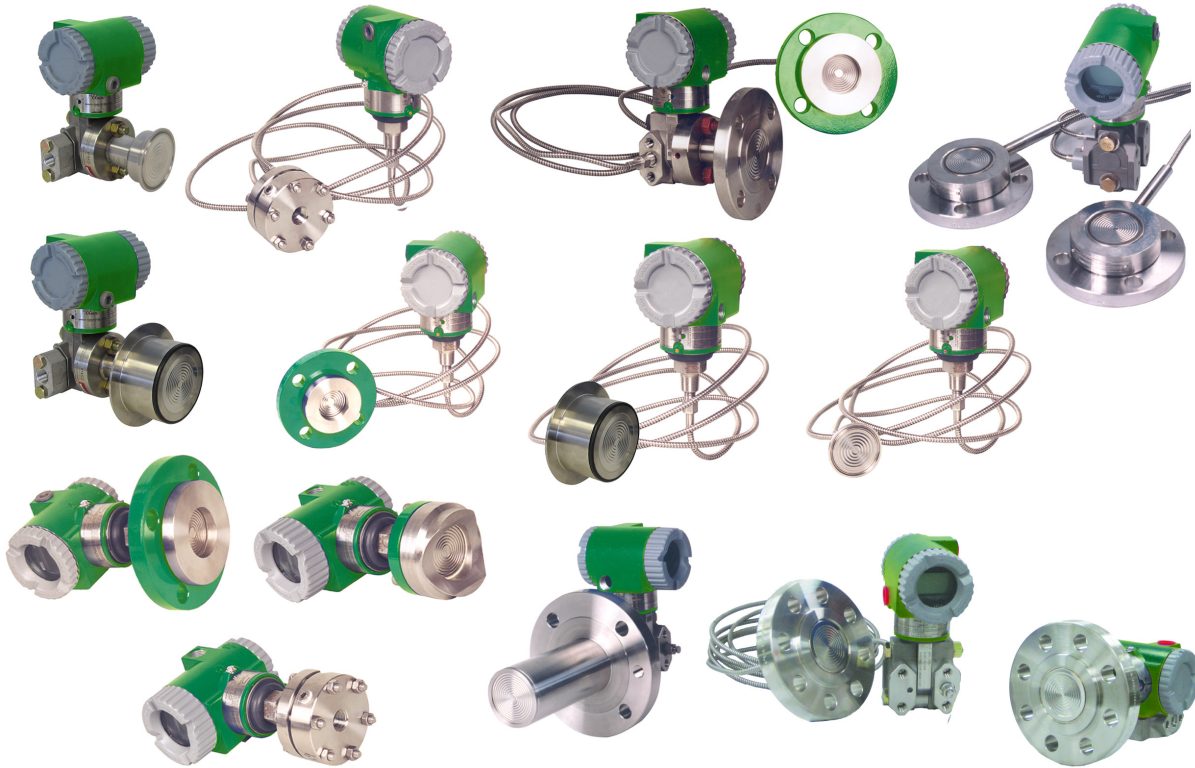


**Diaphragm Seals for Use with Schneider Electric Pressure Transmitters**



*Diaphragm seals are used to isolate a pressure transmitter from the process. A sealed system is used for a process fluid that is sanitary, or may be corrosive, viscous, subject to temperature extremes, toxic, or tend to collect and solidify.*

**FEATURES**

- ▶ Selection of flanged level or flanged remote mount seals with flush or extended diaphragms. Also recessed diaphragm seals for direct or remote mount with flanged, in-line saddle weld, or threaded process connections.
- ▶ Sanitary direct connect or remote mount diaphragm seals that meet FDA requirements. Seals offered with either 32 Ra or 15 Ra surface finish. The 32 Ra finish is applicable to most sanitary industry applications. The 15 Ra finish is ideally applicable to the biopharmaceutical and pharmaceutical industries. Tri-Clamp type connectors are used to help secure the process connections.
- ▶ FDA approved NEOBEE® M-20 fill fluid for sanitary applications.
- ▶ Flanged seals with ANSI, EN1092, or JIS in a variety of sizes and materials (see model code).
- ▶ Seals with threaded process connections from 1/4 to 1 NPT, G1/4 to G1, male and female.
- ▶ In-line, saddle weld seals for 3- or 4-inch process pipes.
- ▶ Numerous seal sizes available depending on the seal model selected.
- ▶ Diaphragms available flush with the flange face; and also available with extensions for flush mounting with the inside surface of the tank.

*Equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising from the use of this material.*

- ▶ Capillary lengths from 1 to 15 m (3 to 49 ft) for remote mount applications. Capillary is 316 SS with flexible armor, and is available with or without a protective coating.
- ▶ A variety of diaphragm materials are offered (see model code selections).
- ▶ Fill fluids accommodate process temperatures up to 300°C (570°F) for sanitary and direct connect seals, and up to 400°C (750°F) for remote capillary connected seals.

**Table 1. Equivalents for Legacy Pressure Seal Model Codes (a)**

Legacy Model Code	Description	New Model Code (b)	RJG (c)/ WIKA Model	WIKA Model
PSFAD	Flanged attached direct	DS-N	FWOT - Through Bolt	n/a
		DS-M	FWOS - Stud Bolt	990.41
PSFAR	Flanged attached remote	DS-N	FWOT - Through Bolt	n/a
		DS-M	FWOS - Stud Bolt	990.41
PSFES	Flanged extended seal	DS-H	FWE - Extended Seal	990.29
PSFFD	Flanged flush direct	DS-F	FWGO - One Piece	990.27
		DS-G	FWGM - Multi Piece	990.FR (US only)
PSFFR	Flanged flush remote	DS-F	FWGO - One Piece	990.27
		DS-G	FWGM - Multi Piece	990.FR (US only)
PSFLT	Flange level direct connect for DP and MV transmitters only	DS-F	FWGO - One Piece	990.27
		DS-G	FWGM - Multi Piece	990.FR (US only)
		DS-H	FWE - Extended Seal	990.29
PSFPS	Pancake	DS-J	FWP - Pancake	990.28
PSISD	Inline saddle direct	DS-L	PWJ - Saddle Seal	991.ZA (US only)
PSISR	Inline saddle remote	DS-L	PWJ - Saddle Seal	991.ZA (US only)
PSSCR	Sanitary Tri-Clamp remote	DS-C	CHL - Sanitary Tri-Clamp	990.22
PSSCT	Sanitary Tri-Clamp direct (DP)	DS-C	CHL - Sanitary Tri-Clamp	990.22
PSSSR	Sanitary tank spud remote	DS-P	CHK - Tank Spud	n/a
PSSST	Sanitary tank spud direct (DP)	DS-P	CHK - Tank Spud	n/a
PSTAD	Threaded attached direct	DS-K	TWA - Threaded Seal	990.10
				990.40
PSTAR	Threaded attached remote	DS-K	TWA - Threaded Seal	990.10
				990.40

- a. There is not a direct correlation from legacy models to new diaphragm seals. All models can be direct mounted (bolted) to DP and GP biplanar transmitters, except for Pancake (DS-J). All diaphragm seal models can be direct connected (threaded) to AP and GP styles except for Pancake (DS-J) and Sanitary (DS-C and DS-P).
- b. In addition, model code DC- is used to specify instrument connection, seal orientation, capillary length and type, and fill fluid for all diaphragm seal models.
- c. RJ Global - WIKA USA Diaphragm Seal Operations.

## GENERAL DIAPHRAGM SEALS SPECIFICATIONS

### INTRODUCTION

Sealed measurement systems, comprising the transmitter sensing element, diaphragm seal, and connecting tubing (as applicable), are evacuated and filled with an appropriate fill fluid that transmit pressure changes. A diaphragm seal assembly can be for flanged level applications, direct connected to the transmitter, or remote mounted using an interconnecting capillary.

### PROCESS CONNECTIONS WITH DIRECT CONNECT OR REMOTE MOUNT SEALS

Direct connect or remote mount seals are offered with flanged, threaded, or in-line welded process connections. See Table 1 for seal models.

### SANITARY SEALS

Sanitary seals are used in food and dairy product applications and meet FDA and United States Public Health Service, Dairy Industry Committee requirements. A seal surface finish of 32 Ra is offered for use in most sanitary industry applications. The seal surface can also be polished to 15 microinches for use in industries such as biopharmaceutical and pharmaceutical. Tri-Clamp type connectors are used to attach the sanitary end connection to the process or tank spud.

### FLUSH DIAPHRAGM SEALS

These seals are offered with flanged and sanitary process connections. They minimize pockets or cavities where process liquid can collect, and are available in many corrosion resistant materials.

### RECESSED DIAPHRAGM SEALS

Recessed diaphragm seal assemblies are available in flanged, threaded, and in-line weld configurations. Numerous process-wetted metal selections are offered.

### EXTENDED DIAPHRAGMS

Flush seals with flanged process connections can be provided with extended diaphragms. This allows the sensing diaphragm to extend through the mounting nozzle and be flush with the inside surface of the tank, helping eliminate pockets or cavities. Various diaphragm materials and extension lengths up to 250 mm (10 in) are offered, depending on the seal model selected.

### REMOTE MOUNT SEAL ORIENTATION TO MATCH APPLICATION REQUIREMENTS

- ▶ Dual Seal Version - Balanced
- ▶ Single Seal - High Pressure Side
- ▶ Single Seal - Low Pressure Side

### REDUCED TEMPERATURE EFFECT

Optimum temperature performance is achieved when both the seal diaphragm stiffness and system fill fluid volume are at their least (see "Capillary Selection" on page 4). Larger diaphragms have lower stiffness and are therefore less affected by temperature. With small pressure measurement spans, select the largest diaphragm size that can be reasonably used.

### CHOICE OF FILL FLUIDS TO MEET PROCESS REQUIREMENTS

When selecting a seal fill fluid, first consider the temperature capability of the fluid and compatibility with the process in the event that a diaphragm does not perform correctly. Several silicone fluids are offered that cover various temperature ranges. For processes with strong oxidizing agents such as chlorine or oxygen, select the inert fill fluid. Inert fill is also suitable for extreme cold temperatures. For sanitary applications, NEOBEE M-20 fill is offered.

### CAPILLARY SELECTION

Capillaries transmit pressure from the seal to the pressure measurement device.

#### Choosing the Right Capillary

Two factors to consider when choosing capillaries are *length* and *inside diameter*. Both of these can have an effect on overall performance in the area of temperature and time response.

#### Capillary Length

The longer the capillary, the more volume exists between the diaphragm seal and the transmitter. Capillary length has a direct correlation with the response time.

Depending on the ambient conditions, temperature swing also affects the accuracy and response time of the system based on the length of capillary.

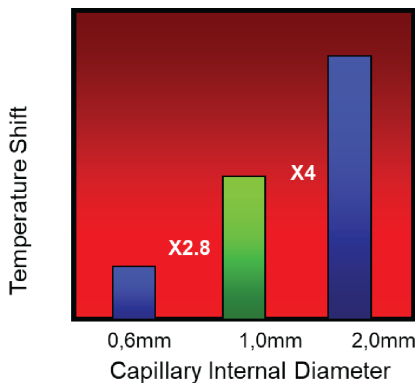
Examples:

- ▶ Direct sunlight causes the fill fluid inside a long capillary to expand, causing an issue with accuracy.
- ▶ On a cold day, a long capillary shrinks the fill fluid and makes it more viscous, which delays the response of the signal; the shrinkage can even be enough to bottom out the diaphragm. Accuracy of the system is also affected.

#### Capillary Inside Diameter (I/D)

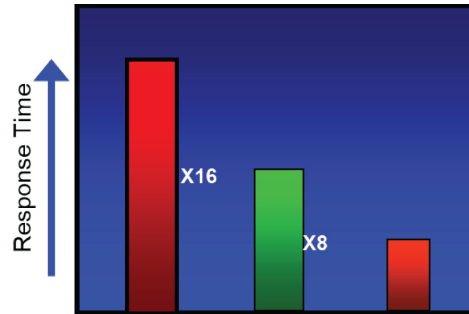
- ▶ The shorter the capillary and greater the internal diameter, the higher the temperature transfer will be.

Figure 1. Capillary I/D vs Temperature Shift



- ▶ The longer the capillary and smaller the internal diameter, the longer the response time will increase.

Figure 2. Capillary I/D vs Response Time



### FLUSHING/CALIBRATION RING

#### Flushing Ring/Flushing Port

Flushing ports are fabricated with one or two 1/4 or 1/2 NPT threaded connections. The ports facilitate purging or flushing of the process cavity, or can be used as ports for calibration. The flushing ring can be made of different solid materials.

Figure 3. Flushing Ring/Flushing Port



**DIAPHRAGM SEAL ORDERING INSTRUCTIONS**

These diaphragm seals are used with pressure transmitters. Although seals are shipped assembled to the transmitter, you must order them separately. Each transmitter model code has a structure code, which defines whether a transmitter is to be ordered without seals, with remote mount seals, or with direct connect seals. Table 2 identifies the applicable transmitter PSS.

**Table 2. PSS Documents for Pressure Transmitters**

Performance Tier	PSS
Value Performance	PSS 2A-1S05A
Advanced Performance	PSS 2A-1S10A
Premium Performance	PSS 2A-1S50A

After making the required structure code selection in the transmitter model code, select the applicable diaphragm seal model code and diaphragm seal common model code from this document.

- ▶ The diaphragm seal model code begins with “DS-” and refers to the specific diaphragm seal model.
- ▶ The diaphragm seal common model code is used in conjunction with all diaphragm seal model codes. It begins with “DC-” and refers to the instrument connection, capillary size and type, and fill fluid.

Therefore, a transmitter with seals comprises a transmitter model code, diaphragm seal model code (DS-), and diaphragm seal common model code (DC-).

**DIAPHRAGM SEAL COMMON MODEL CODE (DC-)**

The diaphragm seal common model code is used in conjunction with all diaphragm seal model codes. It begins with “DC-” and refers to the instrument connection, capillary size and type, and fill fluid. For each DS- model code you specify, you must also specify the DC- code.

**MODEL CODE – COMMON DIAPHRAGM SEAL**

Description	Model
Diaphragm Seal Instrument Connection Capillary and Fill Fluid	DC
<b>Instrument Connection</b>	
Direct 1/2 NPT Female (Seal) (a) (b) (c)	-D
Remote Welded Capillary (Instrument and Seal) (d)	-R
Bolted (DP Style, IMV and Gauge Biplanar) (a) (b) (e)	-B
Bolted Sanitary Only (with Model Code DS-C or DS-P only) (a) (e)	-S
<b>Seal Orientation</b>	
High and Low Side (DP Style; IMV) (f)	A
High Side Only (e)	B
Low Side Only (e)	C
IGP**S, IAP**S (1/2 NPT)	D
<b>Capillary ID</b>	
None (a)	0
1 mm (0.039 inches)	3
1.5 mm (0.059 inches) (f) (g)	4
<b>Capillary Length and Type</b>	
None (a)	00
1.0 m (3 ft) 316 SS Flexible Armor	AA
2.0 m (6 ft) 316 SS Flexible Armor	AB
3.0 m (10 ft) 316 SS Flexible Armor	AC
4.0 m (13 ft) 316 SS Flexible Armor	AD
5.0 m (16 ft) 316 SS Flexible Armor	AE
6.0 m (20 ft) 316 SS Flexible Armor	AF
7.0 m (23 ft) 316 SS Flexible Armor	AG
8.0 m (26 ft) 316 SS Flexible Armor	AH
9.0 m (30 ft) 316 SS Flexible Armor	AJ
10.0 m (33 ft) 316 SS Flexible Armor	AK
11.0 m (36 ft) 316 SS Flexible Armor	AL
12.0 m (38 ft) 316 SS Flexible Armor	AM
13.0 m (43 ft) 316 SS Flexible Armor (g)	AN
14.0 m (46 ft) 316 SS Flexible Armor (g)	AP
15.0 m (49 ft) 316 SS Flexible Armor (g)	AQ
1.0 m (3 ft) 316 SS Flexible Armor, Protective Coat	BA
2.0 m (6 ft) 316 SS Flexible Armor, Protective Coat	BB
3.0 m (10 ft) 316 SS Flexible Armor, Protective Coat	BC
4.0 m (13 ft) 316 SS Flexible Armor, Protective Coat	BD
5.0 m (16 ft) 316 SS Flexible Armor, Protective Coat	BE
6.0 m (20 ft) 316 SS Flexible Armor, Protective Coat	BF
7.0 m (23 ft) 316 SS Flexible Armor, Protective Coat	BG
8.0 m (26 ft) 316 SS Flexible Armor, Protective Coat	BH
9.0 m (30 ft) 316 SS Flexible Armor, Protective Coat	BJ
10.0 m (33 ft) 316 SS Flexible Armor, Protective Coat	BK
11.0 m (36 ft) 316 SS Flexible Armor, Protective Coat	BL
12.0 m (38 ft) 316 SS Flexible Armor, Protective Coat	BM
13.0 m (43 ft) 316 SS Flexible Armor, Protective Coat (g)	BN
14.0 m (46 ft) 316 SS Flexible Armor, Protective Coat (g)	BP
15.0 m (49 ft) 316 SS Flexible Armor, Protective Coat (g)	BQ

## MODEL CODE – COMMON DIAPHRAGM SEAL

## MODEL CODE – COMMON DIAPHRAGM SEAL (CONTINUED)

Description	Model
<b>Fill Fluid - Diaphragm Seal</b>	
DC 200-10	A
DC 200-50	B
DC 200-350 (Food Grade)	C
DC 550	D
DC 710	E
Silicone PD5/KN 17 (Low Temp)	F
TMC 704	G
TMC 705	H
NEOBEE M-20 (Food Grade)	J
SYLTHERM 800	K
SYLTHERM XLT (Low Temp)	L
Halocarbon 1.8 (Low Temp Inert)	M
Halocarbon 6.3 (Inert)	N
Glycerin (Food Grade)	P
Therminol 66	Q
Fluorolube FS-5 (Inert)	R
Mineral Oil (Food Grade)	S
Krytox 1506	T
Propylene Glycol	U
Glycerin/Water (Food Grade)	V
<b>Optional Selections</b>	
Degrease	-D
Oxygen Service Clean (inert fill only; no direct connect threaded) (c) (i)	-S

- a. Capillary ID None (selection 0) requires Instrument Connection Direct, Bolted, or Bolted Sanitary (selection -D, -B, or -S).
- b. Fill Fluids Glycerin 200-350, DC 550, and DC 710 (selections C, D, and E) only available with Instrument Connections Direct, Bolted (selections -B, -D).
- c. Oxygen Service Clean (option -S) not available with Instrument Connection Direct (selection -D).
- d. Instrument Connection Remote (selection -R) available with all Seal Orientations.
- e. Instrument Connection Bolted and Bolted Sanitary (selections -B and -S) available with Seal Orientation High Side or Low Side (selection B or C).
- f. Seal Orientation High and Low Side (selection A) only available with Capillary ID 1.5 mm (selection 4).
- g. Capillary Length and Type 13 m, 14 m, and 15 m (selections AN, AP, AQ, BN, BP, BQ) not available with Capillary ID 1.5 mm (selection 4).
- h. Fill Fluid TMC 704 (selection G) only available with Capillary ID 1.5 mm (selection 4) and Capillary Length 23 feet or less and Fill Fluid TMC 704 only available when Instrument Connection is Direct 1/2 NPT (Model D) or Bolted (DP style, IMV and Gage Biplanar) (Model B) and not available with Instrument Connection Bolted Sanitary (Model S) or Instrument Connection is Remote (Model R) with Capillary ID 1.5mm (Model 4) and Capillary length 23 feet or less and Instrument Connection Direct (selection -D).
- i. Oxygen Service Clean (option -S) available with fill fluids DC 200-350, NEOBEE M-20, Halocarbons 1.8 and 6.3, Glycerin, Fluorolube FS-5, Mineral Oil, and Glycerin/Water (selections C, J, M, N, P, R, S, V).

FLANGED DIAPHRAGM SEALS - MODELS DS-F, DS-G, DS-H, DS-J, DS-M, DS-N

Figure 4. DS-F (One-Piece Flush Flange)

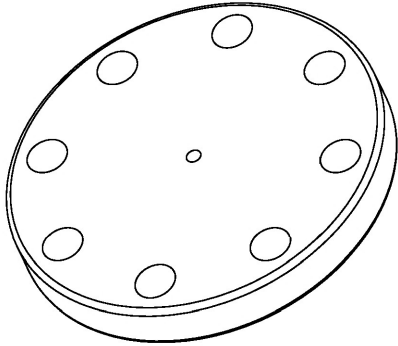


Figure 7. DS-J (Pancake Diaphragm Seal)

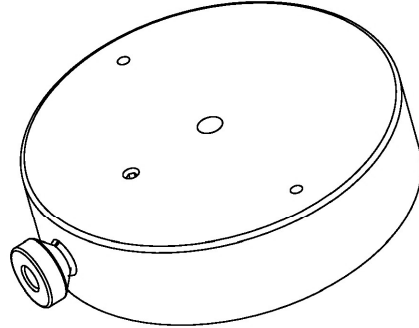


Figure 5. DS-G (Multi-Piece Flush Flange)

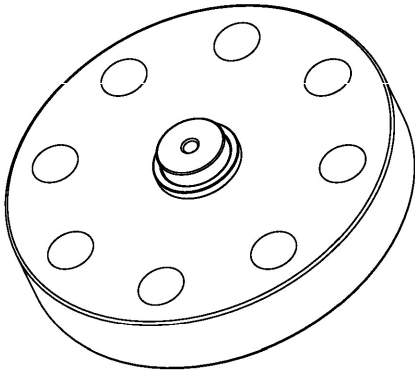


Figure 8. DS-N (Flanged Diaphragm Seal, Through Bolt)

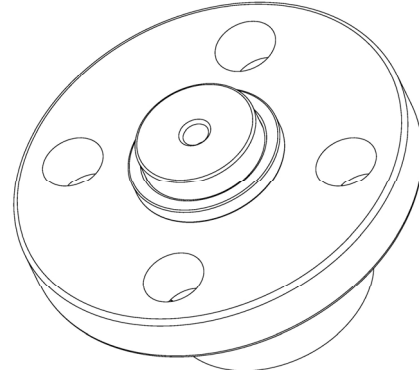


Figure 6. DS-H (Flanged Extended Diaphragm Seal)

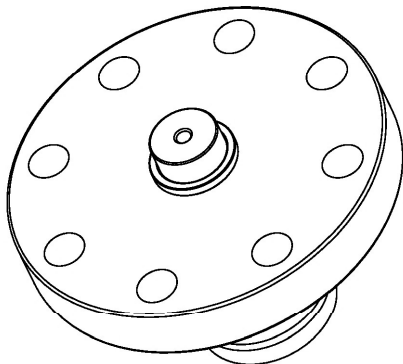
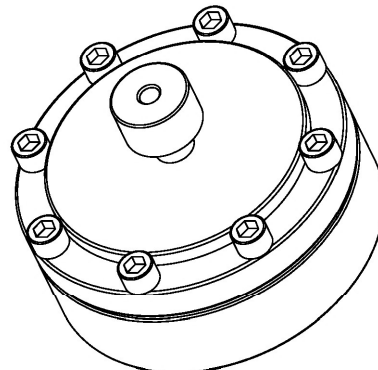


Figure 9. DS-M (Flanged Diaphragm Seal, Stud Bolt)





## Flange Diaphragm Seal Selection

### One-Piece Flush Flange (DS-F)

See Figure 4. This single-piece design has the diaphragm welded directly to a flange. This design can have the exotic diaphragm material extend to cover all raised face connections (including serrated and smooth). If a full face serration is required, in which the serration extends to the edge of the flange, then exotic flange materials are used (e.g., nickel alloy equivalent to Hastelloy® C276<sup>(1)</sup>, Monel 400, Inconel 625, etc.). The one-piece construction keeps material cost at a minimum, especially for smaller flange sizes.

### Multi-Piece Flush Flange (DS-G)

See Figure 5. The multi-piece model is made up of a flange ring, a face plate, and an insert so that the flange can spin freely. This design is favorable on high hub connection types such as RTJ, tongue and groove, etc. The spinning flange allows ease of aligning bolt holes in the field, especially on large flange sizes.

### Extended Seal (DS-H)

See Figure 6. The extended seal has a process wetted barrel that extends into the tank. This design is used to reduce dead spaces in tank walls and pipe schedules. The extension is normally made with the same material as the diaphragm itself; however, exceptions are made based on the application.

### Pancake Seal (DS-J)

See Figure 7. This seal has a side instrument connection, and the raised face process connection can be adaptable to its respective size. The 3" pancake seal can be used with any 3" backing flanges (150 - 2500#). This makes the seal very versatile.

### Flanged Offline Through Bolt (DS-N)

See Figure 8. The diaphragm is recessed behind a lower housing so the outside diameter of the diaphragm can go to the bolt circle of the flange. The larger the diaphragm, the smaller the pressure that can be detected, and the more accurate the pressure reading.

The flange is also free-spinning for easier installation. The diaphragm, lower housing, and a process gasket are process wetted.

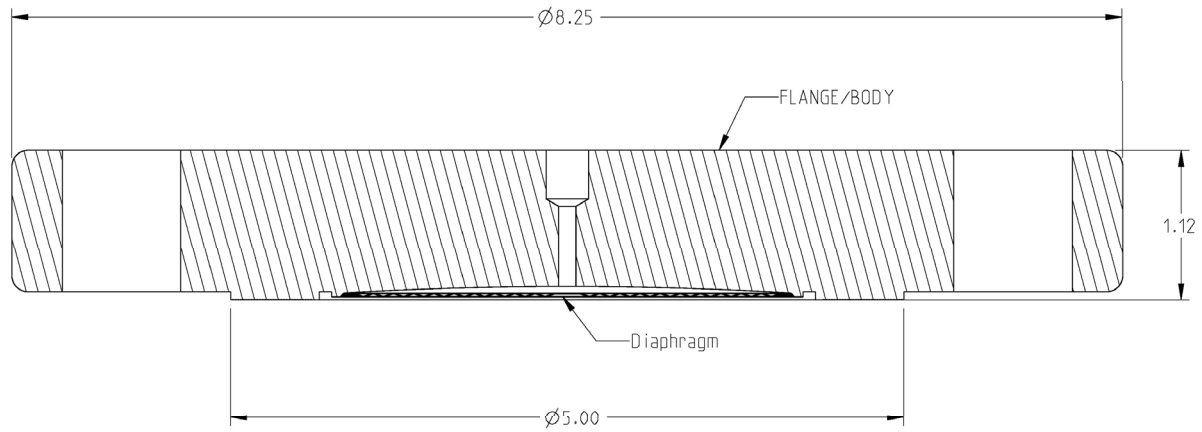
### Flanged Offline Stud Bolt (DS-M)

See Figure 9. The bolt holes and raised face are machined into the lower housing so that the diaphragm can extend out beyond the bolt circle. This allows a diaphragm to fit in a very small flange connection to measure low pressure ranges. The diaphragm, lower housing, and a process gasket are process wetted.

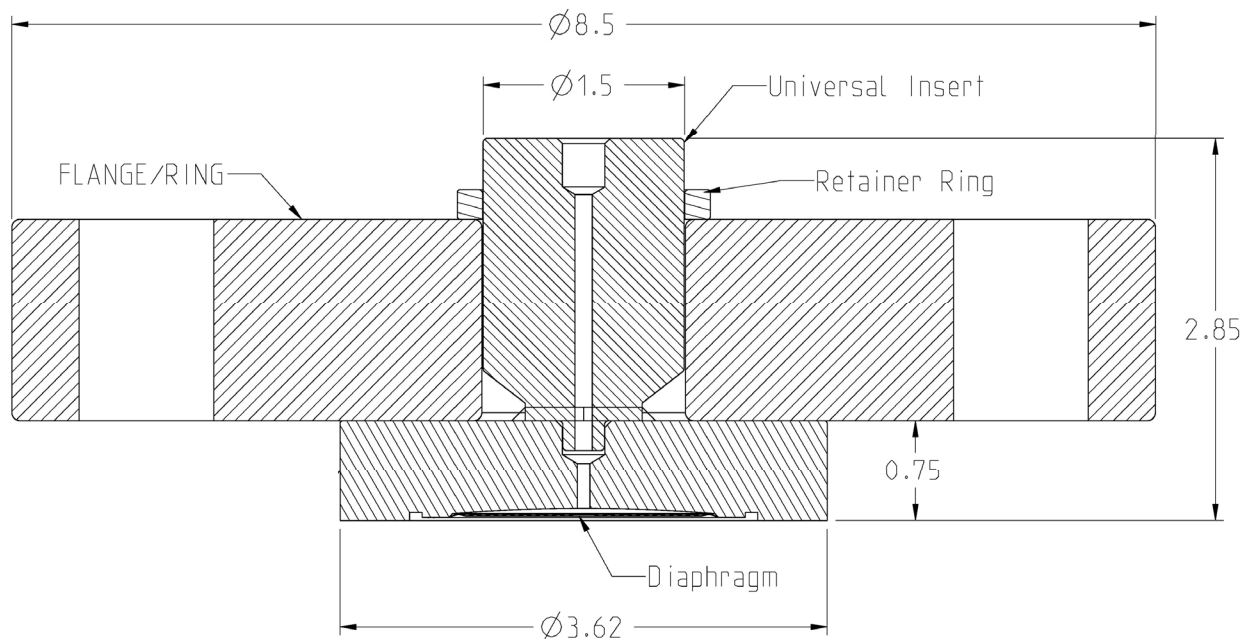
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1. Hastelloy is a registered trademark of Haynes International, Inc.

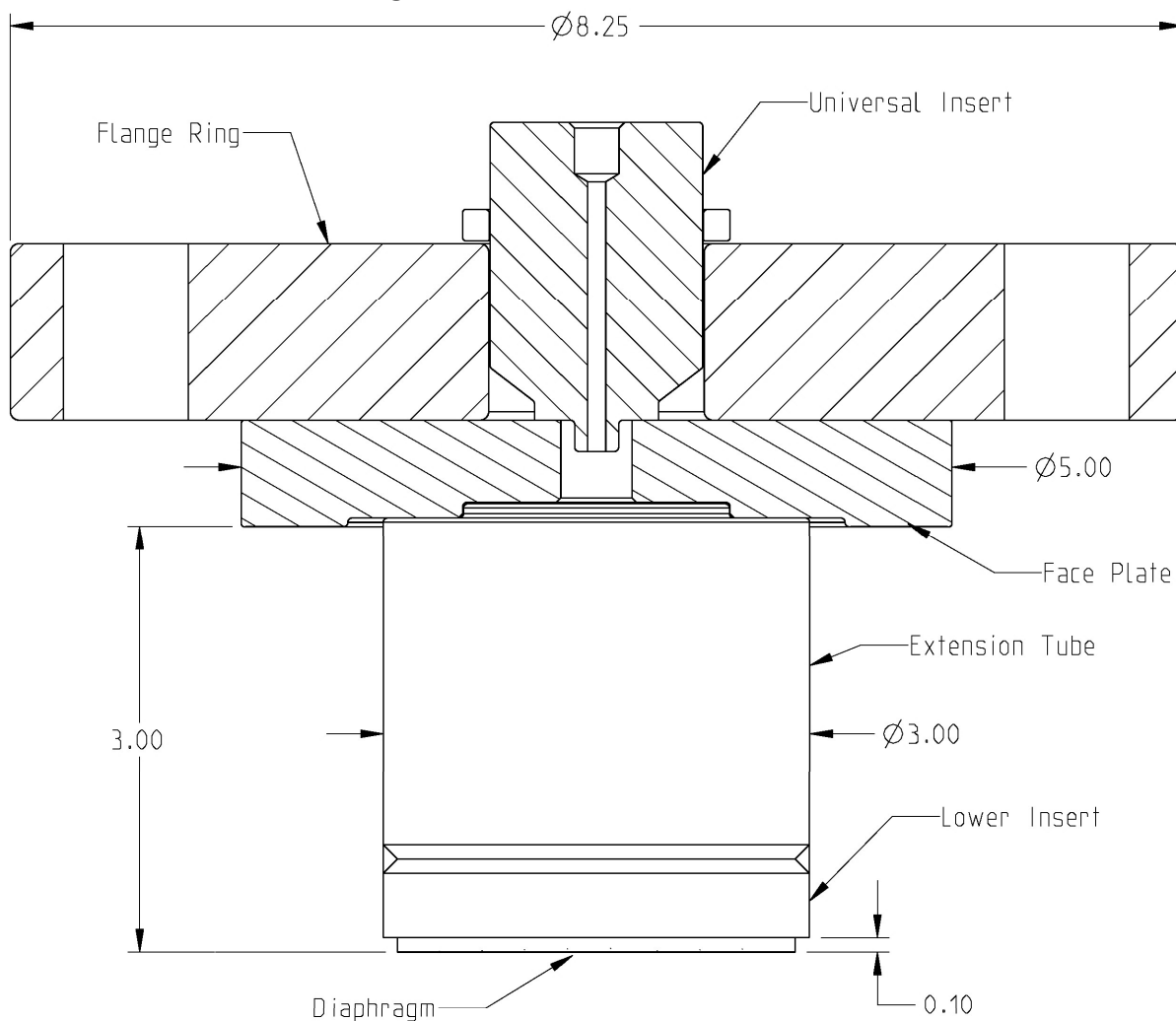
**DS-F Nominal Dimensions, Flanged Flush One Piece, ASME 3"-300# RF**



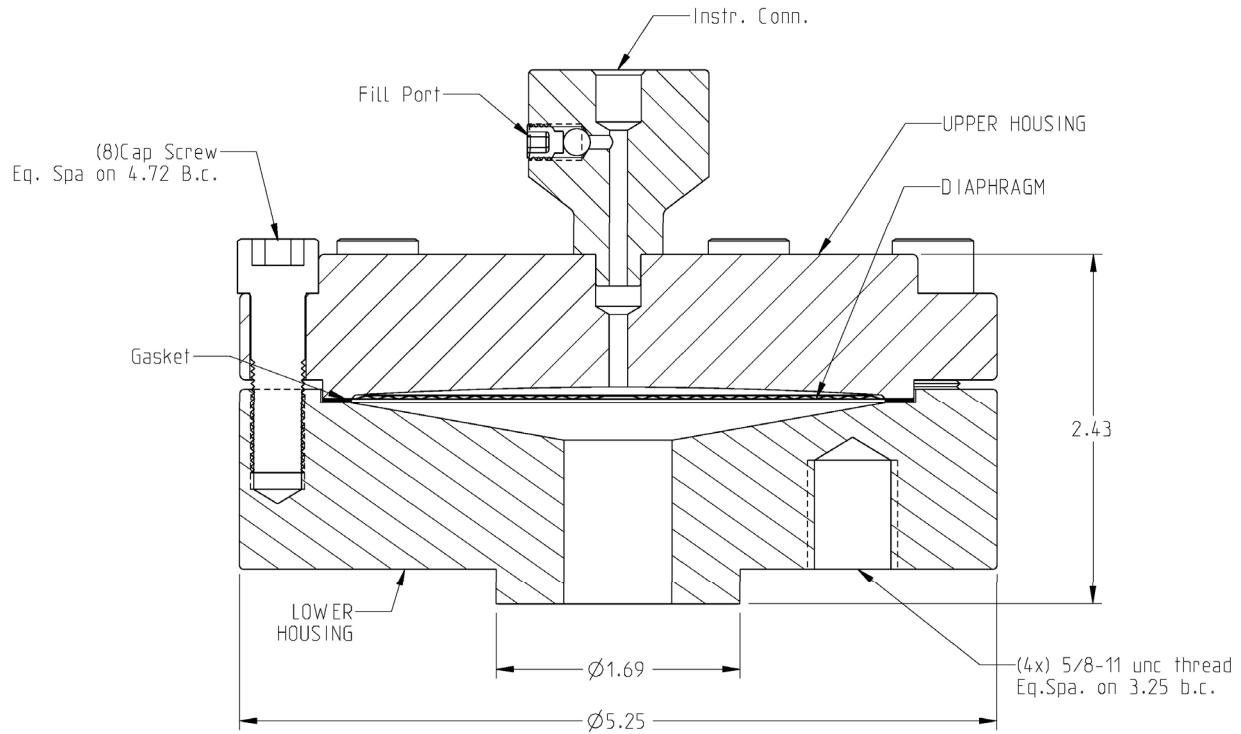
**DS-G Nominal Dimensions, Flanged Flush Multi Piece, ASME 2"-900/1500# RF**



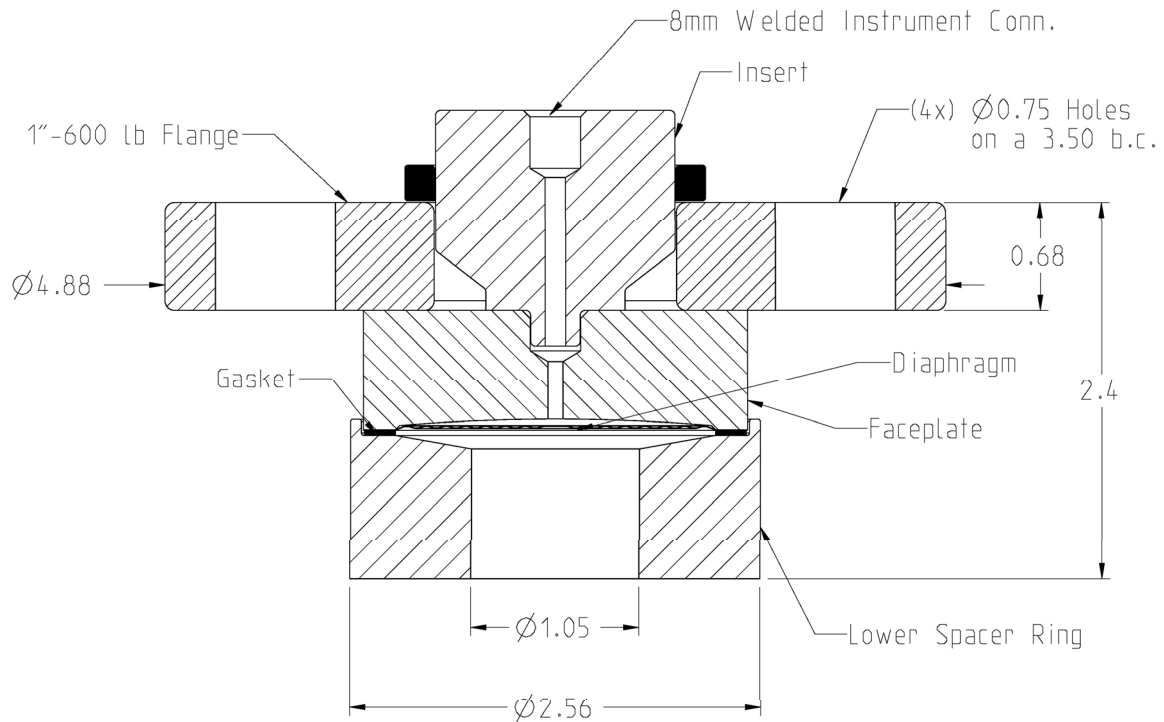
DS-H Nominal Dimensions, Flanged Extended, 3"-600# RF with 3" OD and 3.00" Extension



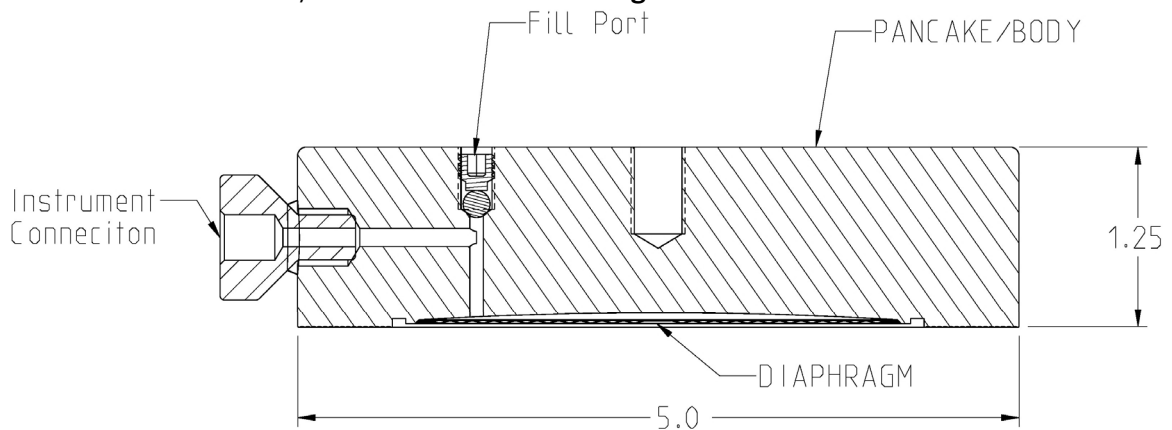
**DS-M Nominal Dimensions, Flanged Offline Stud Bolt, 4.1" Diaphragm 3/4" 600# RF with Flat Gasket, No Flush**



**DS-N Nominal Dimensions, Flanged Offline Through Bolt, 2.4" Diaphragm 1" 600# RF with Flat Gasket, No Flush**



**DS-J Nominal Dimensions, Pancake Seal for 3" Flanges**



### Ambient Temperature Effect - Transmitter with Flanged Seal

Table 3. Total Effect for a 28°C (50°F) Change within Normal Operating Conditions

Transmitter Span Limit Code (a)	Total Ambient Temperature Effect for Transmitters with:
	Electronics Versions “-T”, “-F”, and “-V” (b)
B and C	$\pm(0.03\% \text{ URL} + 0.060\% \text{ Span} + \text{“X”})$
D only	$\pm(0.05\% \text{ URL} + 0.045\% \text{ Span} + \text{“X”})$
E only	$\pm(0.08\% \text{ URL} + 0.025\% \text{ Span} + \text{“X”})$

a. Diaphragm seals are not applicable to transmitter Span Limit Code A.

b. URL, Span, and “X” must be in identical units. See Table 4 for Values of “X”.

Table 4. Values of “X” for Ambient Temperature Effect Specifications

Flange Size		Value of “X” for Transmitter with a Flanged Seal (a)			
		with a Flush Diaphragm		with an Extended Diaphragm	
mm	in	mmH <sub>2</sub> O	inH <sub>2</sub> O	mmH <sub>2</sub> O	inH <sub>2</sub> O
50	2	38	1.5	125	5
80	3	13	0.5	50	1.9
100	4	Not Applicable	Not Applicable	13	0.5

a. Values listed are with seals filled with silicone DC200 or Inert fill fluids.

MODEL CODE – DS-F DIAPHRAGM SEALS

Description	Model
Flanged Flush Diaphragm Seal (One Piece Construction)	DS-F
<b>Process Size (see Table 5)</b>	
1 inch (ASME) (a)	1
1.5 inch (ASME) (a)	H
2 inch (ASME) (a) (b)	2
3 inch (ASME) (a) (c)	3
4 inch (ASME) (a) (d)	4
EN DN25 (EN 1092) (e)	A
EN DN40 (EN 1092) (e)	B
EN DN50 (EN 1092) (e)	C
EN DN80 (EN 1092) (e)	D
EN DN100 (EN 1092) (e)	E
JIS DN25 (JIS) (f)	F
JIS DN40 (JIS) (f)	G
JIS DN50 (JIS) (f)	J
JIS DN80 (JIS) (f)	K
JIS DN100 (JIS) (f)	L
<b>Flange Rating</b>	
ASME Class 150 (ASME)	A
ASME Class 300 (ASME)	B
ASME Class 600 (ASME)	C
ASME Class 900 (ASME)	D
ASME Class 1500 (ASME)	E
ASME Class 2500 (ASME)	F
EN PN10 (EN 1092)	G
EN PN16 (EN 1092)	H
EN PN25 (EN 1092)	J
EN PN40 (EN 1092)	K
EN PN63 (EN 1092)	L
EN PN100 (EN 1092)	M
10K (JIS)	N
16K (JIS)	P
20K (JIS)	Q
<b>Diaphragm Diameter (see Table 5)</b>	
1.3 inch	1
1.9 inch	2
2.5 inch	3
3.5 inch	7
<b>Sealing Face</b>	
RF (Raised Face) 125...250 AA (ASME)	A
RFSF (Raised Face Smooth Finish) (ASME)	B
Flat Face 125...250 AA (ASME) (g)	C
Flat Face Smooth Finish (ASME) (g)	D
Form B1 (EN 1092)	F
Form B2 (EN 1092)	G
RF (Raised Face) 125...250 AA (JIS)	H
RFSF (Raised Face Smooth Finish) (JIS)	J
<b>Flange Material</b>	
Stainless Steel (316L) UNS S31603	A
Nickel Alloy C-276 UNS N10276 (h)	E
Monel 400 UNS N04400 (h)	K
Titanium Grade 2 UNS R50400 (h)	X
Duplex 2205 UNS S31803 (h)	Q
Super Duplex 2507 UNS S32750 (h)	R

MODEL CODE – DS-F DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Sealing Face Material (i)</b>	
Stainless Steel (316L) UNS S31603	A
Carpenter 20 UNS N08020	D
Nickel Alloy C-276 UNS N10276	E
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy B-4 UNS N10629	G
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Monel 400 UNS N04400	K
Titanium Grade 4 UNS R50700	L
Zirconium 702 UNS R60702	M
Nickel UNS N02200	N
Tantalum UNS R05200	P
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
<b>Diaphragm Material (i)</b>	
Stainless Steel (316L) UNS S31603	A
Carpenter 20 UNS N08020	D
Nickel Alloy C-276 UNS N10276	E
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy B-4 UNS N10629	G
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Monel 400 UNS N04400	K
Titanium Grade 4 UNS R50700 (j) (k) (l)	L
Zirconium 702 UNS R60702 (k) (l)	M
Nickel UNS N02200	N
Tantalum UNS R05200 (j) (m)	P
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
<b>Flushing Connection (n)</b>	
None (o)	Z
1 x 1/4 NPT Female (p)	2
2 x 1/4 NPT Female (q)	5
1 x 1/2 NPT Female (p)	3
2 x 1/2 NPT Female (q)	6
<b>Sealing Screw on Flushing Connection (r)</b>	
None (n) (o)	Z
1 Sealing Screw (p)	1
2 Sealing Screws (q)	2
<b>Lower Part Material (i) (r)</b>	
None (o)	4
Stainless Steel (316L) UNS S31603 (m)	A
Carpenter 20 UNS N08020	D
Nickel Alloy C-276 UNS N10276 (m)	E
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy B-4 UNS N10629	G
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Monel 400 UNS N04400	K
Titanium Grade 4 UNS R50700	L
Zirconium 702 UNS R60702	M
Nickel UNS N02200	N
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R



MODEL CODE – DS-F DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Wetted Parts Coating</b>	
No Coating	Z
PFA Coating 0.15 mm (Antistatic) (j)	B
<b>Optional Selections</b>	
NACE MR0103/MR0175 (l)	-N
Material Certification per EN 10204 3.1	-M
Pressure Test Certificate (1.5 times MWP for 10 minutes)	-P
Calibration Certificate (0, 25, 50, 75, 100, 75, 50, 25, 0)	-C
Dual Seal Order on High Side (s)	-1
Dual Seal Order on Low Side (s)	-2

- a. ASME Process Sizes (selections 1, H, 2, 3, 4) available with ASME Flange Ratings (selections A, B, C, D, E, F) and ASME Sealing Faces (selections A, B, C, D).
- b. Process Size 2" (selection 2) not available with Flange Rating CL2500 (selection F).
- c. Process Size 3" (selection 3) not available with Flange Rating CL1500, CL2500 (selections E, F).
- d. Process Size 4" (selection 4) not available with Flange Rating CL900, CL1500, CL2500 (selections D, E, F).
- e. EN 1092 Process Sizes (selections A, B, C, D, E) available with EN 1092 Flange Ratings (selections G, H, J, K, L, M) and EN 1092 Sealing Faces (selections F, G).
- f. JIS Process Sizes (selections F, G, J, K, L) available with JIS Flange Ratings (selections N, P, Q) and JIS Sealing Faces (selections H, J).
- g. Sealing Face Flat Face, Flat Face Smooth (selections C, D) Flange Material must match Sealing Face Material.
- h. Flange Materials Nickel Alloy C-276, Monel, Titanium, Duplex, Super Duplex (selections E, K, X, Q, R) must match Sealing Face Nickel Alloy C-276, Monel, Titanium, Duplex, Super Duplex (selections E, K, L, Q, R).
- i. Sealing Face Material, Diaphragm Material, and Lower Part Material must have the same material type selections, except for Tantalum; see note (m).
- j. Diaphragm Materials Titanium and Tantalum (selections L, P) not available with Wetted Parts Coating PFA (selection B).
- k. Maximum temperature limit is 149°C (300°F) when Sealing Face is 316 SS and Diaphragm Material is Titanium or Zirconium (selection L or M).
- l. Diaphragm Materials Titanium, Zirconium (selections L, M) not available with Option NACE (selection N).
- m. Diaphragm Material Tantalum (selection P) available only with Lower Part Material 316L SS and Nickel Alloy C-276 (selections A, E).
- n. Sealing Screw on Flushing Connection None (selection Z) can be selected with any Flushing Connection selection (Z, 2, 5, 3, 6).
- o. Flushing Connection: None (selection Z) must be selected with Sealing Screw on Flushing Connection None (selection Z) and Lower Part Material None (selection 4).
- p. Single Flushing Connections (selections 2, 3) must have 1 Sealing Screw on Flushing Connection (selection 1).
- q. Dual Flushing Connections (selections 5, 6) must have 2 Sealing Screws on Flushing Connection (selection 2).
- r. Flushing Screw Material is the same as Lower Housing Material.
- s. Optional selections -1 and -2 are for buyautomation.com and internal use only.

Table 5. Diaphragm Diameters and Process Sizes for DS-F

Diaphragm Diameter	Process Size
1.3 inches	1 inch; DN25
1.9 inches	1.5 inches; DN40
2.4 inches	2 inches; DN50
3.5 inches	3 inches; DN80
3.5 inches	4 inches; DN100

MODEL CODE – DS-G DIAPHRAGM SEALS

Description	Model
Flanged Flush Diaphragm Seal (Multi Piece Construction)	DS-G
<b>Process Size (see Table 6)</b>	
1 inch (ASME) (a)	1
1.5 inch (ASME) (a)	H
2 inch (ASME) (a)	2
3 inch (ASME) (a)	3
4 inch (ASME) (a)	4
EN DN25 (EN 1092) (b)	A
EN DN40 (EN 1092) (b)	B
EN DN50 (EN 1092) (b)	C
EN DN80 (EN 1092) (b)	D
EN DN100 (EN 1092) (b)	E
JIS DN25 (JIS) (c)	F
JIS DN40 (JIS) (c)	G
JIS DN50 (JIS) (c)	J
JIS DN80 (JIS) (c)	K
JIS DN100 (JIS) (c)	L
<b>Flange Rating (see Table 6)</b>	
ASME Class 150 (ASME)	A
ASME Class 300 (ASME)	B
ASME Class 600 (ASME)	C
ASME Class 900 (ASME)	D
ASME Class 1500 (ASME)	E
ASME Class 2500 (ASME)	F
EN PN10 (EN 1092)	G
EN PN16 (EN 1092)	H
EN PN25 (EN 1092)	J
EN PN40 (EN 1092)	K
EN PN63 (EN 1092)	L
EN PN100 (EN 1092)	M
10K (JIS)	N
16K (JIS)	P
20K (JIS)	Q
<b>Diaphragm Diameter (see Table 6)</b>	
1.3 inches	1
1.9 inches	2
2.4 inches	3
2.9 inches	5
3.5 inches	7
<b>Sealing Face</b>	
RF (Raised Face) 125...250 AA (ASME)	A
RFSF (Raised Face Smooth Finish) (ASME)	B
RTJ (Ring-Type Joint) (ASME) (d)	Z
Form B1 (EN 1092)	F
Form B2 (EN 1092)	G
RF (Raised Face) 125...250 AA (JIS)	H
RFSF (Raised Face Smooth Finish) (JIS)	J
<b>Flange Material</b>	
Stainless Steel (316L) UNS S31603	A
Nickel-Plated Carbon Steel (A350 FL2)	B
Nickel-Plated Carbon Steel (1018) UNS G10180	1
Nickel Alloy C-276 UNS N10276	E
Monel 400 UNS N04400	K
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R

MODEL CODE – DS-G DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Face Plate Material (e) (f)</b>	
Stainless Steel (316L) UNS S31603 (g)	A
Carpenter 20 UNS N08020	D
Nickel Alloy C-276 UNS N10276 (g)	E
Nickel Alloy B-3 UNS N10675	F
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Monel 400 UNS N04400	K
Titanium Grade 2 UNS R50400	X
Titanium Grade 4 UNS R50700	L
Zirconium 702 UNS R60702	M
Nickel UNS N02200	N
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Incoloy 825 UNS N08825	U
<b>Diaphragm Material (f)</b>	
Stainless Steel (316L) UNS S31603	A
Carpenter 20 UNS N08020	D
Nickel Alloy C-276 UNS N10276	E
Nickel Alloy B-3 UNS N10675	F
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Monel 400 UNS N04400	K
Titanium Grade 4 UNS R50700	L
Zirconium 702 UNS R60702	M
Nickel UNS N02200	N
Tantalum UNS R05200 (d) (g) (h)	P
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Incoloy 825 UNS N08825	U
<b>Flushing Connection</b>	
None (i)	Z
1 x 1/4 NPT Female	2
2 x 1/4 NPT Female	5
1 x 1/2 NPT Female	3
2 x 1/2 NPT Female	6
<b>Sealing Screw on Flushing Connection</b>	
None (i)	Z
1 Sealing Screw	1
2 Sealing Screws	2
<b>Flushing Ring Material (f)</b>	
None (i)	4
Stainless Steel (316L) UNS S31603 (h)	A
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy C-276 UNS N10276 (h)	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 2 UNS R50400	X
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702	M

MODEL CODE – DS-G DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Wetted Parts Coating</b>	
No Coating	Z
Gold Plated (50 μinch) (j)	6
Double Gold Plated (100 μinch) (j)	7
PFA Coating 0.15 mm (Antistatic) (j)	B
<b>Optional Selections</b>	
NACE MR0103/MR0175 (k)	-N
Material Certification per EN 10204 3.1	-M
Pressure Test Certificate (1.5 times MWP for 10 minutes)	-P
Calibration Certificate (0, 25, 50,75, 100, 75, 50, 25, 0)	-C
Dual Seal Order on High Side (I)	-1
Dual Seal Order on Low Side (I)	-2

- a. ASME Process Sizes (selections 1, H, 2, 3, 4) available with ASME Flange Ratings (selections A, B, C, D, E, F) and ASME Sealing Faces (selections A, B, C, D, Z).
- b. EN 1092 Process Sizes (selections A, B, C, D, E) available with EN 1092 Flange Ratings (selections G, H, J, K, L, M) and EN 1092 Sealing Faces (selections F, G).
- c. JIS Process Sizes (selections F, G, J, K, L) available with JIS Flange Ratings (selections N, P, Q) and JIS Sealing Faces (selections H, J).
- d. Diaphragm Material Tantalum (selection P) not available with Sealing Face RTJ (selection Z).
- e. Face Plate Material Stainless Steel (selections A, V) can have any Diaphragm Material; all other Face Plate Materials must have the same material as the Diaphragm Material.
- f. Face Plate Material, Diaphragm Material, and Flushing Ring Material must have the same material type selections, except for Tantalum; see note (g).
- g. Face Plate Materials 316L SS and Nickel Alloy C-276 (selections A, E) available with Diaphragm Material Tantalum (selection P).
- h. Diaphragm Material Tantalum (selection P) available only with Flushing Ring Materials 316L SS and Nickel Alloy C-276 (selections A, E).
- i. Flushing Connection None (selection Z) must be selected with Sealing Screw None (selection Z), Flushing Ring Material None (selection 4), and Flushing Screw Material None (selection 4).
- j. Wetted Parts Coatings Gold and PFA (selections 6, 7, B) not available with Diaphragm Materials Titanium, Zirconium, or Tantalum (selections L, M, P).
- k. Diaphragm Materials Titanium and Zirconium (selections L, M) not available with NACE (option -N).
- l. Optional selections -1 and -2 are for buyautomation.com and internal use only.

Table 6. Diaphragm Diameters, Process Sizes, and Pressure Ratings for DS-G

Flange Rating	Process Size				
	1", DN25	1.5", DN40	2", DN50	3", DN80	4", DN100
1.3 Diaphragm Diameter					
150 to 2500; PN10 to PN100	Yes	-	-	-	-
2500 RTJ	-	-	-	-	-
1.9" Diaphragm Diameter					
150 to 2500; PN10 to PN100	-	Yes	-	-	-
2500 RTJ	Yes	-	-	-	-
2.4" Diaphragm Diameter					
150 to 2500; PN10 to PN100	-	-	Yes	-	-
900 RTJ; 1500 RTJ	-	-	-	-	-
2500 RTJ	-	Yes	-	-	-
2.9" Diaphragm Diameter					
150 to 1500	-	-	-	-	-
900 RTJ; 1500 RTJ	-	-	Yes	-	-
2500; 2500 RTJ	-	-	-	-	-
3.5" Diaphragm Diameter					
150 to 2500; PN10 to PN100	-	-	-	Yes	Yes
2500 RTJ	-	-	Yes	Yes	Yes

MODEL CODE – DS-H DIAPHRAGM SEALS

Description	Model
Flanged Extended Diaphragm Seal	DS-H
<b>Process Size (see Table 7)</b>	
1 inch (ASME) (a)	1
1.5 inch (ASME) (a)	H
2 inch (ASME) (a)	2
3 inch (ASME) (a)	3
4 inch (ASME) (a)	4
EN DN25 (EN 1092) (b)	A
EN DN40 (EN 1092) (b)	B
EN DN50 (EN 1092) (b)	C
EN DN80 (EN 1092) (b)	D
EN DN100 (EN 1092) (b)	E
JIS DN25 (JIS) (c)	F
JIS DN40 (JIS) (c)	G
JIS DN50 (JIS) (c)	J
JIS DN80 (JIS) (c)	K
JIS DN100 (JIS) (c)	L
<b>Flange Rating</b>	
ASME Class 150 (ASME)	A
ASME Class 300 (ASME)	B
ASME Class 600 (ASME)	C
ASME Class 900 (ASME)	D
ASME Class 1500 (ASME)	E
ASME Class 2500 (ASME)	F
EN PN10 (EN 1092)	G
EN PN16 (EN 1092)	H
EN PN25 (EN 1092)	J
EN PN40 (EN 1092)	K
EN PN63 (EN 1092)	L
EN PN100 (EN 1092)	M
10K (JIS)	N
16K (JIS)	P
20K (JIS)	Q
<b>Diaphragm Diameter (see Table 7)</b>	
1.0 inches	9
1.5 inches	A
1.9 inches	2
2.4 inches	3
2.8 inches	4
3.5 inches	7
<b>Sealing Face</b>	
RF (Raised Face) 125...250 AA (ASME)	A
RF SF (Raised Face Smooth Finish) (ASME)	B
Flat Face 125...250 AA (ASME)	C
Flat Face Smooth Finish (ASME)	D
RTJ (Ring-Type Joint) (ASME)	Z
Form B1 (EN 1092)	F
Form B2 (EN 1092)	G
RF (Raised Face) 125...250 AA (JIS)	H
RF SF (Raised Face Smooth Finish) (JIS)	J

MODEL CODE – DS-H DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Flange Material</b>	
Carpenter 20 UNS N08020	D
Stainless Steel (316L) UNS S31603	A
Nickel-Plated Carbon Steel (1018) UNS G10180	1
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-276 UNS N10276	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Monel 400 UNS N04400	K
Titanium Grade 2 UNS R50400	X
<b>Sealing Face Material (d)</b>	
Carpenter 20 UNS N08020	D
Stainless Steel (316L) UNS S31603 (e)	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-276 UNS N10276 (f)	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Titanium Grade 2 UNS R50400	X
Tantalum UNS R05200	P
Nickel UNS N02200	N
<b>Extension Material (d)</b>	
Carpenter 20 UNS N08020	D
Stainless Steel (316L) UNS S31603 (e)	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-276 UNS N10276 (f)	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Tantalum UNS R05200	P
Titanium Grade 2 UNS R50400	X
Zirconium 702 UNS R60702	M
<b>Diaphragm Material (d)</b>	
Carpenter 20 UNS N08020	D
Stainless Steel (316L) UNS S31603	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-276 UNS N10276 (e)	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 4 UNS R50700 (g) (h)	L
Tantalum UNS R05200 (f) (g)	P
Zirconium 702 UNS R60702 (g) (h)	M

MODEL CODE – DS-H DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Wetted Parts Coating</b>	
No Coating	Z
Gold Plated (50 μinch) (g)	6
Double Gold Plated (100 μinch) (g)	7
PFA Coating 0.15 mm (Antistatic) (g)	B
<b>Extension Length</b>	
2 inches	A
3 inches	B
4 inches	C
5 inches	D
6 inches	E
7 inches	F
8 inches	G
9 inches	H
10 inches	J
<b>Extension Diameter (see Table 7)</b>	
1.0 inch	A
1.5 inches	B
1.9 inches	C
2.4 inches	D
2.5 inches	E
2.8 inches	F
3.5 inches	G
<b>Optional Selections</b>	
NACE MR0103/MR0175 (h)	-N
Material Certification per EN 10204 3.1	-M
Pressure Test Certificate (1.5 times MWP for 10 minutes)	-P
Calibration Certificate (0, 25, 50,75, 100, 75, 50, 25, 0)	-C
Dual Seal Order on High Side (i)	-1
Dual Seal Order on Low Side (i)	-2

- a. ASME Process Sizes (selections 1, H, 2, 3, 4) available with ASME Flange Ratings (selections A, B, C, D, E, F) and ASME Sealing Faces (selections A, B, C, D, Z).
- b. EN 1092 Process Sizes (selections A, B, C, D, E) available with EN 1092 Flange Ratings (selections G, H, J, K, L, M) and EN 1092 Sealing Faces (selections F, G).
- c. JIS Process Sizes (selections F, G, J, K, L) available with JIS Flange Ratings (selections N, P, Q) and JIS Sealing Faces (selections H, J).
- d. Sealing Face Material, Diaphragm Material, and Extension Material must have the same material type selections, except see notes (e), (f).
- e. Sealing Face Material 316L (selection A) and Extension Material 316L (selection A) can have Diaphragm Material Nickel Alloy C-276 (selection E).
- f. Sealing Face Material Nickel Alloy C-276 (selection E) and Extension Material Nickel Alloy C-276 (selection E) can have Diaphragm Material Tantalum (selection P).
- g. Wetted Parts Coatings Gold, PFA (selections 6, 7, B) not available with Diaphragm Materials Titanium, Tantalum, and Zirconium (selections L, P, M).
- h. Diaphragm Materials Titanium, Zirconium (selections L, M) not available with Option NACE (selection N).
- i. Optional selections -1 and -2 are for buyautomation.com and internal use only.



Table 7. Diaphragm Diameters, Process Sizes, and Extension Diameters for DS-H

Extension Diameter	Process Size				
	1", DN25	1.5", DN40	2", DN50	3", DN80	4", DN100
1.0" Diaphragm Diameter					
1 inch	Yes	-	-	-	-
1.5 to 3.7 inch	-	-	-	-	-
1.5" Diaphragm Diameter					
1 inch	-	-	-	-	-
1.5 inch	-	Yes	Yes	-	-
1.9 to 3.7 inch	-	-	-	-	-
1.9" Diaphragm Diameter					
1 to 1.5 inch	-	-	-	-	-
1.9 inch	-	-	Yes	-	-
2.4 to 3.7 inch	-	-	-	-	-
2.4" Diaphragm Diameter					
1 to 1.9 inch	-	-	-	-	-
2.4 to 2.5 inch	-	-	-	Yes	-
2.8 to 3.7 inch	-	-	-	-	-
2.8" Diaphragm Diameter					
1 to 2.5 inch	-	-	-	-	-
2.8 inch	-	-	-	Yes	Yes
3.7 inch	-	-	-	-	-
3.5" Diaphragm Diameter					
1 to 2.8 inch	-	-	-	-	-
3.7 inch	-	-	-	-	Yes

MODEL CODE – DS-J DIAPHRAGM SEALS

Description	Model
Pancake Diaphragm Seal	DS-J
<b>Process Size (see Table 8)</b>	
1 inch (ASME) (a)	1
1.5 inch (ASME) (a)	H
2 inch (ASME) (a)	2
3 inch (ASME) (a)	3
4 inch (ASME) (a)	4
EN DN25 (EN 1092) (b)	A
EN DN40 (EN 1092) (b)	B
EN DN50 (EN 1092) (b)	C
EN DN80 (EN 1092) (b)	D
EN DN100 (EN 1092) (b)	E
JIS DN25 (JIS) (c)	F
JIS DN40 (JIS) (c)	G
JIS DN50 (JIS) (c)	J
JIS DN80 (JIS) (c)	K
JIS DN100 (JIS) (c)	L
<b>Flange</b>	
Yes	1
No	0
<b>Flange Rating (see Table 8)</b>	
None	0
ASME Class 150 (ASME)	A
ASME Class 300 (ASME)	B
ASME Class 600 (ASME)	C
ASME Class 900 (ASME)	D
ASME Class 1500 (ASME)	E
ASME Class 2500 (ASME)	F
EN PN10 (EN 1092)	G
EN PN16 (EN 1092)	H
EN PN25 (EN 1092)	J
EN PN40 (EN 1092)	K
EN PN63 (EN 1092)	L
EN PN100 (EN 1092)	M
10K (JIS)	N
16K (JIS)	P
20K (JIS)	Q
<b>Diaphragm Diameter (see Table 8)</b>	
1.3 inches	1
1.9 inches	2
2.4 inches	3
2.9 inches	5
3.5 inches	7

MODEL CODE – DS-J DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Sealing Face</b>	
RF (Raised Face) 125...250 AA (ASME)	A
RFSF (Raised Face Smooth Finish) (ASME)	B
Flat Face 125...250 AA (ASME)	C
RTJ (Ring-Type Joint) (ASME) (d)	Z
Flat Face Smooth Finish (ASME)	D
Large Tongue (ASME)	E
Small Tongue (ASME)	1
Large Male Face (ASME)	K
Small Male Face (ASME)	L
Large Groove (ASME)	M
Small Groove (ASME)	N
Large Female Face (ASME)	P
Small Female Face (ASME)	Q
Form B1 (EN 1092)	F
Form B2 (EN 1092)	G
RF (Raised Face) 125...250 AA (JIS)	H
RFSF (Raised Face Smooth Finish) (JIS)	J
Form C Tongue (EN 1092)	R
Form D Groove (EN 1092)	S
Form E Male-Faced with B1 Surface (EN 1092)	T
Form E Male-Faced with B2 Surface (EN 1092)	U
Form F Female-Faced with B1 Surface (EN 1092)	V
Form F Female-Faced with B2 Surface (EN 1092)	W
Form G O-Ring Male-Faced (EN 1092)	X
Form H O-Ring Groove (EN 1092)	Y
<b>Flange Material</b>	
None	0
Stainless Steel (316L) UNS S31603	A
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-276 UNS N10276	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 2 UNS R50400	X
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702	M
<b>Face Plate Material (e)</b>	
Stainless Steel (316L) UNS S31603 (f)	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-276 UNS N10276 (g)	E
Nickel Alloy B-3 UNS N06895	F
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 2 UNS R50400	X
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702	M
Titanium Grade 7 UNS R52400	2

MODEL CODE – DS-J DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Diaphragm Material (h)</b>	
Stainless Steel (316L) UNS S31603	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy C-276 UNS N10276 (g)	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 2 UNS R50400	X
Tantalum UNS R05200 (g) (i)	P
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702	M
Titanium Grade 7 UNS R52400	2
<b>Flushing Connection</b>	
None (j)	Z
1 x 1/4 NPT Female	2
2 x 1/4 NPT Female	5
1 x 1/2 NPT Female	3
2 x 1/2 NPT Female	6
Welded Hand Valve (Single)	7
Welded Hand Valve (Dual)	8
<b>Sealing Screw on Flushing Connection</b>	
None (j)	Z
1 Sealing Screw	1
2 Sealing Screws	2
<b>Flushing Ring Material (h)</b>	
None (j)	4
Stainless Steel (316L) UNS S31603	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy C-276 UNS N10276	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 2 UNS R50400	X
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702	M
<b>Wetted Parts Coating</b>	
No Coating	Z
Gold Plated (50 μinch) (k)	6
Double Gold Plated (100 μinch) (k)	7
PFA Coating 0.15 mm (Antistatic) (k)	B

MODEL CODE – DS-J DIAPHRAGM SEALS (CONTINUED)

Description	Model
<p><b>Optional Selections</b>                      NACE (I)                      Material Certification per EN 10204 3.1                      Pressure Test Certificate (1.5 times MWP for 10 minutes)                      Calibration Certificate (0, 25, 50,75, 100, 75, 50, 25, 0)                      Dual Seal Order on High Side (m)                      Dual Seal Order on Low Side (m)</p>	<p>-N                      -M                      -P                      -C                      -1                      -2</p>

- a. ASME Process Sizes (selections 1, H, 2, 3, 4) available with ASME Flange Ratings (selections A, B, C, D, E, F) and ASME Sealing Faces (selections A, B, C, D, Z, 1, K, L, M, N, P, Q).
- b. EN 1092 Process Sizes (selections A, B, C, D, E) available with EN 1092 Flange Ratings (selections G, H, J, K, L, M) and EN 1092 Sealing Faces (selections F, G, R, S, T, U, V, W, X, Y).
- c. JIS Process Sizes (selections F, G, J, K, L) available with JIS Flange Ratings (selections N, P, Q) and JIS Sealing Faces (selections H, J).
- d. Diaphragm Material Tantalum (selection P) not available with Sealing Face RTJ (selection Z).
- e. Flange Yes (selection 1) not available with Flange Rating None (selection 0).
- f. Face Plate Material 316 SS (selection A) can have any Diaphragm Material; all other Face Plate Materials must have the same selection as the Diaphragm Material.
- g. Face Plate Material Nickel Alloy C-276 (selection E) can have Diaphragm Material Nickel Alloy C-276 or Tantalum (selections E, P).
- h. Diaphragm Material and Flushing Ring Material must have the same material type selections, except for Diaphragm Material Tantalum; see note (i).
- i. Diaphragm Material Tantalum (selection P) must have Flushing Ring Material 316L SS or Nickel Alloy C-276 (selections A, E).
- j. Flushing Connection None (selection Z) must be selected with Sealing Screw None (selection Z), Flushing Ring Material None (selection 4), and Flushing Screw Material None (selection 4).
- k. Wetted Parts Coatings Gold and PFA (selections 6, 7, B) not available with Diaphragm Materials Titanium, Tantalum, Zirconium (selections X, P, M, 2).
- l. Diaphragm Materials Titanium, Zirconium (selections X, 2, M) not available with option NACE (selection N).
- m. Optional selections -1 and -2 are for buyautomation.com and internal use only.

Table 8. Diaphragm Diameters, Process Sizes, and Pressure Ratings for DS-J

Flange Rating	Process Size				
	1", DN25	1.5", DN40	2", DN50	3", DN80	4", DN100
1.3" Diaphragm Diameter					
150 to 2500; PN10 to PN100	Yes	-	-	-	-
2500 RTJ	-	-	-	-	-
1.9" Diaphragm Diameter					
150 to 2500; PN10 to PN100	-	Yes	-	-	-
2500 RTJ	Yes	-	-	-	-
2.4" Diaphragm Diameter					
150 to 2500; PN10 to PN100	-	-	Yes	-	-
900 RTJ; 1500 RTJ	-	-	-	-	-
2500 RTJ	-	Yes	-	-	-
2.9" Diaphragm Diameter					
150 to 1500	-	-	-	-	-
900 RTJ; 1500 RTJ	-	-	Yes	-	-
2500; 2500 RTJ	-	-	-	-	-
3.5" Diaphragm Diameter					
150 to 2500; PN10 to PN100	-	-	-	Yes	Yes
2500 RTJ	-	-	Yes	Yes	Yes

MODEL CODE – DS-M DIAPHRAGM SEALS

Description	Model
Flanged Diaphragm Seal (Stud Bolt)	DS-M
<b>Process Size (see Table 9)</b>	
0.5 inch (ASME) (a)	M
0.75 inch (ASME) (a)	N
1 inch (ASME) (a)	1
1.5 inch (ASME) (a)	H
2 inch (ASME) (a)	2
EN DN25 (EN 1092) (b)	A
EN DN40 (EN 1092) (b)	B
EN DN50 (EN 1092) (b)	C
JIS DN25 (JIS) (c)	F
JIS DN40 (JIS) (c)	G
JIS DN50 (JIS) (c)	J
<b>Flange Rating (see Table 9)</b>	
ASME Class 150 (ASME)	A
ASME Class 300 (ASME)	B
ASME Class 600 (ASME)	C
ASME Class 900 (ASME) (d) (e)	D
ASME Class 1500 (ASME) (d) (e)	E
EN PN10 (EN 1092)	G
EN PN16 (EN 1092)	H
EN PN25 (EN 1092)	J
EN PN40 (EN 1092)	K
10K (JIS)	N
16K (JIS)	P
20K (JIS)	Q
<b>Diaphragm Diameter (see Table 9)</b>	
2.4 inches	3
2.9 inches (d)	5
4.1 inches (e)	8
<b>Sealing Face</b>	
RF (Raised Face) 125...250 AA (ASME)	A
RFSF (Raised Face Smooth Finish) (ASME)	B
Flat Face 125...250 AA (ASME)	C
Flat Face Smooth Finish (ASME)	D
Large Tongue (ASME)	E
Small Tongue (ASME)	2
Large Male Face (ASME)	K
Small Male Face (ASME)	L
Large Groove (ASME)	M
Small Groove (ASME)	N
Large Female Face (ASME)	P
Small Female Face (ASME)	Q

MODEL CODE – DS-M DIAPHRAGM SEALS (CONTINUED)

Description	Model
Form B1 (EN 1092)	F
Form B2 (EN 1092)	G
RF (Raised Face) 125...250 AA (JIS)	H
RFSF (Raised Face Smooth Finish) (JIS)	J
Form C Tongue (EN 1092)	R
Form D Groove (EN 1092)	S
Form E Male-Faced with B1 Surface (EN 1092)	T
Form E Male-Faced with B2 Surface (EN 1092)	U
Form F Female-Faced with B1 Surface (EN 1092)	V
Form F Female-Faced with B2 Surface (EN 1092)	W
Form G O-Ring Male-Faced (EN 1092)	X
Form H O-Ring Groove (EN 1092)	Y
RJF (Ring Joint Facing) Groove (ASME)	Z
<b>Upper Body Material</b>	
Carpenter 20 2.4660 UNS N08020	D
Carbon Steel 1.0453 (1018) UNS G10180 (f)	1
Stainless Steel 1.4404 (316L) UNS S31603 (f) (g)	A
Stainless Steel 1.4541 (321) UNS S32100	V
Duplex 2205 1.4462 UNS S31803	Q
Super Duplex 2507 1.4410 UNS S32750	R
Nickel Alloy C-276 2.4819 UNS N10276 (g)	E
Inconel 625 2.4856 UNS N06625	J
Incoloy 825 2.4858 UNS N08825	U
Monel 400 2.4360 UNS N04400	K
Titanium 3.7035 Grade 2 UNS R50400 (h)	X
Zirconium 702 UNS R60702 (i)	M
<b>Diaphragm Material (j)</b>	
Stainless Steel (316L) UNS S31603	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy C-22 UNS N06022	T
Nickel Alloy C-276 UNS N10276	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 4 UNS R50700 (h) (k) (l)	L
Tantalum UNS R05200 (g) (k) (m)	P
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702 (i) (k) (l)	M



MODEL CODE – DS-M DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Lower Part Material (j)</b>	
Stainless Steel (316L) UNS S31603	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy C-22 UNS N06022	T
Nickel Alloy C-276 UNS N10276	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 2 UNS R50400 (h)	X
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702 (i)	M
<b>Gasket</b>	
None	Z
PTFE max. 260°C (500°F)	P
Statotherm (Graphit) max. 400°C (752°F)	S
Klinger C-4401 max. 232°C (450°F)	K
Gylon 3510 max. 260°C (500°F)	O
Buna-N max. 121°C (250°F)	Q
Kalrez max. 316°C (601°F)	R
EPDM max. 149°C (300°F)	E
Top Chem 2000 max. 249°C (480°F)	T
PTFE Encap Viton max. 149°C (300°F)	U
FPM max. 200°C (392°F)	V
<b>Fastening Parts</b>	
Bolts in Steel (Grade 8 Zinc) (d) (e)	H
Bolts in 304L Stainless Steel	I
A193 B7M NACE Fasteners (d)	J
<b>Flushing Connection</b>	
None	Z
1 x 1/4 NPT Female	2
2 x 1/4 NPT Female	5
1 x 1/2 NPT Female	3
2 x 1/2 NPT Female	6
<b>Sealing Screw on Flushing Connection</b>	
None	Z
1 Sealing Screw	1
2 Sealing Screws	2
<b>Wetted Parts Coating</b>	
No Coating	Z
Gold Plated (50 µinch) (k)	6
Double Gold Plated (100 µinch) (k)	7
PFA Coating 0.15 mm (Antistatic) (k)	B
<b>Optional Selections</b>	
NACE MR0103/MR0175 (l)	-N
Material Certification per EN 10204 3.1	-M
Pressure Test Certificate (1.5 times MWP for 10 minutes)	-P
Calibration Certificate (0, 25, 50,75, 100, 75, 50, 25, 0)	-C
Dual Seal Order on High Side (n)	-1
Dual Seal Order on Low Side (n)	-2

- a. ASME Process Sizes (selections M, N, 1, H, 2) available with ASME Flange Ratings (selections A, B, C, D, E, F) and ASME Sealing Faces (selections A, B, C, D, E, 2, K, L, M, N, P, Q, Z).
- b. EN 1092 Process Sizes (selections A,B,C,D,E) available with EN 1092 Flange Ratings (selections G, H, J, K, L, M) and EN 1092 Sealing Faces (selections F, G, R, S, T, U, V, W, X, Y).
- c. JIS Process Sizes (selections F, G, J, K, L) available with JIS Flange Ratings (selections N, P, Q) and JIS Sealing Faces (selections H, J).
- d. Diaphragm Diameter 2.9 (selection 5) only available with Flange Ratings 900 and 1500 (selections D, E) and Fastening Parts Carbon Steel Grade 8 and NACE A193 (selections H, J).
- e. Diaphragm Diameter 4.1 (selection 8) only available with Flange Ratings 900 and 1500 (selections D, E) and Fastening Parts Carbon Steel Grade 8 (selection H).
- f. Upper Body Material 316L SS or Carbon Steel (selections A, 1) available with any Diaphragm Material. All other Upper Body Materials must match the Diaphragm Material, except see notes (g), (m).
- g. Upper Body Material 316L SS or Nickel Alloy C-276 (selections A, E) available with Diaphragm Material Tantalum (selection P).
- h. Upper Body Material Titanium (selection L), Diaphragm Material Titanium (selection L), and Lower Part Material Titanium (selections X, W) must have the same material type selections.
- i. Upper Body Material Zirconium (selection M), Diaphragm Material Zirconium (selection M), and Lower Part Material Zirconium (selection M) must have the same material type selections.
- j. Diaphragm Material and Lower Part Material must have the same material type selections, except for Diaphragm Material Tantalum (selection P); see note (m).
- k. Wetted Parts Coatings Gold, PFA (selections 6, 7, B) not available with Diaphragm Materials Titanium, Tantalum, and Zirconium (selections L, P, M).
- l. Diaphragm Materials Titanium, Zirconium (selections L, M) not available with Option NACE (selection N).
- m. Diaphragm Material Tantalum (selection P) must have Lower Part Material 316L SS or Nickel Alloy C-276 (selections A, E).
- n. Optional selections -1 and -2 are for buyautomation.com and internal use only.

**Table 9. Diaphragm Diameters, Process Sizes, and Pressure Ratings for DS-M**

Flange Rating	Process Size						
	1/2"	3/4"	1", DN25	1.5", DN40	2", DN50	3", DN80	4", DN100
<b>2.4" Diaphragm Diameter</b>							
150, PN10, PN16	Yes	Yes	-	-	-	-	-
300 to 1500; PN25 to PN40	Yes	-	-	-	-	-	-
<b>2.9" Diaphragm Diameter</b>							
150 to 600; PN10 to PN40	Yes	Yes	Yes	-	-	-	-
900, 1500	Yes	Yes	-	-	-	-	-
<b>4.1" Diaphragm Diameter</b>							
150, PN10, PN16	Yes	Yes	Yes	Yes	Yes	-	-
300 to 1500; PN25 to PN40	Yes	Yes	Yes	Yes	-	-	-

MODEL CODE – DS-N DIAPHRAGM SEALS

Description	Model
Flanged Diaphragm Seal (Through Bolt)	DS-N
<b>Process Size (see Table 10)</b>	
0.5 inch (ASME) (a)	M
0.75 inch (ASME) (a)	N
1 inch (ASME) (a)	1
1.5 inch (ASME) (a)	H
2 inch (ASME) (a)	2
3 inch (ASME) (a)	3
4 inch (ASME) (a)	4
EN DN25 (EN 1092) (b)	A
EN DN40 (EN 1092) (b)	B
EN DN50 (EN 1092) (b)	C
EN DN80 (EN 1092) (b)	D
EN DN100 (EN 1092) (b)	E
JIS DN25 (JIS) (c)	F
JIS DN40 (JIS) (c)	G
JIS DN50 (JIS) (c)	J
JIS DN80 (JIS) (c)	K
JIS DN100 (JIS) (c)	L
<b>Flange Rating (see Table 10)</b>	
ASME Class 150 (ASME)	A
ASME Class 300 (ASME)	B
ASME Class 600 (ASME)	C
ASME Class 900 (ASME)	D
ASME Class 1500 (ASME)	E
ASME Class 2500 (ASME)	F
EN PN10 (EN 1092)	G
EN PN16 (EN 1092)	H
EN PN25 (EN 1092)	J
EN PN40 (EN 1092)	K
EN PN63 (EN 1092)	L
EN PN100 (EN 1092)	M
10K (JIS)	N
16K (JIS)	P
20K (JIS)	Q
<b>Diaphragm Diameter (see Table 10)</b>	
2.4 inches	3
2.9 inches	5
4.1 inches	8

MODEL CODE – DS-N DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Sealing Face</b>	
RF (Raised Face) 125...250 AA (ASME)	A
RF SF (Raised Face Smooth Finish) (ASME)	B
Flat Face 125...250 AA (ASME)	C
Flat Face Smooth Finish (ASME)	D
Large Tongue (ASME)	E
Small Tongue (ASME)	1
Large Male Face (ASME)	K
Small Male Face (ASME)	L
Large Groove (ASME)	M
Small Groove (ASME)	N
Large Female Face (ASME)	P
Small Female Face (ASME)	Q
Form B1 (EN 1092)	F
Form B2 (EN 1092)	G
RF (Raised Face) 125...250 AA (JIS)	H
RF SF (Raised Face Smooth Finish) (JIS)	J
Form C Tongue (EN 1092)	R
Form D Groove (EN 1092)	S
Form E Male-Faced with B1 Surface (EN 1092)	T
Form E Male-Faced with B2 Surface (EN 1092)	U
Form F Female-Faced with B1 Surface (EN 1092)	V
Form F Female-Faced with B2 Surface (EN 1092)	W
Form G O-Ring Male-Faced (EN 1092)	X
Form H O-Ring Groove (EN 1092)	Y
RTJ (Ring-Type Joint) Groove (ASME)	Z
<b>Flange Material</b>	
Carpenter 20 2.4660 UNS N08020	D
Nickel-Plated Carbon Steel 1.0356 (A350 LF2)	B
Nickel-Plated Carbon Steel 1.0453 (1018) UNS G10180	1
Stainless Steel 1.4404 (316L) UNS S31603	A
Nickel Alloy C-276 2.4819 UNS N10276	E
Titanium 3.7-35 Grade 2 UNS R50400	X
Zirconium 702 UNS R60702	M
<b>Upper Insert Material (d)</b>	
Stainless Steel 1.4404 (316L) UNS S31603	A
Titanium 3.7035 Grade 2 UNS R50400 (e)	X
Zirconium 702 UNS R60702 (e)	M
<b>Face Plate Material (d)</b>	
Stainless Steel 1.4404 (316L) UNS S31603	A
Titanium 3.7035 Grade 2 UNS R50400 (f)	X
Zirconium 702 UNS R60702 (f)	M

MODEL CODE – DS-N DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Diaphragm Material (g)</b>	
Stainless Steel (316L) UNS S31603	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy C-22 UNS N06022	T
Nickel Alloy C-276 UNS N10276	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 4 UNS R50700 (h)	L
Tantalum UNS R05200 (i)	P
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702 (h)	M
<b>Lower Part Material (g)</b>	
Carbon Steel (1018)	1
Stainless Steel (316L) UNS S31603	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy B-3 UNS N10675	F
Nickel Alloy C-22 UNS N06022	T
Nickel Alloy C-276 UNS N10276	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 2 UNS R50400	X
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702	M
<b>Gasket</b>	
None	Z
PTFE max. 260°C (500°F)	P
Statotherm (Graphit) max. 400°C (752°F)	S
Klinger C-4401 max. 232°C (450°F)	K
Gylon 3510 max. 260°C (500°F)	O
Buna-N max. 121°C (250°F)	Q
Kalrez max. 316°C (601°F)	R
EPDM max. 149°C (300°F)	E
Top Chem 2000 max. 249°C (480°F)	T
PTFE Encap Viton max. 149°C (300°F)	U
FPM max. 200°C (392°F)	V
<b>Flushing Connection</b>	
None	Z
1 x 1/4 NPT Female	2
2 x 1/4 NPT Female	5
1 x 1/2 NPT Female	3
2 x 1/2 NPT Female	6
Welded Hand Valve (Single)	7
Welded Hand Valve (Dual)	8

MODEL CODE – DS-N DIAPHRAGM SEALS (CONTINUED)

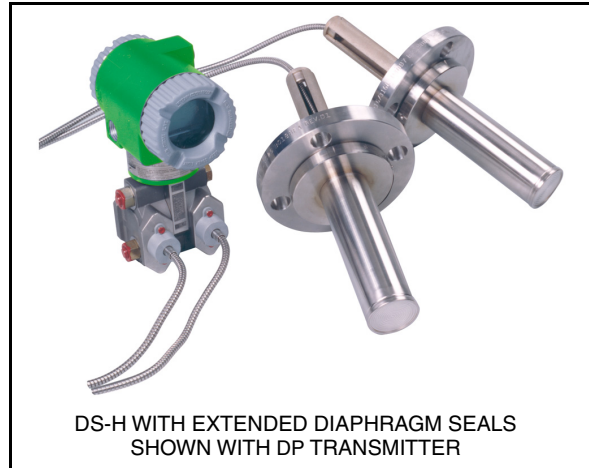
Description	Model
<b>Sealing Screw on Flushing Connection</b>	
None	Z
1 Sealing Screw	1
2 Sealing Screws	2
<b>Wetted Parts Coating</b>	
No Coating	Z
Gold Plated (50 µinch) (j)	6
Double Gold Plated (100 µinch) (j)	7
PFA Coating 0.15 mm (Antistatic) (j)	B
<b>Optional Selections</b>	
NACE MR0103/MR0175 (k)	-N
Material Certification per EN 10204 3.1	-M
Pressure Test Certificate (1.5 times MWP for 10 minutes)	-P
Calibration Certificate (0, 25, 50,75, 100, 75, 50, 25, 0)	-C
Dual Seal Order on High Side (l)	-1
Dual Seal Order on Low Side (l)	-2

- a. ASME Process Sizes (selections M, N, 1, H, 2, 3, 4) available with ASME Flange Ratings (selections A, B, C, D, E, F) and ASME Sealing Faces (selections A, B, C, D, E, 1, K, L, M, N, P, Q, Z).
- b. EN 1092 Process Sizes (selections A, B, C, D, E) available with EN 1092 Flange Ratings (selections G, H, J, K, L, M) and EN 1092 Sealing Faces (selections F, G, R, S, T, U, V, W, X, Y).
- c. JIS Process Sizes (selections F, G, J, K, L) available with JIS Flange Ratings (selections N, P, Q) and JIS Sealing Faces (selections H, J).
- d. Upper Insert Material and Face Plate Material must be the same.
- e. Upper Insert Materials Titanium, Zirconium (selections T, M), Face Plate Materials Titanium, Zirconium (selections T, M), and Diaphragm Materials Titanium, Zirconium (selections L, W, M) must have the same material type selections.
- f. Face Plate Materials Titanium, Zirconium (selections X, M) must have the same Diaphragm Materials Titanium, Zirconium (selections L, M).
- g. Diaphragm Material and Lower Part Material must have the same material type selections.
- h. Face Plate Material 316L SS (selection A) available with Diaphragm Materials Titanium, Zirconium (selections L, M).
- i. Diaphragm Material Tantalum (selection P) available with Lower Part Materials Nickel Alloy, Tantalum (selections E, F, P, T).
- j. Wetted Parts Coatings Gold, PFA (selections 6, 7, B) not available with Diaphragm Materials Titanium, Tantalum, and Zirconium (selections L, P, M).
- k. Diaphragm Materials Titanium, Zirconium (selections L, M) not available with Option NACE (selection N).
- l. Optional selections -1 and -2 are for buyautomation.com and internal use only.

Table 10. Diaphragm Diameters, Process Sizes, and Pressure Ratings for DS-N

Flange Rating	Process Size						
	1/2"	3/4"	1", DN25	1.5", DN40	2", DN50	3", DN80	4", DN100
2.4" Diaphragm Diameter							
150, PN10, PN16	-		Yes	Yes	Yes	-	-
300 to 1500; PN25 to PN100	-	Yes	Yes	Yes	Yes	-	-
2500	Yes	Yes	Yes	Yes	-	-	-
2.9" Diaphragm Diameter							
150 to 600; PN10 to PN100	-	-	-	Yes	Yes	-	-
900, 1500	-	-	Yes	Yes	Yes	-	-
2500	-	-	-	-	-	-	-
4.1" Diaphragm Diameter							
150, PN10, PN16	-	-	-	-	-	Yes	Yes
300 to 600; PN25 to PN100	-	-	-	-	Yes	Yes	Yes
900	-	-	-	-	Yes	Yes	-
500	-	-	-	-	Yes	-	-
2500	-	-	-	-	-	-	-

DS-J AND DS-H SERIES – FLANGED CONNECTION, REMOTE MOUNT DIAPHRAGM  
SEALS WITH FLUSH OR EXTENDED DIAPHRAGM



The DS-J and DS-H with remote mount, flush or extended diaphragm seals are used with all the pressure transmitters with structures prepared for Schneider Electric diaphragm seals. The transmitter can be mounted in a remote location with interconnecting capillary lengths up to 15 m (50 ft). This transmitter-seal system provides a precise measurement.

**Temperature Limits - Fill Fluids**

Refer to “Diaphragm Seal Common Model Code (DC-)” on page 6.

**Connection to Transmitter**

Capillaries are provided in lengths from 1 to 15 m (3 to 50 ft) with 316 Series flexible armor. The armor is provided with or without a protective coat.

**Process-Wetted Materials**

See model code selections.

**Seal Orientation**

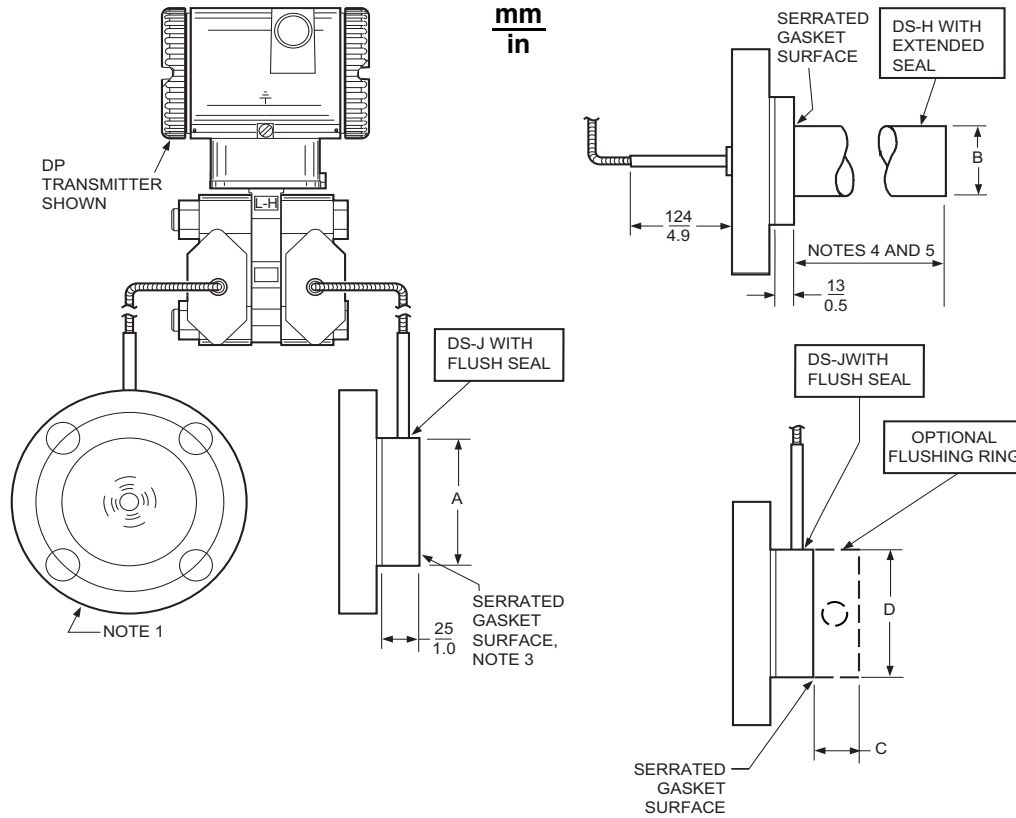
One or two seals, depending on the transmitter used. See model codes.

**Process Pressure-Temperature Limits - ANSI and DIN/BS Flanges**

Refer to the following standards: ANSI/ASME B16.5; EN 1092-1; and JIS 10K, 16K, and 20K.



DS-J and DS-H Dimensions - Nominal



Dimensions “A” and “B”

Seal Type	Flange Size	Dim. “A” Flush	Dim. “B” Extended
Flush or Extended	$\frac{50}{2}$	$\frac{99}{3.9}$	$\frac{47.3}{1.90}$
Flush or Extended	$\frac{80}{3}$	$\frac{132}{5.2}$	$\frac{72.4}{2.85}$
Extended Only	$\frac{100}{4}$	N/A	$\frac{94}{3.7}$

Dimensions “C” and “D”

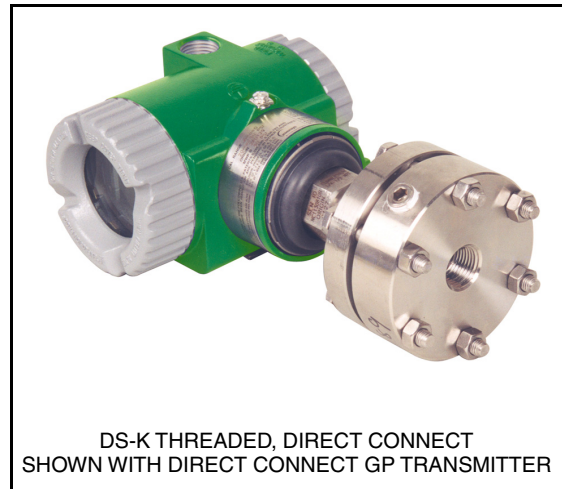
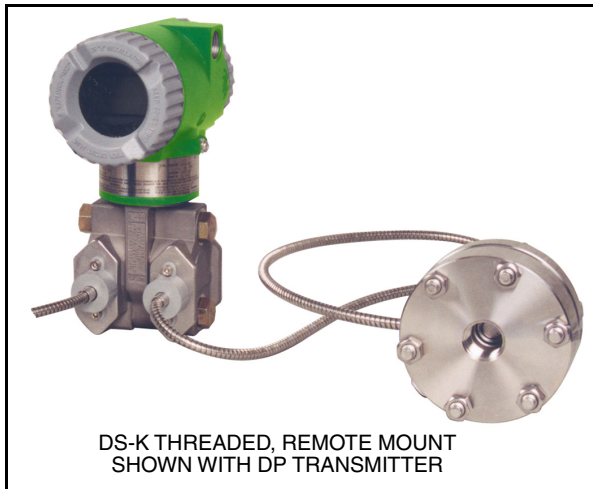
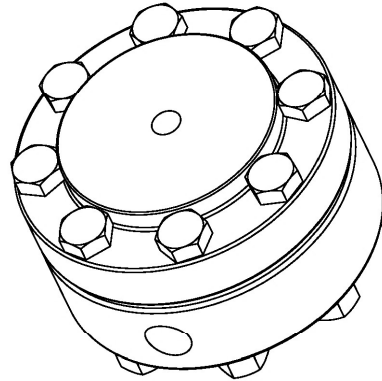
Seal Type	ANSI Flange	NPT Flushing Conn.	Dim. “C”	Dim. “D”
Flush	2 inch	$\frac{1}{4}$ inch	1.00	3.62
		$\frac{1}{2}$ inch	1.50	3.62
	3 inch	$\frac{1}{4}$ inch	1.00	5.00
		$\frac{1}{2}$ inch	1.50	5.00

Notes

1. Flange dimensions are per ANSI or DIN/BS standards.
2. See applicable transmitter Dimensional Print for transmitter dimensions.
3. Gasket surface has serrated finish, except for tantalum seals.
4. Extended diaphragm is suitable for up to schedule 80 unlined pipe nozzle.
5. 50 mm (2 in), 100 mm (4 in), or 150 mm (6 in) extension, as specified.

THREADED DIAPHRAGM SEALS - MODEL DS-K

Figure 10. DS-K (Threaded Diaphragm Seal)



The DS-K with remote mount, threaded, recessed diaphragm seals, is used with all the pressure transmitters with structures prepared for Schneider Electric diaphragm seals. The transmitter can be mounted in a remote location with interconnecting capillary lengths up to 15 m (50 ft). The DS-K with direct connect, threaded seals, is used with the direct connect AP and GP transmitters. These transmitter-seal systems are used when a threaded connection to the process is required, along with precise measurements.

**Pressure-Temperature Limits**

Refer to Table 11.

**Temperature Limits - Fill Fluids**

Refer to "Diaphragm Seal Common Model Code (DC-)" on page 6.

**Seal Orientation**

Seal can be on HI or LO side, or both sides depending on transmitter used. See Model Code.

**Process Wetted Materials**

See model code selections.

**Connection to Transmitter**

**Remote Mount**

Low volume; welded to capillary connection at both the transmitter and seal.

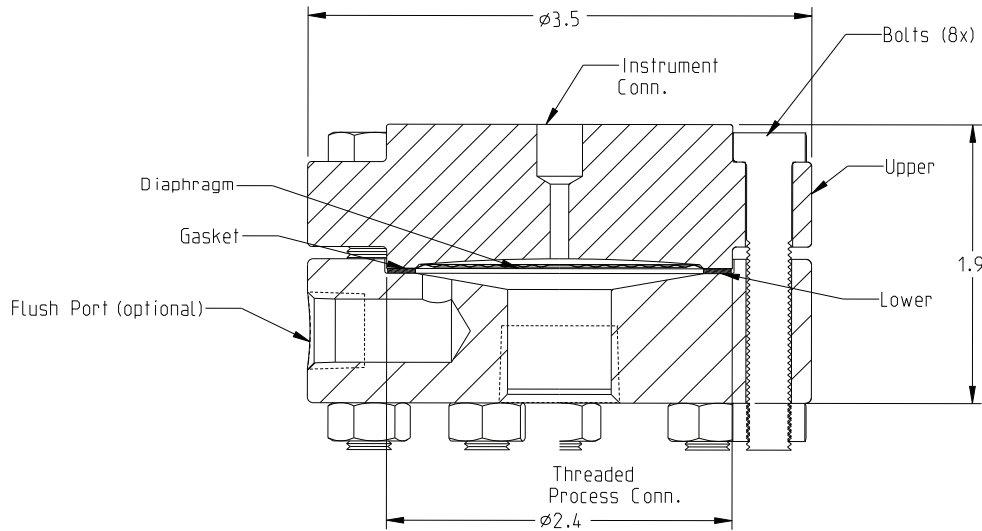
**Direct Connect**

Bolted for DP style and biplanar AP/GP.

**Connection to Process**

The seal is connected to the process with 1/4 through 1 NPT, and G1/4 through G1 internal and external (male and female) threads located on the lower housing. A transmitter mounting bracket is recommended when using a direct connected transmitter with the NPT connection.

**DS-K Nominal Dimensions, Threaded Seal, 2.4" Diaphragm with 1/2 FNPT Process Connection and 1/4 NPT Flush Port**



NOTE: 1/2" NPT Flushing only available in 2.9" and 4.1" Diaphragm

MODEL CODE – DS-K DIAPHRAGM SEALS

Description	Model
Threaded Diaphragm Seal	DS-K
<b>Threaded Connection</b>	
G 1/4 Female	AA
G 1/4 Male	AB
G 3/8 Female	AC
G 3/8 Male	AD
G 1/2 Female	AE
G 1/2 Male	AF
G 3/4 Female	AG
G 3/4 Male	AH
G 1 Female	AJ
G 1 Male	AK
1/4 NPT Female	AP
1/4 NPT Male	AQ
3/8 NPT Female	AY
3/8 NPT Male	AR
1/2 NPT Female	AS
1/2 NPT Male	AT
3/4 NPT Female	AU
3/4 NPT Male	AV
1 NPT Female	AW
1 NPT Male	AX
<b>Nominal Pressure Rating (see Table 11)</b>	
5.17 MPa (750 psi)	A
8.27 MPa (1,200 psi)	B
8.62MPa (1,250 psi)	C
10.34 MPa (1,500 psi)	D
13.79 MPa (2,000 psi)	E
17.24 MPa (2,500 psi)	F
22.06 MPa (3,200 psi)	G
27.58 MPa (4,000 psi)	H
34.47 MPa (5,000 psi)	J
55.16 MPa (8,000 psi)	K
68.95 MPa (10,000 psi)	L
<b>Diaphragm Diameter (see Table 11)</b>	
2.4 inches	3
2.9 inches	5
4.1 inches	8
<b>Upper Body Material (a)</b>	
Carpenter 20 UNS N08020	D
Carbon Steel (1018) UNS G10180 (b)	1
Stainless Steel (316L) UNS S31603 (b) (c)	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-276 UNS N10276	E
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Titanium Grade 2 UNS R50400	X
Zirconium 702 UNS R60702	M

MODEL CODE – DS-K DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Diaphragm Material (a) (b) (d)</b>	
Carpenter 20 UNS N08020	D
Stainless Steel (316L) UNS S31603	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-22 UNS N06022	T
Nickel Alloy C-276 UNS N10276	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Titanium Grade 4 UNS R50700 (c)	L
Nickel UNS N02200	N
Tantalum UNS R05200 (c) (e)	P
Zirconium 702 UNS R60702 (c)	M
<b>Wetted Parts Coating</b>	
No Coating	Z
Gold Plated (50 μinch) (f)	6
Double Gold Plated (100 μinch) (f)	7
PFA Coating 0.15 mm (Antistatic) (f)	B
<b>Lower Part Material (d)</b>	
Stainless Steel (316L) UNS S31603 (e)	A
Stainless Steel (321) UNS S32100	V
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Nickel Alloy C-276 UNS N10276 (e)	E
Inconel 600 UNS N06600	H
Inconel 625 UNS N06625	J
Incoloy 825 UNS N08825	U
Monel 400 UNS N04400	K
Nickel UNS N02200	N
Titanium Grade 2 UNS R50400	X
Carpenter 20 UNS N08020	D
Zirconium 702 UNS R60702	M
<b>Gasket</b>	
PTFE max. 260°C (500°F)	P
Statotherm (Graphit) max. 400°C (752°F)	S
Klinger C-4401 max. 232°C (450°F)	K
Gylon 3510 max. 260°C (500°F)	O
Buna-N max. 121°C (250°F)	Q
Kalrez max. 316°C (601°F)	R
EPDM max. 149°C (300°F)	E
Top Chem 2000 max. 249°C (480°F)	T
PTFE Encap Viton max. 149°C (300°F)	U
Grafoil max. 200°C (392°F)	M
FPM max. 200°C (392°F)	V
<b>Fastening Parts (see Table 11)</b>	
Bolts in Carbon Steel (Grade 8 Zinc)	H
Bolts in 304L Stainless Steel	I
A193 B7M NACE Fasteners	J

MODEL CODE – DS-K DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Flushing Connection</b>	
None	Z
1 x 1/4 NPT Female	2
2 x 1/4 NPT Female	5
1 x 1/2 NPT Female	3
2 x 1/2 NPT Female	6
Welded Hand Valve (Single)	7
Welded Hand Valve (Dual)	8
<b>Sealing Screw on Flushing Connection (g)</b>	
None	Z
1 Sealing Screw	1
2 Sealing Screws	2
<b>Optional Selections</b>	
NACE MR0103/MR0175 (h)	-N
Material Certification per EN 10204 3.1	-M
Pressure Test Certificate (1.5 times MWP for 10 minutes)	-P
Calibration Certificate (0, 25, 50,75, 100, 75, 50, 25, 0)	-C
Dual Seal Order on High Side (i)	-1
Dual Seal Order on Low Side (i)	-2

- a. Diaphragm Material same as Upper Body Material except as in notes (c), (b).
- b. All Diaphragm Materials available with Upper Body Materials Carbon Steel and Stainless Steel (selections 1, A).
- c. Diaphragm Materials Titanium, Tantalum and Zirconium (selections L, M, P) only available with Upper Body Material 316L SS (selection A).
- d. Lower Part Material must be used with the same Diaphragm Material, except for note (e).
- e. Lower Part Material Stainless Steel and Nickel Alloy (selections A, E) available with Diaphragm Material Tantalum (selection P).
- f. Wetted Parts Coatings Gold Plated, Double Gold Plate, and PFA (selections 6, 7, B) not available with Diaphragm Materials Titanium, Tantalum and Zirconium (selections L, M, P).
- g. Flushing Screw Material is the same as Lower Housing Material.
- h. Diaphragm Materials Titanium, Zirconium (selections L, M) not available with Option NACE (selection N).
- i. Optional selections -1 and -2 are for buyautomation.com and internal use only.

Table 11. Diaphragm Diameters, Pressure Ratings, and Fastening Options for DS-K (a) (b)

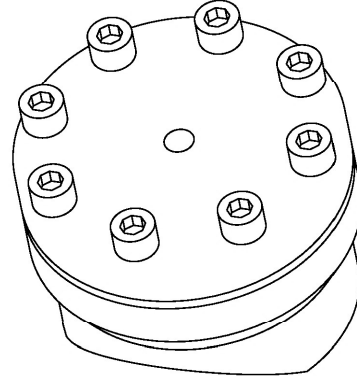
Pressure Rating (PSI)	750	1200	1250	1500	2000	2500	3200	4000	5000	8000
<b>Fastening</b>	<b>2.4" Diaphragm Diameter</b>									
Grade 8 Zinc	-	-	-	-	-	Yes	-	-	Yes	-
304L SS	-	-	Yes	-	-	Yes	-	-	Yes	-
A193 B7M NACE	-	-	-	-	Yes	-	-	Yes	-	Yes
<b>Fastening</b>	<b>2.9" Diaphragm Diameter</b>									
Grade 8 Zinc	-	-	-	-	-	Yes	-	-	Yes	-
304L SS	-	-	Yes	-	-	Yes	-	-	-	-
A193 B7M NACE	-	-	-	-	Yes	-	-	Yes	-	-
<b>Fastening</b>	<b>4.1" Diaphragm Diameter</b>									
Grade 8 Zinc	-	-	-	Yes	-	-	-	Yes	-	-
304L SS	Yes	-	-	-	-	-	-	-	-	-
A193 B7M NACE	-	Yes	-	-	-	-	Yes	-	-	-

a. The maximum temperature allowed with a direct connection is 400°F (204°C).

b. The maximum temperature allowed with remote mounting is 580°F (304°C).

IN-LINE SADDLE WELD DIAPHRAGM SEALS - MODEL DS-L

Figure 11. DS-L (In-Line Saddle Weld Diaphragm Seal)



*The DS-L with remote mount, in-line welded, recessed diaphragm seals, is used with all the pressure transmitters with structures prepared for Schneider Electric diaphragm seals. The DS-L with direct mount, in-line welded seals, is used with the direct connect AP and GP transmitters. These transmitter-seal systems are used in applications that require a continuous process flow across the diaphragm to help ensure that pressure sensing is not inhibited by buildup of solids.*



### **Process Pressure-Temperature Limits**

The maximum working pressure is equivalent to a nominal 3- or 4-inch Schedule 40 pipe as defined by ASME/ANSI standards. Do not exceed this pressure rating, nor the temperature limits of the fill fluid selected.

### **Temperature Limits - Fill Fluids**

Refer to “Diaphragm Seal Common Model Code (DC-)” on page 6.

### **Process Wetted Materials**

See model code selections.

### **Seal Orientation**

Seal can be on HI or LO side, or both sides depending on transmitter. See Model Code.

### **Connection to Transmitter**

#### **Remote Mount**

Low volume; welded capillary connection at the transmitter and the seal.

#### **Direct Mount**

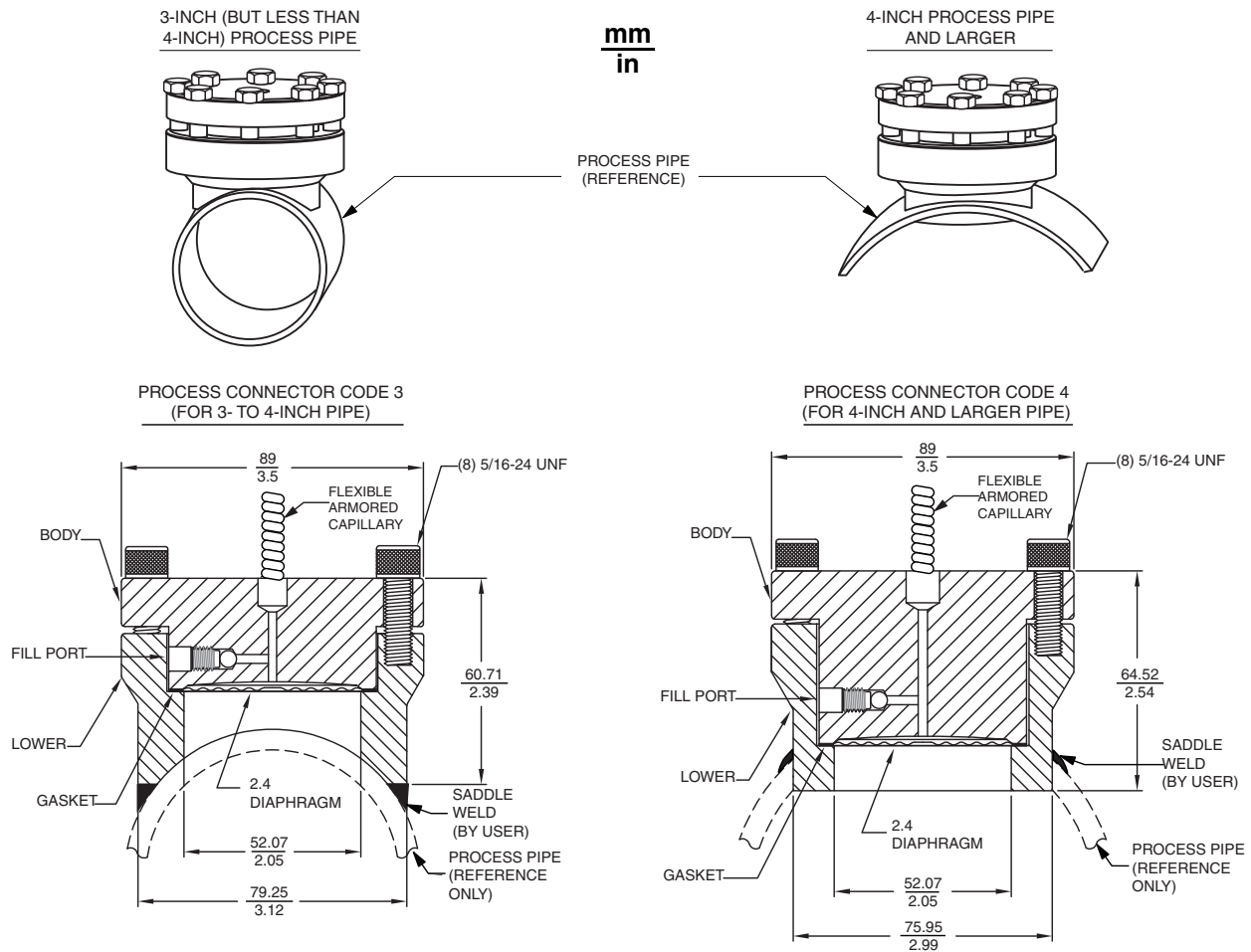
A ½ NPT internal thread on upper housing directly connects to a direct connect AP and GP transmitter.

### **Connection to Process**

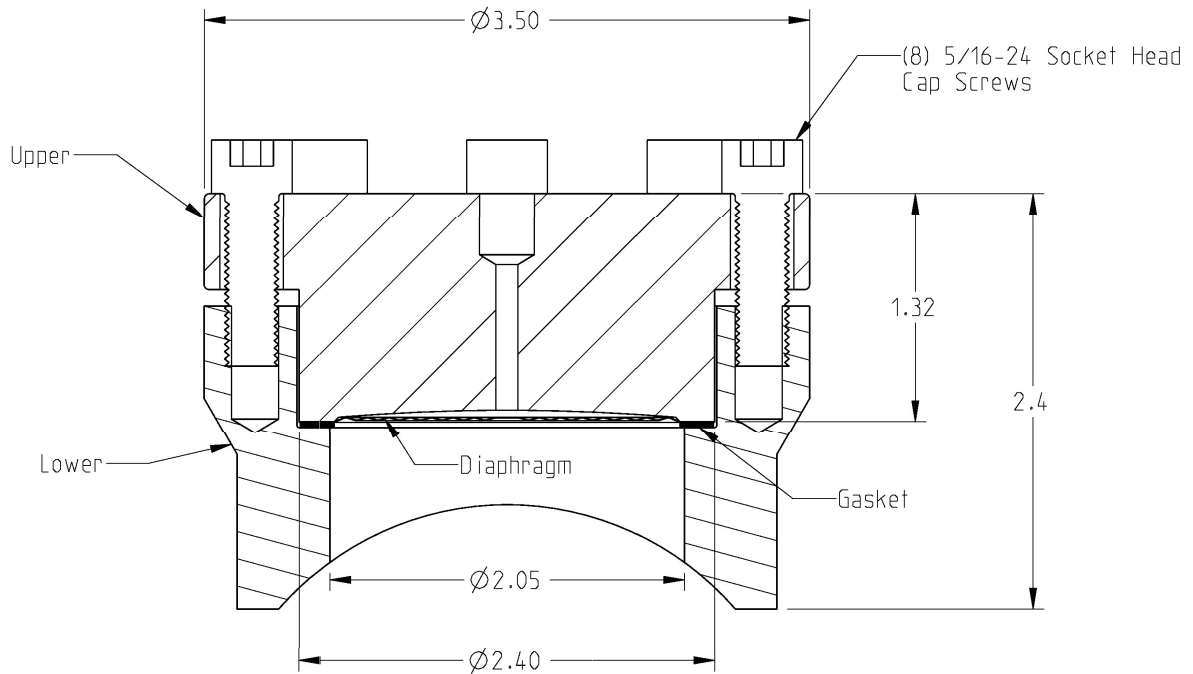
The lower housing of the seal is in-line, saddle welded to a nominal 3- or 4-inch (and larger) pipe. After welding the lower section to the pipe, the upper section (which has the diaphragm welded to it) is then bolted to the lower section.

**Dimensions - Nominal**

Also see DPs 020-349 and 020-350.



**DS-L Nominal Dimensions, In-Line Saddle Seal for 3" Pipe, Lower Housing Included**



**MODEL CODE – DS-L DIAPHRAGM SEALS**

Description	Model
Flanged Flush Diaphragm Seal (One Piece Construction)	DS-L
<b>Process Connection Specification</b>	
3 inch Pipe	C
4 inch Pipe	D
<b>Diaphragm Diameter</b>	
2.4 inch Diameter	2
<b>Nominal Pressure Rating</b>	
1250 psi	C
2500 psi (a)	E
<b>Upper/Main Body Material (b)</b>	
Stainless Steel (316L) UNS S31603	A
Duplex 2205 UNS S31803	Q
Nickel Alloy C-276 UNS N10276	E
Titanium Grade 2 UNS R50400 (must have Titanium Diaphragm)	X
Zirconium 702 UNS R60702 (must have Zirconium Diaphragm)	M
<b>Diaphragm Material (b) (c)</b>	
Stainless Steel (316L) UNS S31603	A
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Inconel 600 UNS N06600	H
Nickel Alloy C-276 UNS N10276	E
Monel 400 UNS N04400	K
Titanium Grade 4 UNS R50700 (d) (e)	L
Tantalum UNS R05200 (d) (g)	P

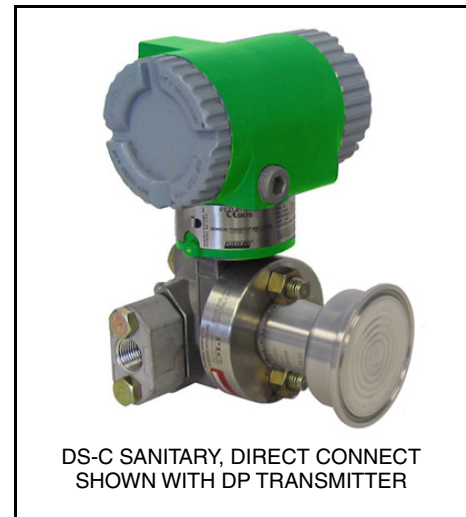
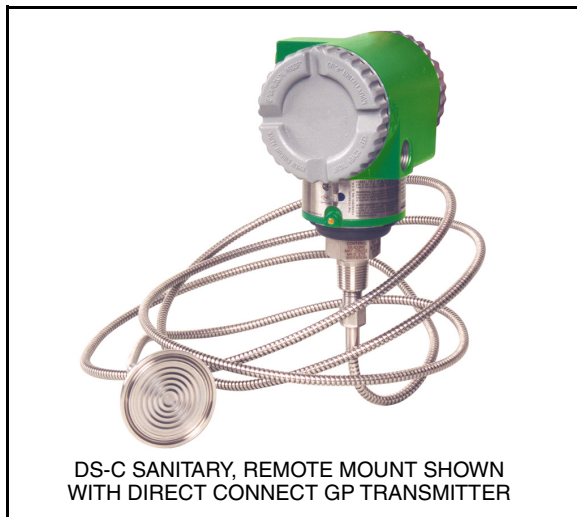
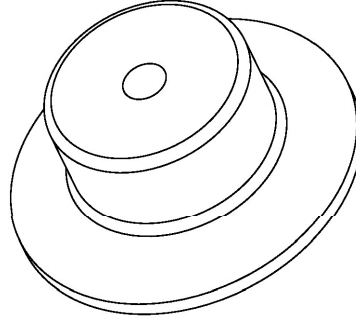
MODEL CODE – DS-L DIAPHRAGM SEALS (CONTINUED)

Description	Model
Zirconium 702 UNS R60702 (d) (e)	M
<b>Lower Part Material (c)</b>	
None (does not include Lower) (f)	4
Stainless Steel (316L) UNS S31603 (g)	A
Duplex 2205 UNS S31803	Q
Super Duplex 2507 UNS S32750	R
Inconel 600 UNS N06600	H
Nickel Alloy C-276 UNS N10276 (g)	E
Monel 400 UNS N04400	K
Titanium Grade 2 UNS R50400 (must have Titanium Diaphragm)	X
Nickel UNS N02200	N
Zirconium 702 UNS R60702 (must have Zirconium Diaphragm)	M
<b>Wetted Parts Coating</b>	
None	Z
Gold Plated (50 μinch) (d)	6
Double Gold Plated (100 μinch) (d)	7
PFA Coating 0.15 mm (Antistatic) (d)	B
<b>Gasket</b>	
None (f)	Z
PTFE max. 260°C (500°F)	P
Grafoil max. 400°C (752°F)	S
Klinger C-4401 max. 232°C (450°F)	K
Gylon max. 260°C (500°F)	O
Buna-N max. 121°C (250°F)	Q
Kalrez max. 316°C (601°F)	R
EPDM max. 149°C (300°F)	E
Top Chem 2000 max. 249°C (480°F)	T
PTFE Encap Viton max. 149°C (300°F)	U
VITON FPM max. 200°C (392°F)	V
<b>Fastening Parts</b>	
Bolts in Steel (Grade 8 Zinc) (a)	H
Bolts in 304L Stainless Steel	I
<b>Optional Selections</b>	
NACE MR0103/MR0175 (e)	-N
Material Certification per EN 10204 3.1	-M
Pressure Test Certificate (1.5 times MWP for 10 minutes)	-P
Calibration Certificate (0, 25, 50,75, 100, 75, 50, 25, 0)	-C
Dual Seal Order on High Side (h)	-1
Dual Seal Order on Low Side (h)	-2

- a. Nominal Pressure Rating 2500 (selection E) must use Fastening Parts Bolts in Steel (selection H).
- b. Upper/Main Body Material must be 316 SS (selection A), or Upper Main Body Material and Diaphragm Material must have the same material type selections.
- c. Diaphragm Material must be the same as Lower Part Material except for Tantalum, see note (g).
- d. Wetted Parts Coating Gold, PFA (selections 6, 7, B) not available with Diaphragm Materials Tantalum, Titanium, and Zirconium (selections X, P, L, M).
- e. Diaphragm Materials Titanium, Zirconium (selections L, M) not available with Option NACE (selection N).
- f. Gasket Material None (selection Z) must be selected with Lower Part Material None (selection 4).
- g. Diaphragm Material Tantalum (selection P) available with Lower Part Materials 316L SS and Nickel Alloy C-276 (selections A, E).
- h. Optional selections -1 and -2 are for buyautomation.com and internal use only.

SANITARY, TRI-CLAMP DIAPHRAGM SEALS - MODEL DS-C

Figure 12. DS-C (Sanitary Tri-Clamp Diaphragm Seal)



The DS-C with remote mount, flush diaphragm seals are used with all the pressure transmitters with structures prepared for Schneider Electric diaphragm seals. The DS-C with direct mount, flush diaphragm seals are used with the DP and biplanar GP transmitters. These sanitary seals meet 3-A Sanitary Standards. The seal surface finish can be either 32 Ra or 15 Ra, as specified. They attach to the process connection and are fastened with a Tri-Clamp type connector. Refer to the applicable transmitter PSS in Table 2.

**Process Pressure-Temperature Limits**

The maximum working pressure of the seal process connection varies with the customer-supplied sanitary clamping device. Refer to the Tri-Clamp type connector specifications to determine the pressure-temperature limits of the clamping system that you are using. Do not exceed the Tri-Clamp type connector limits, nor the temperature limits of the seal and capillary fill fluid selected.

**Temperature Limits - Fill Fluids**

Refer to “Diaphragm Seal Common Model Code (DC-)” on page 6.

**Seal Surface Finish**

The 32 Ra seal surface finish is applicable to most sanitary industry applications. The 15 Ra seal finish is particularly applicable to the Biopharmaceutical and Pharmaceutical industries.

**Process Wetted Materials**

See model code selections.

**Connection to Process**

For remote mounting, the diaphragm is welded to the process end of the seal, which provides a sanitary process connection to mate with the process connection. You then use a Tri-Clamp type connector and gasket to attach the seal to the process.

For direct connection, a customer-supplied Tri-Clamp type connector and gasket fasten the seal to the mating process connector.

The clamp size and fill fluid determine the pressure-temperature limits of the seal system.

**Connection to Transmitter**

For remote mounting: low volume, welded capillary connection at both instrument and seal (some models may have capillary threaded at seals).

For direct connection: seal bolted to high pressure side of transmitter and sealed with a metallic self-energizing o-ring, thus forming an integral transmitter/seal assembly.

**Seal Orientation**

Seal can be on HI or LO side, or both sides, depending on transmitter model used.

**Ambient Temperature Effect and Response Time**

**Table 12. Ambient Temperature Effect - Transmitter with Direct Connect DS-C Seal Total Effect for a 28°C (50°F) Change within Normal Operating Conditions**

Transmitter Span Limit Code (a)	Total Ambient Temperature Effect for Transmitters with:
	Electronics Versions -T, -F, -M, and -V (b)
B and C	$\pm(0.03\% \text{ URL} + 0.060\% \text{ Span} + \text{“X”})$
D only	$\pm(0.05\% \text{ URL} + 0.045\% \text{ Span} + \text{“X”})$
E only	$\pm(0.08\% \text{ URL} + 0.025\% \text{ Span} + \text{“X”})$

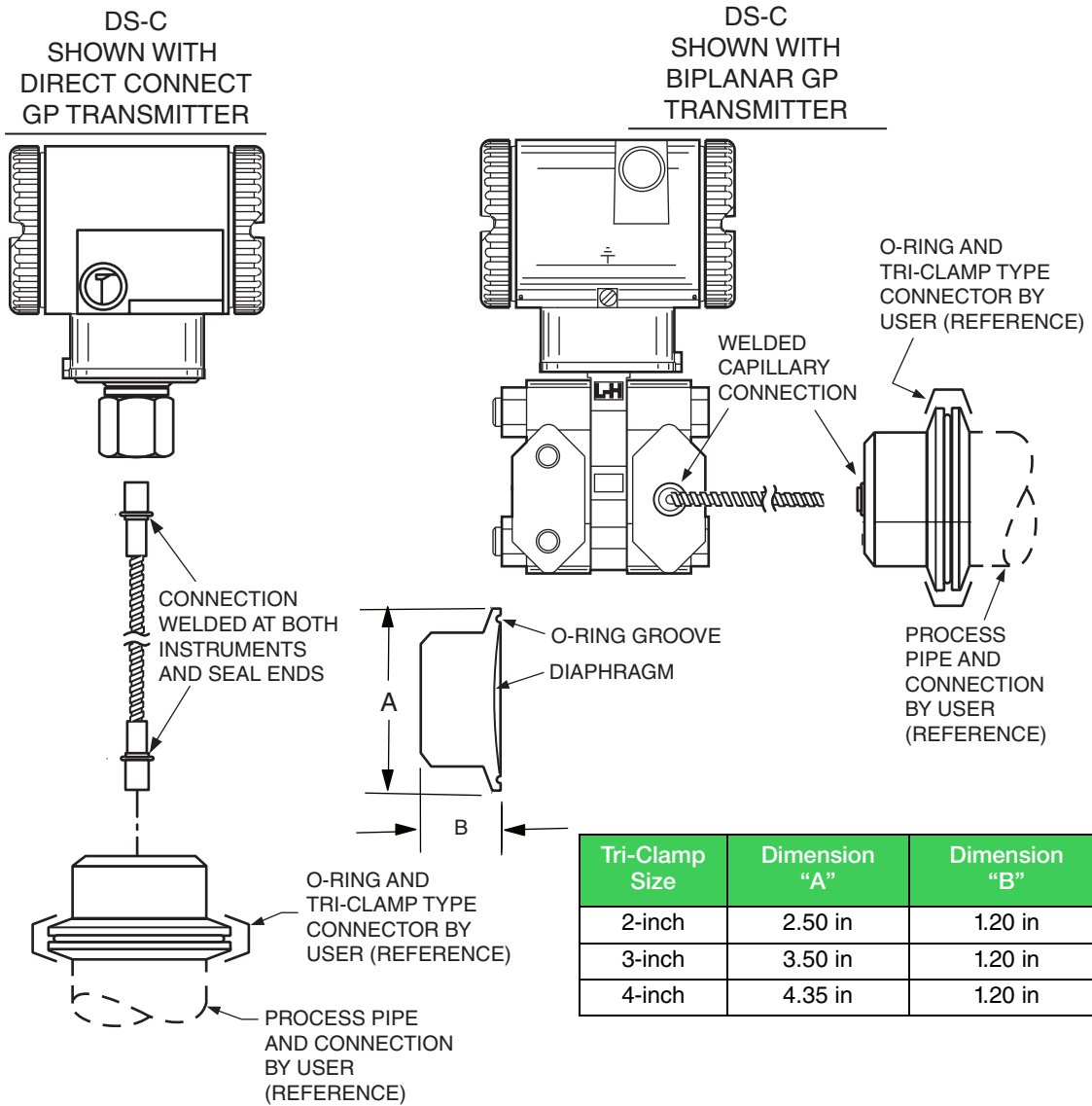
- a. Diaphragm seals are not applicable to transmitter Span Limit Code A.
- b. URL, Span, and “X” must be in identical units. See Table 13 for Values of “X”.

**Table 13. Values of “X” for Ambient Temperature Effect Specifications**

Connection Size	Seal Fill Fluid	Value of “X” for Transmitter with a DS-C Seal	
		mmH <sub>2</sub> O	inH <sub>2</sub> O
2-in Tri-Clamp Type	NEOBEE M-20	107	4.2
3-in Tri-Clamp Type	NEOBEE M-20	51	2.0

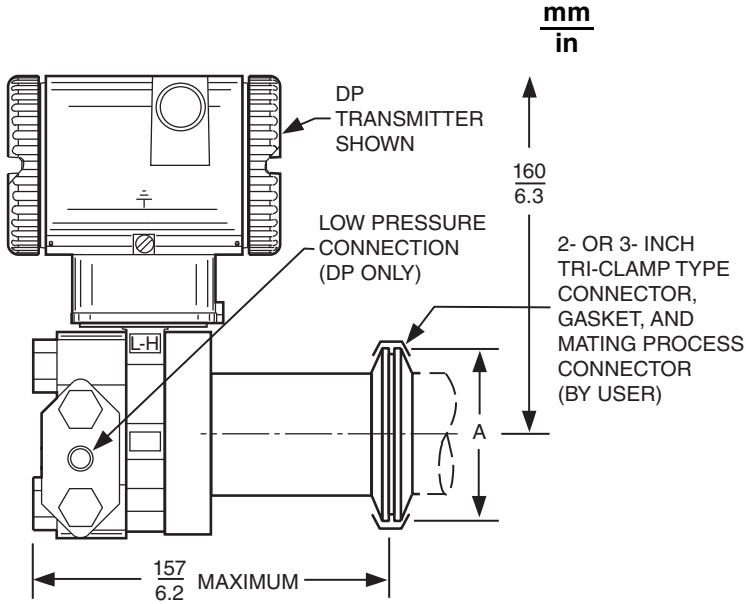
**DS-C Dimensions - Nominal**

Also see DP 020-351.



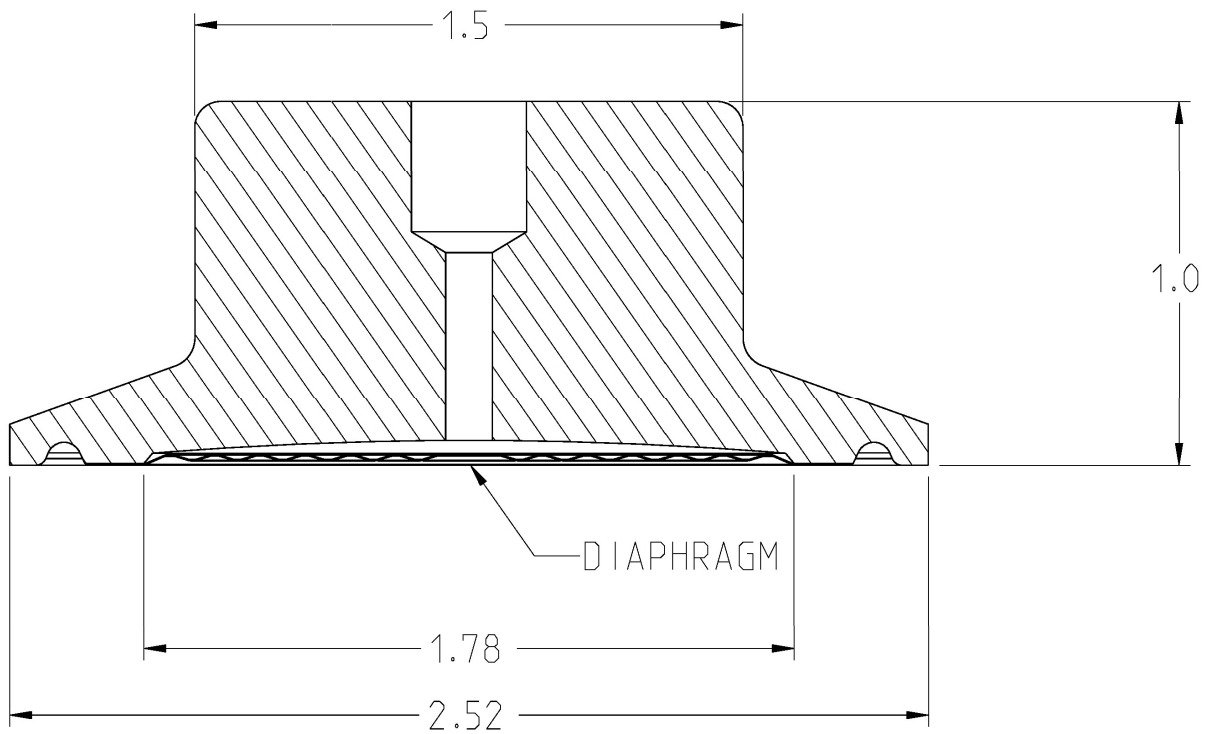
**DS-C Dimensions - Nominal**

Also see DP 020-355.



Tri-Clamp Size	Dimension "A"
2-inch	2.50 in
3-inch	3.60 in

**DS-C Nominal Dimensions, Sanitary Tri-Clamp with 2" Clamp**





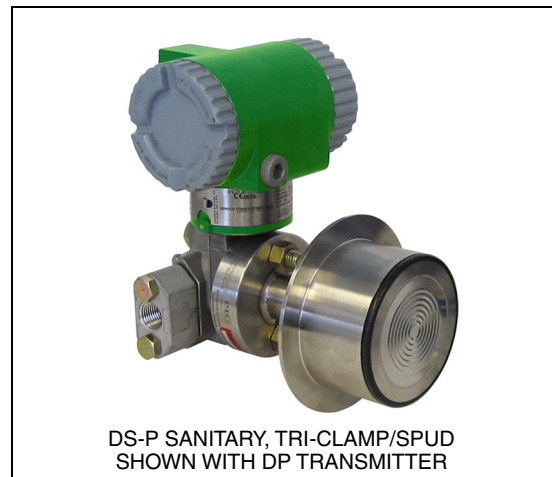
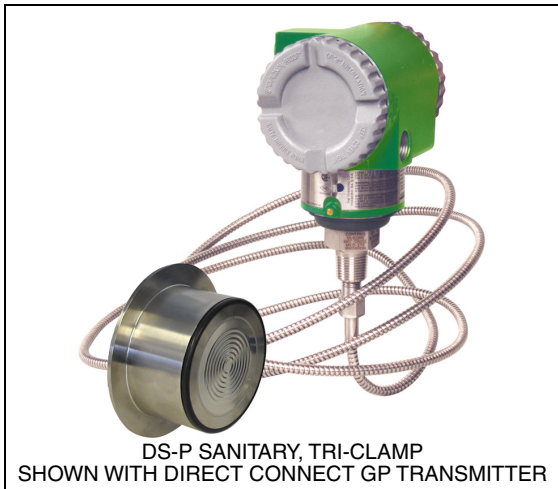
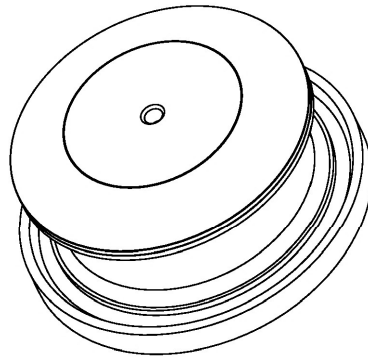
MODEL CODE – DS-C DIAPHRAGM SEALS

Description	Model
Sanitary Tri-Clamp Diaphragm Seal (a) (b) (c)	DS-C
<b>Pipe Standard</b>	
Pipe Dimensions per DIN 11866 Row C or ASME BPE	D
<b>Process Connection</b>	
1 inch (pipe dimensions 25.4 x 1.65 mm)	AR
1.5 inches (pipe dimensions 38.1 x 1.65 mm)	AS
2 inches (pipe dimensions 50.8 x 1.65 mm)	AT
2.5 inches (pipe dimensions 63.5 x 1.65 mm)	AU
3 inches (pipe dimensions 76.2 x 1.65 mm)	AV
4 inches (pipe dimensions 101.6 x 2.11 mm)	AW
<b>Upper Body Material (d)</b>	
316L Stainless Steel UNS S31603	A
316L Electropolished Stainless Steel UNS S31603 (e)	Y
Nickel Alloy C-276 UNS N10276	E
<b>Diaphragm Material (d)</b>	
316L Stainless Steel UNS S31603	A
316L Electropolished Stainless Steel UNS S31603 (e) (f)	Y
Nickel Alloy C-276 UNS N10276	E
<b>Surface Roughness Wetted (Welding Seam Not Included)</b>	
Ra ≤ 0.76 μm (Ra 30 μinch) per ASME BPE SF3	A
Ra ≤ 0.38 μm (Ra 15 μinch) per ASME BPE SF4 (e)	B
<b>Optional Selections</b>	
NACE MR0103/MR0175	-N
Material Certificate per EN 10204 3.1	-M
Pressure Test Certificate	-P
Calibration Certificate (0, 25, 50, 75, 100, 75, 50, 25, 0)	-C
3-A Certificate (g)	-A
Electropolish Certificate (f)	-E
Dual Seal Order on High Side (h)	-1
Dual Seal Order on Low Side (h)	-2

- a. When Diaphragm Seal Instrument Connection Capillary Selection is R (Remote Welded Capillary), armored capillary with protective coat selections (capillary types BA – BQ) must be ordered and used (example: DC-RB4BBJ). Capillary types AA – AQ may not be ordered or used.
- b. Diaphragm Seal Instrument Fill Fluid selection J (Neobee M20) must be ordered (example: DC-RB4BBJ).
- c. When DS-C is selected for Pressure transmitters with Model Code Option -N3 (3-A Sanitary Compliant), Transmitter Electrical Certification selections CA,CM,CN,FA,FM,FN or ZZ only can be ordered (examples: IGP10S-TS3D1FA-N3, IDP10S-TS1B01CN-N3).
- d. Upper Body Material and Diaphragm Material must have the same material type selections.
- e. Surface Roughness Wetted Part: Ra ≤ 0.38 μm (Ra 15 μinch) according to ASME BPE SF4 (selection B) only available with Diaphragm Material 316L Stainless Steel, 316L Electropolished Stainless Steel (selections A, Y) and Upper Body Materials 316L Stainless Steel, 316L Electropolished Stainless Steel (selections A, Y).
- f. Optional selection Electropolish Certificate (selection -E) only available with Diaphragm Material 316L Electropolished Stainless Steel (selection Y).
- g. DS-C Option -A only available with Pressure transmitters Model Codes that include Option -N3/3-A Sanitary Compliant (example: IGP10S-TP3D1CA-N3).
- h. Optional selections -1 and -2 are for buyautomation.com and internal use only.

**SANITARY, TRI-CLAMP TO STANDARD SPUD OR MINI SPUD DIAPHRAGM SEALS -  
MODEL DS-P**

Figure 13. DS-P (Tank Spud Diaphragm Seal)



The DS-P diaphragm seals with remote mounting are capillary connected, sanitary seals with extended diaphragm for installation on mating tank spuds. They are used with all the pressure transmitters with structures prepared for Schneider Electric diaphragm seals. The DS-P diaphragm seals with direct connections have extended diaphragm sanitary seals for tank spud installations. They are used with DP and biplanar GP transmitters.

**Process Pressure-Temperature Limits**

The maximum working pressure of the seal process connection varies with the sanitary clamping device. Refer to Tri-Clamp type standards to determine the pressure-temperature limits of the clamping system that you are using. Do not exceed the Tri-Clamp type connector limits, nor the temperature limits of the seal and capillary fill fluid selected.

**Temperature Limits - Fill Fluids**

Refer to “Diaphragm Seal Common Model Code (DC-)” on page 6.

**NOTE**

DS-P with EPDM o-ring as supplied is limited to 121°C (250°F).

**Process Wetted Materials**

See model code selections.

### Connection to Transmitter

#### Remote Connect

Low volume, metal-to-metal threaded seal at transmitter. Welded at the seal. Capillary has 0.04-in inside diameter.

#### Direct Connect

Bolted, with self-energizing o-ring.

### Connection to Process

The seal is connected to the mating tank spud using a Tri-Clamp type connector. The clamp (with gasket) is provided as part of the transmitter/seal assembly. Tank spuds are offered as accessories if you do not

have an existing spud. The clamp and fill fluid selected determine the pressure-temperature limits of the seal system.

### Seal Orientation

Seal can be on HI or LO side, or on both sides as a balanced two-seal system, depending on transmitter model used. See Model Code.

### Seal Surface Finish

The seal surface finish can be either 32 Ra or 15 Ra, as specified. The 32 Ra finish is applicable to most sanitary industry applications. The 15 Ra seal finish is particularly applicable to the biopharmaceutical and pharmaceutical industries.

## Ambient Temperature Effect - Transmitter with DS-P Seal

Table 14. Total Effect for a 28°C (50°F) Change within Normal Operating Conditions

Transmitter Span Limit Code (a)	Total Ambient Temperature Effect for Transmitter with DS-P Seal and:
	Electronics Versions “-T”, “-F”, and “-V” (b)
B and C	$\pm(0.03\% \text{ URL} + 0.060\% \text{ Span} + \text{“X”})$
D only	$\pm(0.05\% \text{ URL} + 0.045\% \text{ Span} + \text{“X”})$
E only	$\pm(0.08\% \text{ URL} + 0.025\% \text{ Span} + \text{“X”})$

a. Diaphragm seals are not applicable to transmitter Span Limit Code A.

b. URL, Span, and “X” must be in identical units. See Table 15 for Values of “X”.

Table 15. Values of “X” for Ambient Temperature Effect Specifications

Spud Size	Seal Fill Fluid	Value of “X” for Transmitter with a DS-P Seal	
		mmH <sub>2</sub> O	inH <sub>2</sub> O
2-in Mini	NEOBEE M-20	107	4.2
4-in Standard	NEOBEE M-20	13	0.5

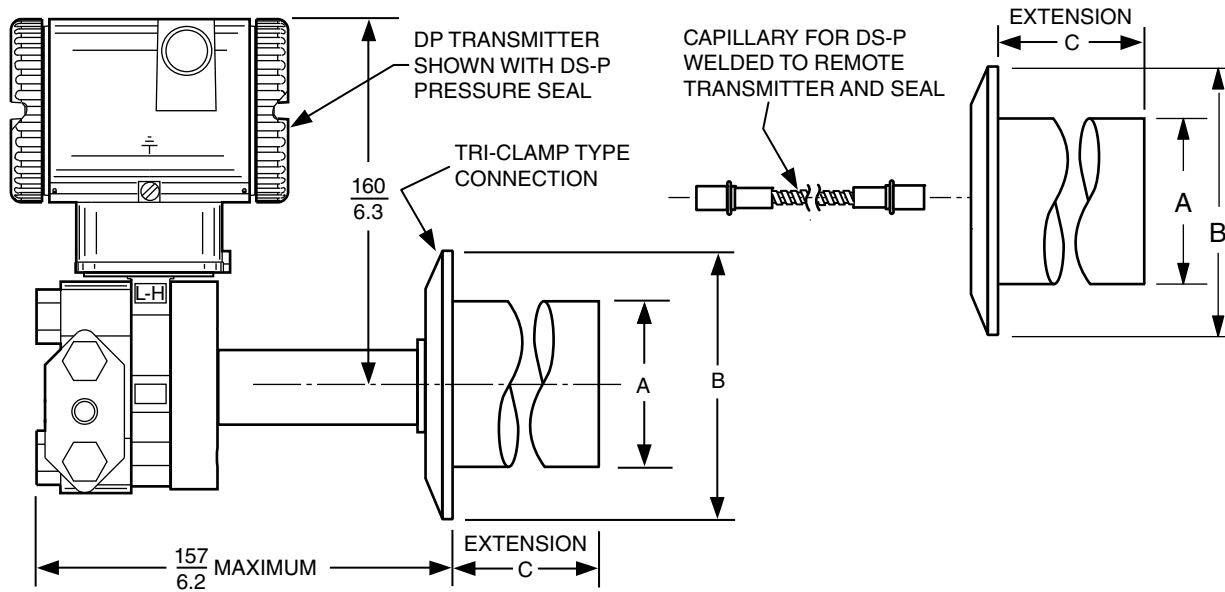
## Accessories for Use with DS-P Seals

Tank Spud Description	For Use with Structure Codes	Part Number	Dimensions in inches		
			A	B	C
Tank Spud - 2 inch Extension	4S2, 4R2	N1212AU	2.10	5.22	5.98
Tank Spud - 6 inch Extension	4S6, 4R6	N1212AV	6.10	5.22	5.98
Tank Spud - 1½ inch Extension	2S2, 2R2	N1212GG	1.50	3.05	3.73

Tank Spud Description	For Use with Structure Codes	Part Number	Dimensions in inches		
			A	B	C
Tank Spud - 6 inch Extension	2S6, 2R6	N1214BP	6.00	3.05	3.73
Tank Spud - 9 inch Extension	2S9, 4R9	N1214BQ	9.00	3.05	3.73

**Dimensions - Nominal**

Also see DP 020-353 and DP 020-354.

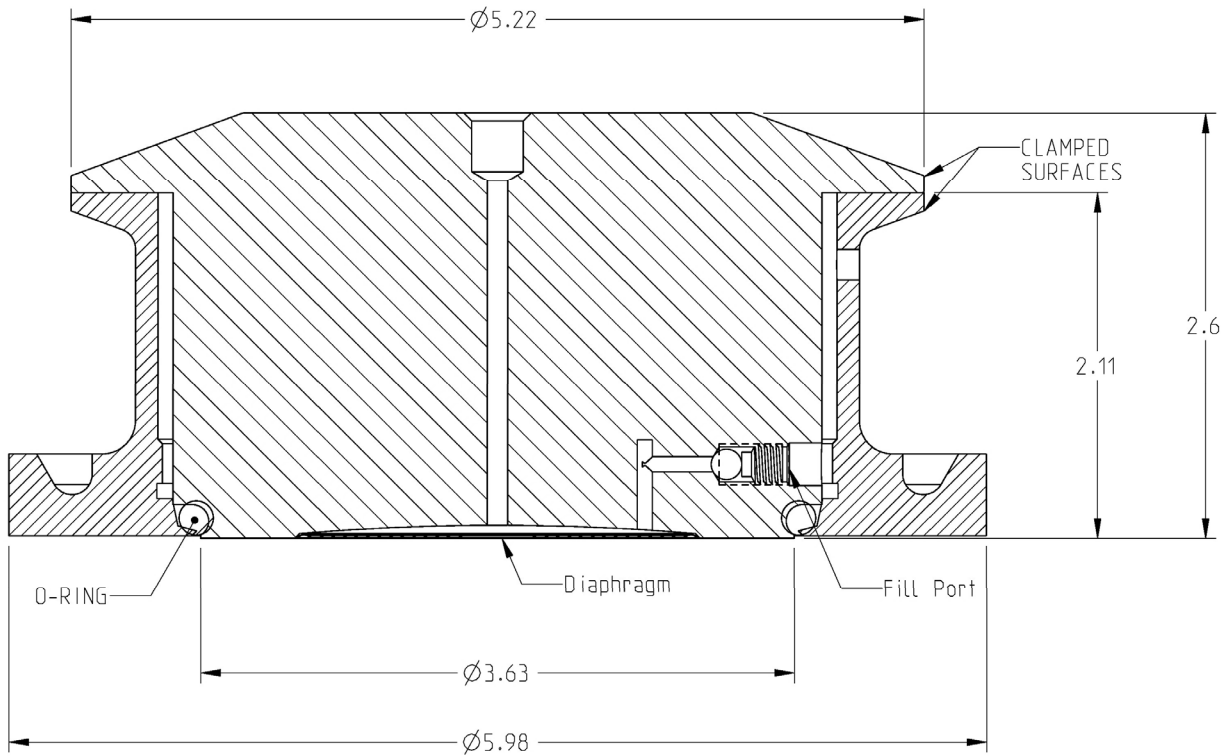


Spud Size (a)	Extension (Nominal)	Model Code	Dimensions (b)		
			A	B	C
4 in	2 in	4S2; 4R2	3.94	5.22	2.03
4 in	6 in	4S6; 4R6	3.94	5.22	6.03
2 in	1½ in	2S2; 2R2	2.13	3.05	1.50
2 in	6 in	2S6; 2R6	2.13	3.05	6.00
2 in	9 in	2S9; 2R9	2.13	3.05	9.00

a. 2-inch Mini-Spud; 4-inch Standard Spud.

b. Dimensions are in inches.

DS-P Nominal Dimensions, Tank Spud for 2" Pipe and Extension Length of 2.11"



MODEL CODE – DS-P DIAPHRAGM SEALS

Description	Model
Tank Spud Diaphragm Seal (a) (b) (c)	DS-P
<b>Process Connection</b>	
2.5 inches (pipe dimensions 53.5 x 1.65) (d)	2
4 inches (pipe dimension 101.6 x 2.11) (e)	4
<b>Diaphragm Diameter</b>	
1.9 inches (d)	2
3.0 inches (e)	6
<b>Upper/Main Body Material (f)</b>	
316L Stainless Steel UNS S31603 (g)	A
316L Electropolished Stainless Steel UNS S31603 (g)	Y
Nickel Alloy C-276 UNS N10276	E
<b>Diaphragm Material (f) (h)</b>	
316L Stainless Steel UNS S31603 (g)	A
316L Electropolished Stainless Steel UNS S31603 (g) (i)	Y
Nickel Alloy C-276 UNS N10276	E
<b>Surface Roughness Wetted</b>	
Ra ≤ 0.76 μm (Ra 30 μinch) per ASME BPE SF3	A
Ra ≤ 0.38 μm (Ra 15 μinch) per ASME BPE SF4 (g)	B

MODEL CODE – DS-P DIAPHRAGM SEALS (CONTINUED)

Description	Model
<b>Extension Length</b>	
2.0 inches	2
4.0 inches	4
6.0 inches	6
<b>Ferrule</b>	
None	Z
316L Stainless Steel (h)	A
Nickel Alloy C-276 (h)	E
<b>Optional Selections</b>	
NACE	-N
Material Certificate per EN 10204 3.1	-M
Pressure Test Certificate	-P
Calibration Certificate (0, 25, 50, 75, 100, 75, 50, 25, 0)	-C
3-A Certificate (j)	A
Electropolish Certificate (i)	-E
Dual Seal Order on High Side (k)	-1
Dual Seal Order on Low Side (k)	-2

- a. When Diaphragm Seal Instrument Connection Capillary Selection is R (Remote Welded Capillary), armored capillary with protective coat selections (capillary types BA – BQ) must be ordered and used (example: DC-RB4BBJ). Capillary types AA – AQ may not be ordered or used.
- b. Diaphragm Seal Instrument Fill Fluid selection J (Neobee M20) must be ordered (example: DC-RB4BBJ).
- c. When DS-P Seal is selected for Pressure transmitters with Model Code Option -N3 (3-A Sanitary Compliant), Electrical Certification selections CA,CM,CN,FA,FM,FN or ZZ only can be ordered(examples: IGP10S-TS3D1FA-N3,IDP10S-TS1B01CN-N3).
- d. Diaphragm Diameter 1.9" (selection 2) only available with Process Connection 2.5 inches (selection 2).
- e. Diaphragm Diameter 3.0" (selection 6) only available with Process Connection 4 inches (selection 4).
- f. Upper/Main Body Material and Diaphragm Material must have the same material type selections.
- g. Surface Roughness Wetted Part  $Ra \leq 0.38 \mu m$  ( $Ra \leq 15 \mu inch$ ) according to ASME BPE SF4 (selection B) only available with Diaphragm Material 316L Stainless Steel, 316L Electropolished Stainless Steel (selections A, Y) and Upper Body Material 316L Stainless Steel, 316L Electropolished Stainless Steel (selections A, Y).
- h. Ferrule and Diaphragm Material must have the same material type selections.
- i. Optional selection Electropolish Certificate (selection E) only available with Diaphragm Material 316L Electropolished Stainless Steel (selection Y).
- j. DS-P Option -A only available with Pressure transmitter Model Codes that include Option -N3/3-A Sanitary Compliant (example: IGP10S-TP3D1CA-N3)
- k. Optional selections -1 and -2 are for buyautomation.com and internal use only.

NOTES

### ORDERING INSTRUCTIONS

1. Diaphragm seal model number
2. Transmitter model number (refer to transmitter PSS for model code)
4. Transmitter options/accessories not offered in the transmitter model code; see PSS 2A-1Z9 E, Transmitter Options and Accessories

### ADDITIONAL PRODUCTS

These product lines offer a broad range of measurement and instrument products, including solutions for pressure, flow, analytical, temperature, positioning, and controlling. For a list of these offerings, visit our web site at:

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