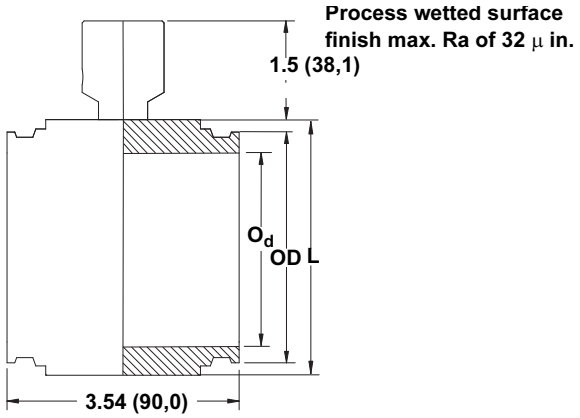
Sanitary Seals

TRI-CLAMP® IN-LINE (VCS) SEAL

Dimensional Drawing for VCS Sanitary In-Line Diaphragm Seal



Dimensions are in inches (millimeters)

DN	Max. Working Pressure	Dimensions (inches) 0d	0D	L
1 in.	600 psi	0.87	1.99	3.54
1½ in.	600 psi	1.37	1.99	3.54
2 in.	600 psi	1.87	2.52	3.54
3 in.	600 psi	2.87	3.58	3.54
4 in.	600 psi	3.83	4.69	3.54

TABLE 42. Tri-Clamp In-Line (VCS) Seal Ordering Information

Code	Industry Standard	
S	Sanitary (Conforms to 3-A Standard 74)	
Code	**Process Connection Style**	
VCS(1)	*Tri-Clamp* In-Line Seal Maximum Working Pressure: 600 psi (4140 kPa)	
Code	**Process Connection Size**	
20(2)	1 in.	
30(2)	1½ in.	
50	2 in.	
70	3 in.	
90	4 in.	
Code	**Diaphragm Material(3)**	**Housing Material**
LA00	316L SST	316L SST
Code	**Options**	
P	Non-Sanitary Fill Fluid (Does not conform to 3-A standard 74)	
H	20 μin. (0.5 μm) Ra diaphragm surface finish	
G(4)	15 μin. (0.375 μm) Ra diaphragm surface finish	
6	Electropolishing	

(1) Gasket and clamp are furnished by the user. The maximum working pressure is dependent upon the clamp pressure rating.

(2) Consult factory for low calibrated spans.

(3) When ordering optional diaphragm materials, the standard housing material is 316L SST. Optional housing, diaphragm and wetted parts materials are available upon request. Contact an emerson Process Management representative for additional information.

(4) Requires Option code 6, electropolishing.

Tri-Clamp (SCW) Seal

Sanitary *Tri-Clamp* Diaphragm Seal Dimensional Drawing

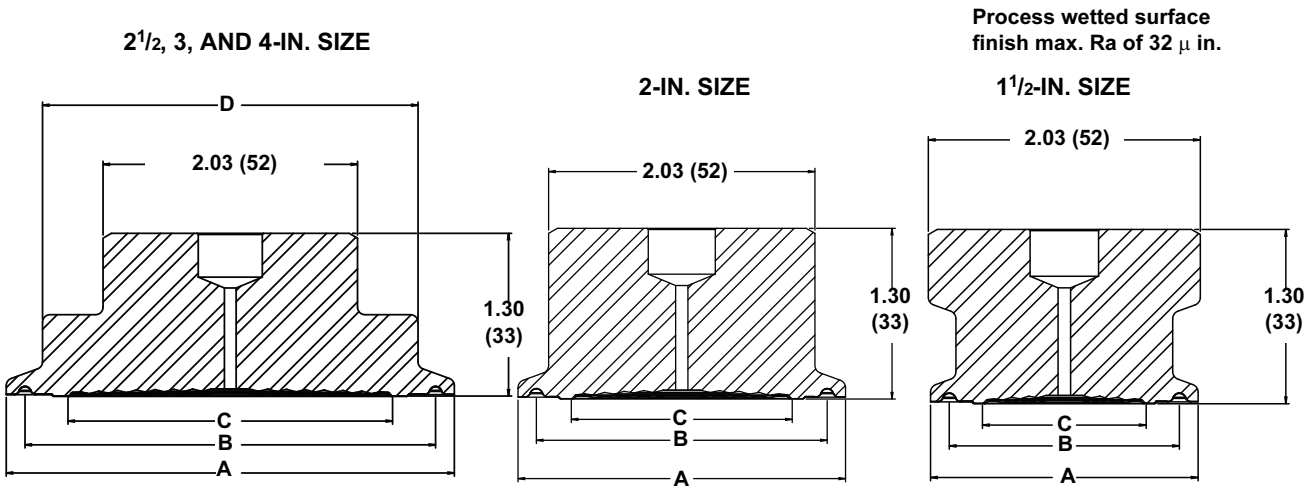
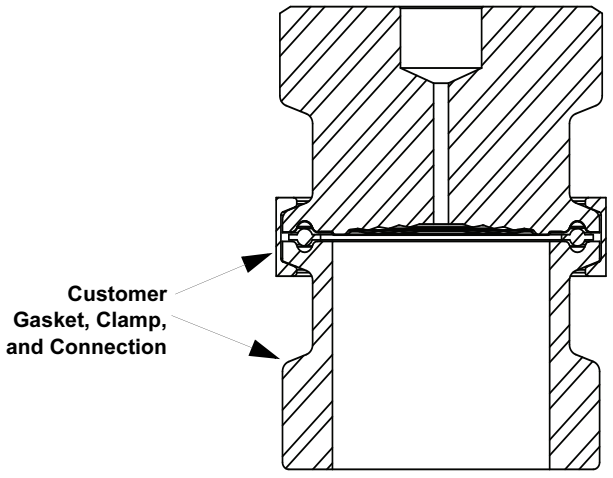


TABLE 43. Tri-Clamp SCW Dimensions[1]

Ordering Code	Size	Outer Diameter (A)	O-RIng Groove Diameter (B)	Diaphragm Diameter (C)	Diameter (D)
30	1.5 (38)	2.00 (50.8)	1.72 (43.7)	1.21 (30.8)	—
50	2.0 (51)	2.50 (63.5)	2.22 (56.4)	1.68 (42.6)	—
60	2.5 (64)	3.04 (77.4)	2.78 (70.6)	2.07 (52.6)	2.50 (64)
70	3.0 (76)	3.58 (90.9)	3.28 (83.3)	2.58 (62.6)	3.00 (76)
90	4.0 (102)	4.68 (119)	4.35 (110)	3.66 (93.0)	4.00 (102)

(1) Dimensions are in inches (millimeters).

Typical Installation



Rosemount 3051C with Direct Mount Seal (Connection Codes 93 and 94)

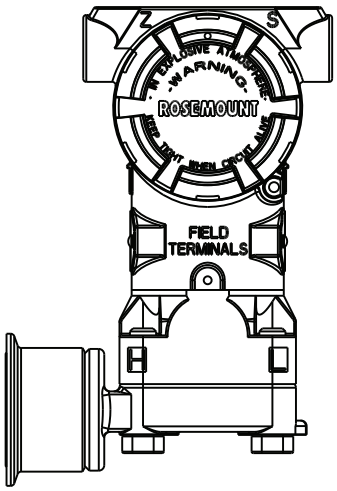


TABLE 44. Sanitary *Tri-Clamp* (SCW) Seal Ordering Information

Code	Industry Standard	
S	Sanitary (Conforms to 3-A Standard 74)	
Code	**Process Connection Style**	
SCW	Sanitary *Tri-Clover* Style *Tri-Clamp*(1)	
Code	**Process Connection Size**	
30(2)	1½ in.	
50(2)	2 in.	
60	2½ in.	
70	3 in.	
90	4 in.	
Code	**Diaphragm Material**	**Upper Housing Material**
LA	316L SST (WNr 1.4435)	316L SST
LB	Hastelloy C-276	316L SST
BB(3)	Hastelloy C-276	Hastelloy C-276
Code	**Lower Housing Flushing or Extension Option**	
00	Not Applicable	
Code	**Options**	
H	20 μin. (0.5 μm) R_a diaphragm surface finish	
G	15 μin. (0.375 μm) R_a diaphragm surface finish	
D	10 μin. (0.25 μm) R_a diaphragm surface finish	
2	High Pressure Ladish Clamp and Buna N Gasket–see Table 45 below for clamp pressure rating (Conforms to 3-A Standard 74)	
3	Buna-N Gasket (Conforms to 3-A Standard 74)	
6	Electropolishing	
P	Non-Sanitary Fill Fluid (Does not conform to 3-A Standard 74)	

(1) Clamp and gasket furnished by user. The maximum working pressure is dependent upon the clamp pressure rating.

(2) Consult an Emerson Process Management representative for use with low calibrated spans.

(3) Not available with option codes H, G, D, or 6.

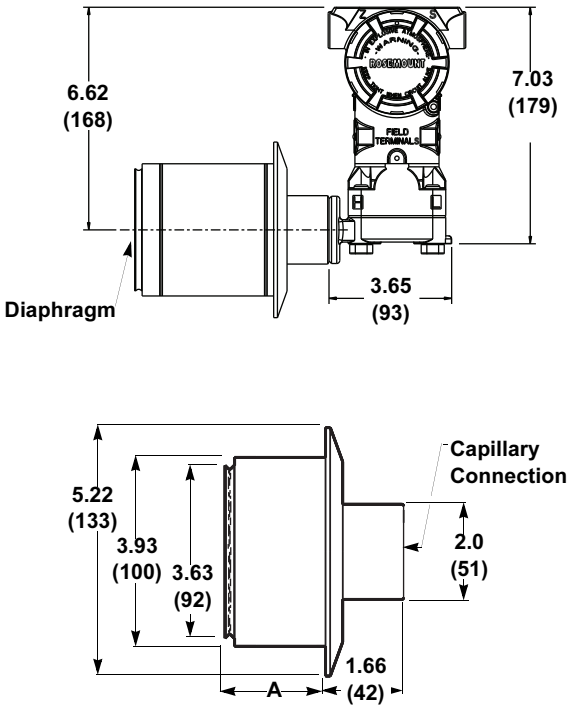
TABLE 45. High Pressure Ladish Clamp Maximum Working Pressure

Process Connection Size	psi at 70 °F	psi at 250 °F
1 1/2 in.	1,500	1,200
2 in.	1,000	800
2 1/2 in.	1,000	800
3 in.	1,000	800
4 in.	1,000	800

TANK SPUD (SSW) SEAL

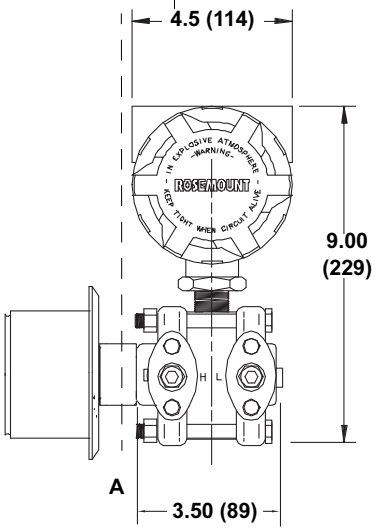
Sanitary Tank Spud Seal Dimensional Drawing

Direct Mount (Rosemount 3051C) (Connection Code 93 and 94)



Direct Mount (Rosemount 1151) (Connection Code 92)

Process wetted surface finish max. Ra of 32 μ in.



Extension Length	A
2 in. (51 mm)	2.11 in. (54 mm)
6 in. (152 mm)	6.11 in. (155 mm)

TABLE 46. Sanitary Tank Spud (SSW) Seal Ordering Information

Code	Industry Standard	
S	Sanitary (Conforms to 3-A Standard 74)	
Code	**Process Connection Style**	
SSW(1)	Sanitary Tank Spud Style	
Code	**Maximum Working Pressure (Clamp Rating)**	
A0	600 psig (4 136 kPa)	
Code	**Upper Housing Material**	
A	316 SST	
Code	**Wetted Parts Material – Diaphragm**	**Extension**
AL	316L SST (WNr 1.4435)(2)	316L SST(2)
BB	Hastelloy C-276	Hastelloy C-276/ 316L SST
Code	**Extension Length**	
2	2 in. Extension	
6	6 in. Extension	
Code	**Options**	
1	Tank Spud Included with Seal Shipment	
4	*Viton*® O-ring, instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74)	
3	Buna N O-ring, instead of Standard Ethylene Propylene O-ring (Conforms to 3-A Standard 74)	
P	Non-Sanitary Fill Fluid (Does not conform to 3-A Standard 74)	
C	150 μm (0.006-in.) Diaphragm Thickness	
H	20 μin.(0.5 μm) diaphragm surface finish	
G(3)	15 μin. (0.375 μm) diaphragm surface finish	
6	Electropolishing	

(1) Clamp and Ethylene Propylene o-ring (conforms to 3-A standard 74 and USP class VI) supplied.

(2) Diaphragm brazed and Tig-welded to extension.

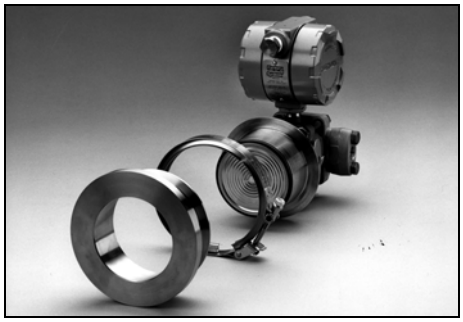
(3) Requires Option code 6, electropolishing.

Sanitary Tank Spud Accessories

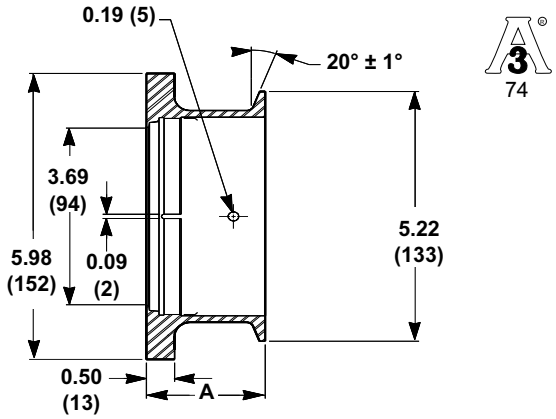
Tank Spud and Clamp



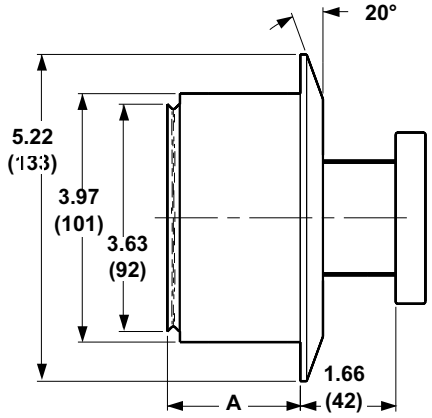
Rosemount 1151 with 1151 Direct Mount Sanitary Tank Spud with Tank Spud and Clamp



Tank Spud



Tank Spud Plug



Dimensions are in inches (millimeters)

TABLE 47. Sanitary Tank Spud Optional Accessories

Model	Description
1199-0061-	Sanitary Tank Spud(1)
Code	**Size**
0001	2 in.
0002	6 in.

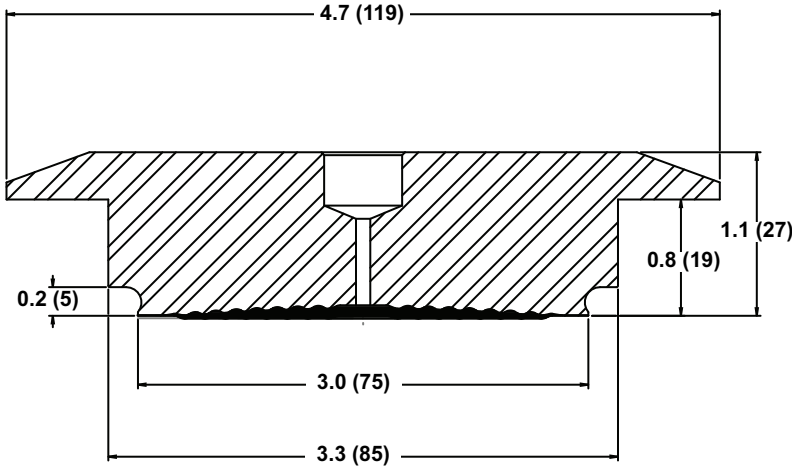
Model	Description
1199-0552-	Sanitary Tank Spud Plug
Code	**Size**
0001	2 in.
0002	6 in.

(1) Welding procedures and material certifications are shipped with the tank spud. Standard material is cast equivalent of 316L SST per ASTM- A351 grade CF3M.

TABLE 48. Sanitary Tank Spud Spare Parts

Part Number	Description
01199-0526-0002	Clamp
C531850070-0341	Ethylene Propylene O-ring

SANITARY THIN-WALL TANK SPUD (STW) SEAL





Dimensions are in inches (millimeters)

TABLE 49. Thin-Wall Tank Spud (STW) Seal Ordering Information

Code	Industry Standard
S	Sanitary (Conforms to 3-A Standard 74)
Code	**Process Connection Style**
STW(1)	Sanitary Thin Wall Tank Spud
Code	**Maximum Working Pressure (Flange Rating)**
B0	600 psig Maximum Working Pressure (41 bar) with supplied clamp and ethylene propylene O-ring
Code	**Upper Housing/Diaphragm Material**
LA	316 SST/316L SST
BB	Hastelloy C-276/Hastelloy C-276
Code	**Other Wetted Material/Extensions**
00	Not Applicable
Code	**Options**
P	Non-Sanitary Fill Fluid (Does not conform to 3-A Standard 74)
1	Tank Spud Included With Shipment
H	20 μin. (0.5 μm) R_a diaphragm surface finish
G(2)	15 μin. (0.375 μm) R_a diaphragm surface finish
6	Electropolishing

(1) For tank walls up to 3/16-in. thick. Clamp and Ethylene Propylene o-ring supplied.

(2) Requires option code 6, electropolishing.

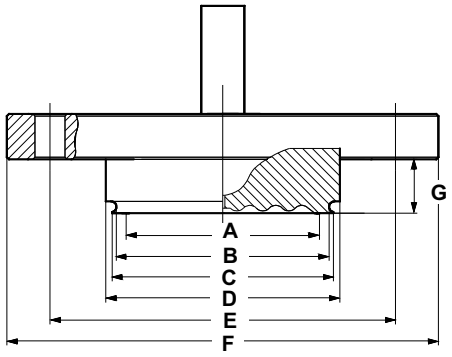
TABLE 50. Optional Accessories

Description	Part Number
Sanitary Thin-Wall Tank Spud	01199-0073-0001
Tri-Clamp	01199-0526-0004
Ethylene Propylene O-ring	53185-0070-0336

SANITARY FLANGED TANK SPUD EXTENDED (EES) SEAL

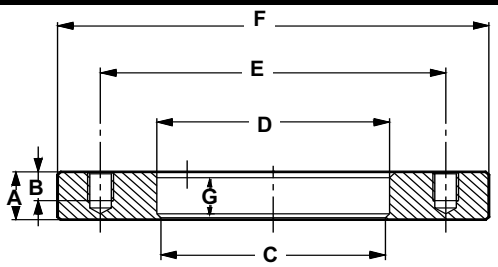
Dimensional Drawing for EES Sanitary Tank Spud Type: Extended Diaphragm Seal





		Dimensions (mm)						
DN	PN	A	B	C	D	E	F	G
50	40	72	73	76	82.5	125	165	25
80	40	89	98	102	108	160	200	25

Flanged Type Tank Spud



Flanged Type Tank Spud Dimensions

	Dimensions (mm)						
DN	A	B	C	D	E	F	G
50	25	15	76	82.5	125	165	22
80	25	15	103	108	160	200	22

TABLE 51. Sanitary Flanged Tank Spud Type (EES) Seal Ordering Information(1)

Code	Industry Standard	
S	Sanitary	
Code	**Process Connection Style**	
EES	Flanged Tank Spud Seal Type: Extended Diaphragm Seal (Supplied with ethylene propylene gasket)	
Code	**Process Connection Size**	**Flange Pressure Rating**
JG	DN 80	40 bar
GG	DN 50	40 bar
Code	**Diaphragm(2)**	
LA	316L SST	
LB	Hastelloy C-276	
Code	**Extension Length(3)**	
10	25 mm	
Code	**Options (Multiple Selections)**	
1	*Viton*® O-ring	
2	Tank spud counterpiece to be welded on tank: includes Ethylene-Propylene O-ring, stainless steel bolts, and washers	
B	Extra Fill for Cold Temperature Applications	
6	Electrolytical Polishing of Diaphragm Material	
7	Blind Plug for Tank Spud Counterpiece	

(1) Shaded areas indicate special orders. Consult an Emerson Process Management representative for availability, performance effects, and lead time.

(2) When ordering optional diaphragm materials, the standard housing material is 316L SST unless noted otherwise.

(3) Other extension lengths are available upon request.

VARIVENT COMPATIBLE CONNECTION (SVS) SEAL

Dimensional Drawing for *Varivent* Compatible Connection



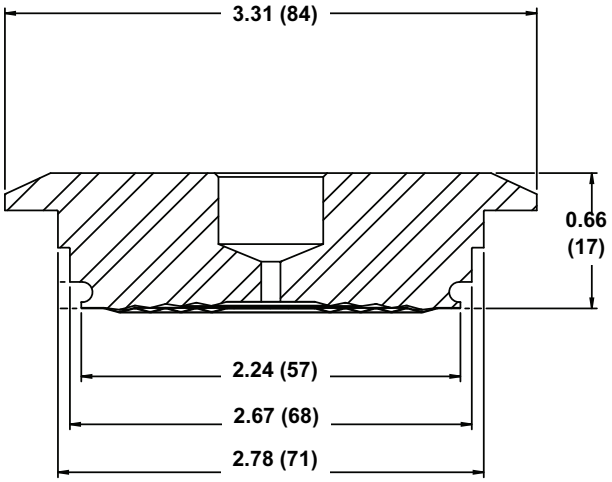


TABLE 52. *Varivent* Compatible Sanitary (SVS) Seal Ordering Information

Code	Industry Standard
S	Sanitary
Code	**Process Connection Style**
SVS	Off-line *Varivent* compatible (maximum working pressure: 40 bar)
Code	**Process Connection Size**
V0	*Varivent* compatible standard connection only
Code	**Diaphragm Material**
LA00	316L SST
Code	**Options (Multiple Selections)**
6	Electrolytical polishing of diaphragm material
B	Extra Fill for Cold Temperature Applications

CHS HOMOGENIZER CLAMPING FLANGE TYPE (CHS) SEAL

Dimensional Drawings for CHS Homogenizer Clamping Flange Type



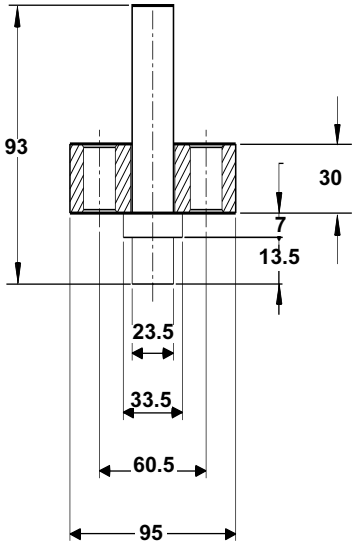


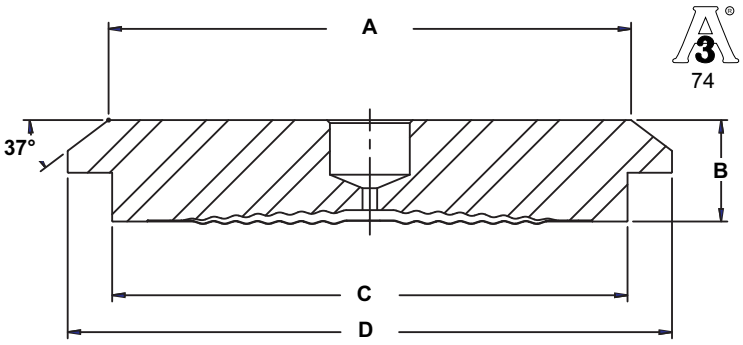
TABLE 53. Homogenizer Clamping Flange Type (CHS) Seal Ordering Information(1)

Code	Process Connection Style
NCHS	Homogenizer Clamping Flange
Code	**Process Connection Size**
C	23,5 mm
Code(2)	**Pressure Rating**
R	600 bar
Code	**Diaphragm and Wetted Parts Material**
LA00	316L SST
Code	**Options (Multiple Selections)**
V	*PTFE* Coated Diaphragm for nonstick purposes only (available with 316L SST and Hastelloy C–276 diaphragm only)
B	Extra Fill for Cold Temperature Applications

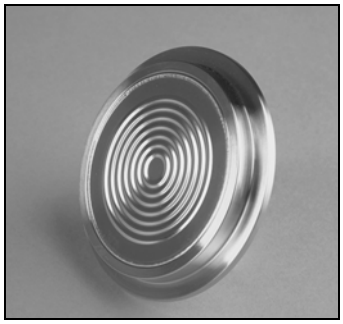
(1) Shaded areas indicate special orders. Please consult an Emerson Process Management representative for availability, performance effects, and lead time.

(2) Minimum span is 60 bar.

Cherry-Burrell "I" LINE (SHP) SEAL



Process wetted surface finish max. Ra of 32 μ in



Diameter (Nominal)	Dimensions (in inches (millimeters))			
	"A"	"B"	"C"	"D"
2 in.	2.04 (52)	0.65 (17)	2.24 (57)	2.64 (67)
3 in.	3.35 (85)	0.65 (17)	3.30 (84)	3.87 (98)

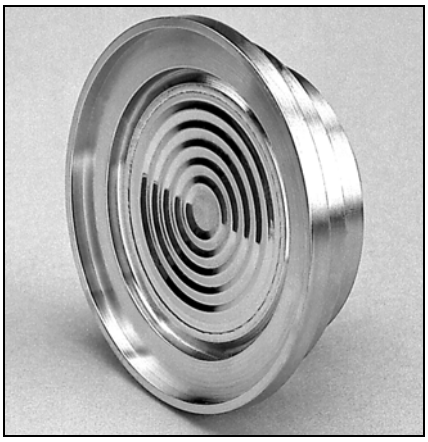
TABLE 54. *Cherry-Burrell* "I" Line (SHP) Seals Ordering Information

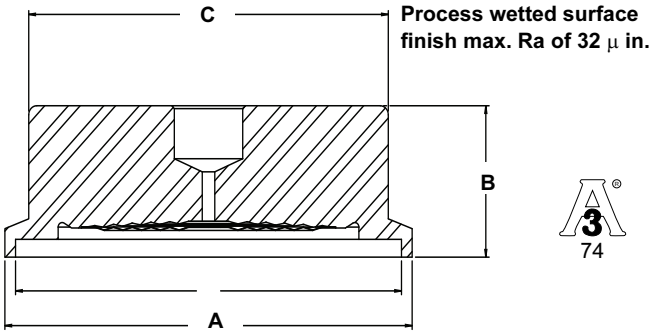
Code	Industry Standard
S	Sanitary (Conforms to 3-A Standard 74)
Code	**Process Connection Style**
SHP(1)	Sanitary *Cherry-Burrell* "I" Line Style (Maximum Working Pressure 500 psig)
Code	**Process Connection Size**
50(2)	2 in.
70	3 in.
Code	**Upper Housing/Diaphragm Material**
AA	316 SST/316L SST
BB	Hastelloy C-276/Hastelloy C-276
Code	**Lower Housing/Flushing Option**
00	Not Applicable
Code	**Options**
P	Non-Sanitary Fill Fluid (Does not conform to 3-A Standard 74)

(1) Clamp and gasket furnished by user. Maximum working pressure is the lesser of either clamp pressure rating or 500 psi.

(2) Contact an Emerson Process Management representative for use with low calibrated spans.

ASEPTIC STYLE (APC) SEAL





Diameter (Nominal)	"A"	"B"	"C"	"D"
2 in.	3.05 (77)	1.0 (25)	2.69 (68)	2.89 (73)
3 in.	4.23 (107)	1.0 (25)	3.80 (97)	4.01 (102)

Dimensions are in inches (millimeters)

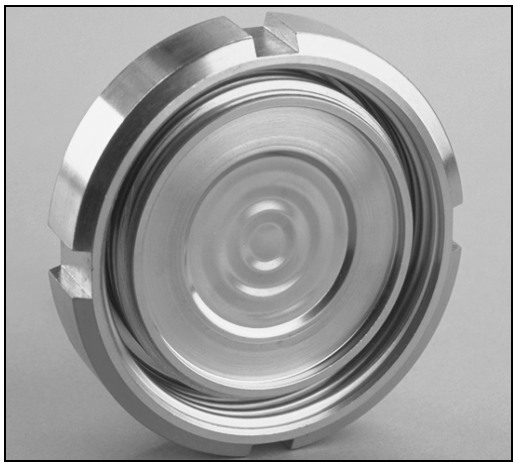
TABLE 55. Aseptic Style APC (SAP) Seal Ordering Information

Code	Industry Standard
S	Sanitary (Conforms to 3-A Standard 74)
Code	**Process Connection Style**
SAP	APC Style Seal[1]
Code	**Process Connection Size**
50[2]	2 in.
70	3 in.
Code	**Upper Housing/Diaphragm Material**
LA	316L SST / 316L SST
Code	**Lower Housing/Flushing Option**
00	Not Applicable
Code	**Seal Options**
P	Non-Sanitary Fill Fluid (Does not conform to 3-A Standard 74)

(1) Clamp and gasket furnished by user.

(2) Consult an Emerson Process Management representative for use with low calibrated spans.

DAIRY PROCESS CONNECTIONS— *FEMALE THREAD* (DIN 11851 AND SMS) SEALS



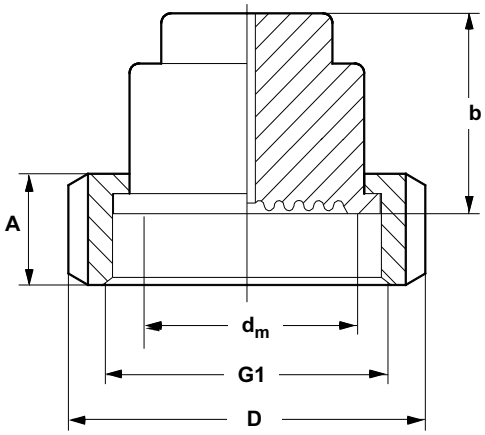


TABLE 56. Dairy Process Connection - **Female Thread** Dimensions

Standard	DN	PN	DIMENSIONS (mm)				
			A	b	d_m	G1	D
DIN 11851	40	40	21	45	40	Rd65×1/6	78
	50	40	22	46	57	Rd78×1/6	92
	65	40	25	47	59	Rd95×1/6	112
	80	40	29	47	76	Rd110×1/4	127
SMS	38	40	25	40	32	Rd60×1/6	74
	51	40	26	40	50	Rd70×1/6	84
	63.5	40	30	40	50	Rd85×1/6	100
	76	40	32	40	76	Rd98×1/6	114
IDF(1)							
RTJ(1)							

(1) Contact factory for dimensions.

TABLE 57. Sanitary (SLS) Seals: Dairy Process Connection - **Female Thread** Ordering Information

Code	Industry Standard	
S	Sanitary	
Code	**Process Connection Style**	
SLS(1)(2)	Female Thread per DIN 11851	
Code	**Process Connection Size**	**Maximum Working Pressure (Flange Rating)**
F0	DN 40	40 bar
G0	DN 50	25 bar
J0	DN 80	25 bar
H0	DN 65	25 bar
Code	**Diaphragm Material**	**Upper Housing Material**
LA00	316L SST	316L SST (coupling nut 304L SST)
Code	**Options (Multiple Selections)**	
6	Electrolytical polishing of diaphragm material	
2	Counterpiece (tank/pipe spud) and Gasket	

(1) Shaded areas indicate special orders. Consult an Emerson Process Management representative for configuration availability, performance effects, and lead time.

(2) Available with welded capillary or direct mount connections only.

TABLE 58. Sanitary (SMS) Seals: Dairy Process Connection - **Female Thread** Ordering Information

Code	Industry Standard	
S	Sanitary	
Code	**Process Connection Style**	
SMS(1)(2)	Female Thread per SMS Standard	
Code	**Process Connection Size**	**Maximum Working Pressure (Flange Rating)**
30	DN 38 ($1^1/_2$ in.)	40 bar
50	DN 51 (2 in.)	25 bar
60(3)	DN 63.5	25 bar
70	DN 76	25 bar
Code	**Diaphragm Material**	**Housing Material**
LA00	316L SST	316L SST (coupling nut 304L SST)
LB00(4)	Hastelloy C-276	316L SST
Code	**Options (Multiple Selections)**	
6	Electrolytical polishing of diaphragm material	
2	Counterpiece (tank/pipe spud) and Gasket	

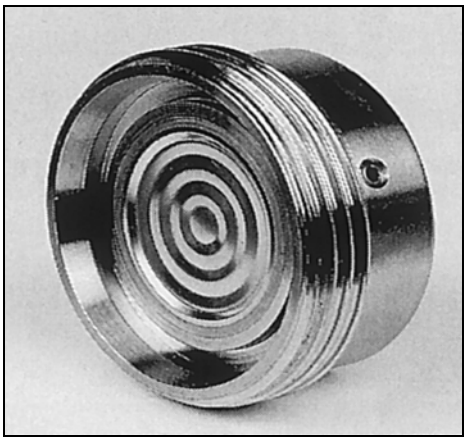
(1) Shaded areas indicate special orders. Consult an Emerson Process Management representative for configuration availability, performance effects, and lead time.

(2) Available with welded capillary or direct mount connections only.

(3) Process Connection Size Code 6 is not available with the SMS seal.

(4) Diaphragm/Housing Material code LB00 is available only with the SRS Seal.

DAIRY PROCESS CONNECTIONS—*MALE THREAD*



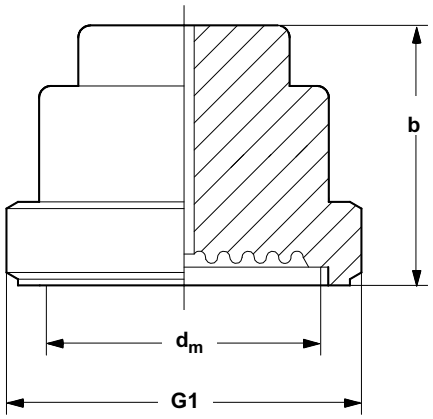


TABLE 59. Dairy Process Connections Male Thread Dimensions

			DIMENSIONS (mm)		
Standard	**DN**	**PN**	**b**	**d_m**	**G1**
DIN 11851	40	40	46	40	Rd65×1/6
	50	40	46	50	Rd78×1/6
	65	40	46	57	Rd95×1/6
	80	40	47	76	Rd110×1/4
SMS	38	40	47	40	Rd60×1/6
	51	40	47	50	Rd70×1/6
	63.5	40	47	57	Rd85×1/6
	76	40	47	76	Rd98×1/6
IDF[1]					
RTJ[1]					

(1) Consult the factory for dimensions.

TABLE 60. Sanitary (MLS) Seal: Dairy Process Connections - Male Thread Ordering Information

Code	Industry Standard	
S	Sanitary	
Code	**Process Connection Style**	
MLS(1)(2)	Male Thread per DIN 11851	
Code	**Process Connection Size**	**Maximum Working Pressure (Flange Rating)**
F0	DN 40	40 bar
G0	DN 50	25 bar
J0	DN 80	25 bar
H0	DN 65	25 bar
Code	**Diaphragm Material**	**Upper Housing**
LA00	316L SST	316L SST (coupling nut 304L SST)
Code	**Options (Multiple Selections)**	
6	Electrolytical polishing of diaphragm material	
2	Counterpiece (tank/pipe spud) and gasket	

(1) Shaded areas indicate special orders. Consult an Emerson Process Management representative for configuration availability, performance effects, and lead time.

(2) Available with welded capillary or direct connections only.

TABLE 61. Sanitary (MMS) Seal: Dairy Process Connections - Male Thread Ordering Information

Code	Industry Standard	
S	Sanitary	
Code	**Process Connection Style**	
MMS(1)(2)	Male Thread per SMS Standard	
Code	**Process Connection Size**	**Maximum Working Pressure (Flange Rating)**
30	DN 38 ($1^1/_2$ in.)	40 bar
50	DN 51 (2 in.)	25 bar
60	DN 63	25 bar
70	DN 76	25 bar
Code	**Diaphragm Material and Wetted Parts**	**Upper Housing**
LA00	316L SST	316L SST (coupling nut 304L SST)
LB00(3)	Hastelloy C-276	316L SST
Code	**Options (Multiple Selection)**	
6	Electrolytical polishing of diaphragm material	
2	Counterpiece (tank/pipe spud) and gasket	

(1) Shaded areas indicate special orders. Consult an Emerson Process Management representative for configuration availability, performance effects, and lead time.

(2) Available with welded capillary or direct mount connections only.

(3) Diaphragm/Housing Material code LB00 is available with the MRS seal only.