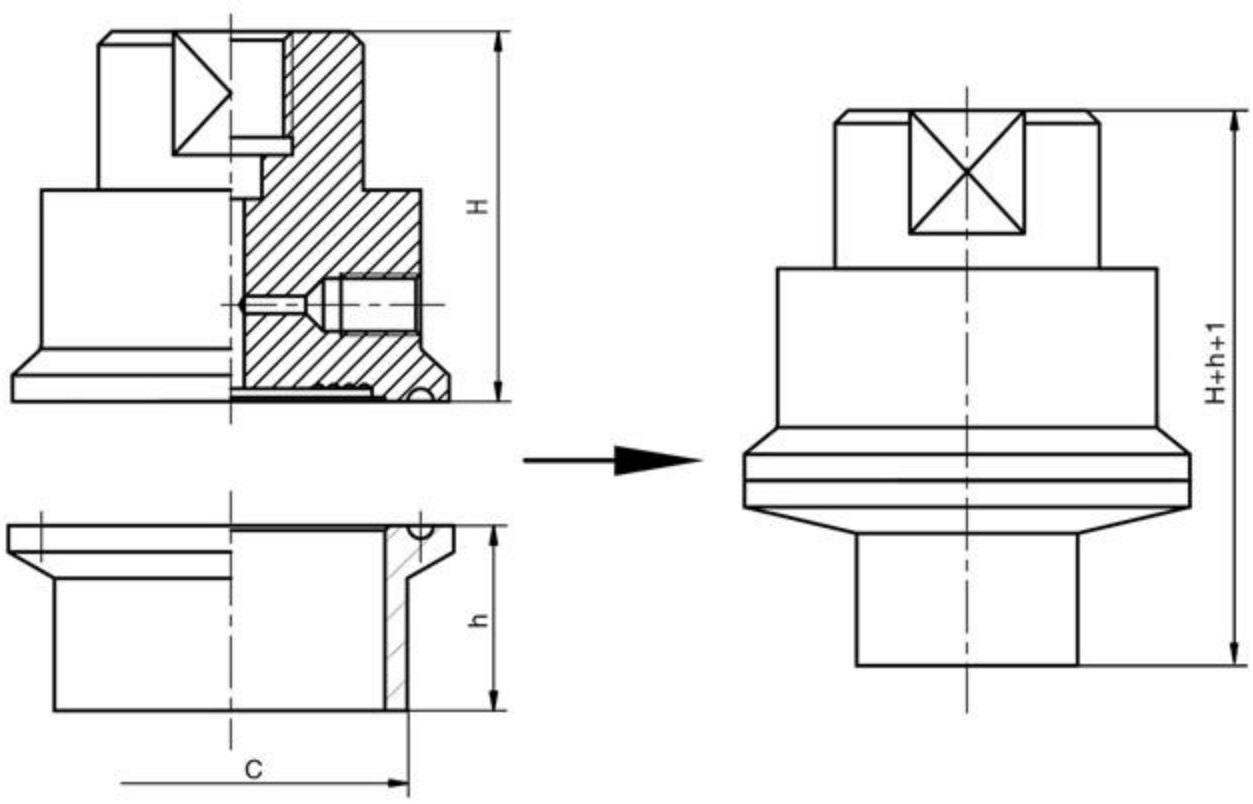
DF7

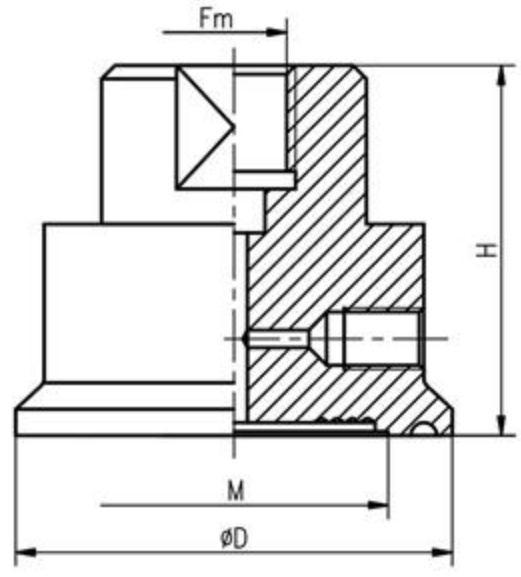
Specifications

- Range: F6: 1-0/0-16 Bar
  F7: 1-0/0-40 Bar
- Accuracy: ±1.6%
- Working Temperature: –45..+150℃
- Diaphragm Material: 316L
- Wetted material: 316+Silicone gasket
- Gauge Connection: Thread M20*1.5,1/2" NPT
- Filling liquid: Glycerine oil
- Process connection: please refer to next page

Dimensions (mm.)

DF6

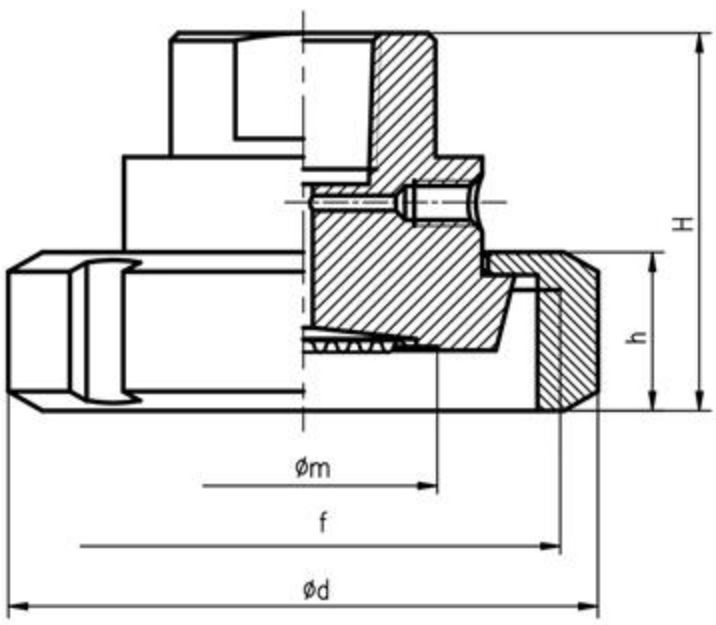




DN	D	H	h	C	M
1"	50.5	42.5	21	25.4	35.5
1.5"	50.5	42.5	21	38.1	35.5
2"	64	42.5	21	50.8	35.5
2.5"	77.5	42.5	21	63.5	58

Dimensions (mm.)

DF7

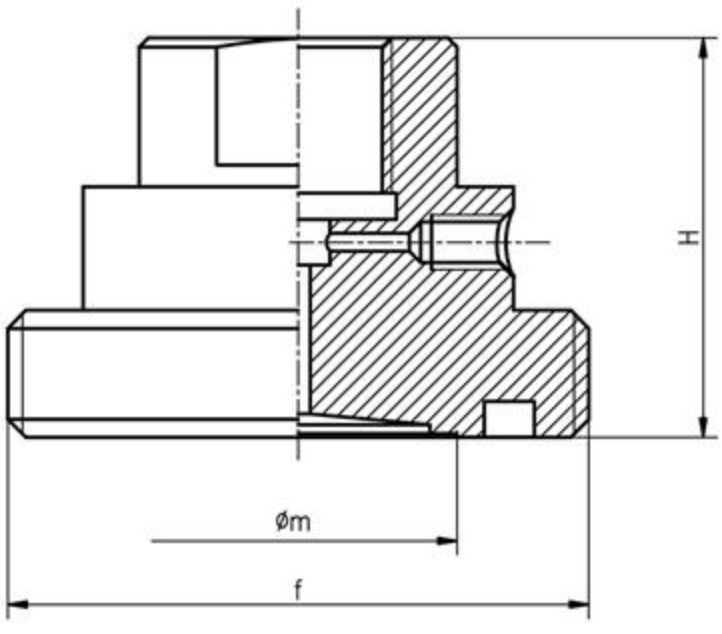


DIN 11851

DN	H	h	d	m	f
25	44	21	63	35	Rd52 × 1/6
32	49	21	68	35	Rd58 × 1/6
40	49	21	76	42	Rd65 × 1/6
50	50	22	90	50	Rd78 × 1/6
65	52	24	110	58	Rd95 × 1/6

SMS 681

DN	H	h	d	m	f
1.5"	51	23	72	35	Rd60 × 1/6
2"	51	23	82	50	Rd70 × 1/6
2.5"	51	25	98	58	Rd85 × 1/6



DIN 11851

DN	H	m	f
25	46	35	Rd52 × 1/6
32	46	35	Rd58 × 1/6
40	46	35	Rd65 × 1/6
50	46	42	Rd78 × 1/6
65	46	58	Rd95 × 1/6

SMS 681

DN	H	m	f
1.5"	46	35	Rd60 × 1/6
2"	46	42	Rd70 × 1/6
2.5"	46	42	Rd85 × 1/6

Diaphragm Seals

DF

DF8 Welded One–piece Diaphragm Seals

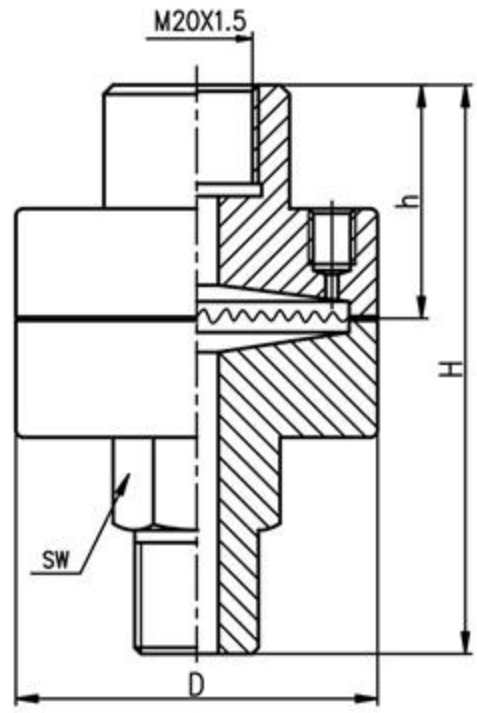
Special items

- High temperature: Max 240℃
- Diaphragm material: Hastelloy C, Tantalum, Monel
- Body material: 316, 316L
- connection: other on request
- Filling liquid: As different media, optional fluorocarbon oil, –60‥+120℃,Food oil –20‥+160℃

Specifications

- Range: DAMH 0-6/0-600 Bar
  DAMM 0-4/0-600 Bar
  DAMS 0-16/0-600 Bar
  DAMG 0-1/0-160 Bar
- Accuracy: ±1.6%
- Working Temperature: –45‥+150℃
- Diaphragm Material: 316L
- Body material: 304
- Connection: Thread 1/2" NPT, R 1/2", M20x1.5
- Filling liquid: Silicone oil

Dimensions (mm.)



Type	D	H	h	SW
Φ34 DAMH	34	54	30	24
Φ58 DAMM	57.1	74	47	24
Φ62 DAMS	62	87	47	24
Φ88 DAMG	82	84	47	24

DF10 In Line Diaphragm Seals

Special items

- High temperature: Max 240℃
- Diaphragm material: Hastelloy C, Tantalum, Titanium, Monel, 316L PTFE coated
- Instrument connection: other on request
- Process connection: Flanged connection
- Filling liquid: As different media, optional fluorocarbon oil , –60..+220℃,Food oil –20 .. +160℃
- Capillary: Maximum length 10m, material 304 covered with 304 armour, other on request
- Hold temperature: Threaded connection, Thread can be made on request

Specifications

- Range: 0-0,6/0-250 Bar
- Accuracy: ± 1.6%
- Working Temperature: –45..+150℃
- Diaphragm Material: 316L
- Wetted material: 304
- Process connection: welded
- Standard: ANSI B36.1
  DIN248
- Filling liquid: Silicone oil

Dimensions (mm.)