

S6 Series Remote Seals with 600T Series Smart Pressure Transmitters

From the Leader in Remote Seal Transmitters



- **Wide range of remote seal types**
 - allow optimum design for each application without compromise of performance
- **Large selection of options, materials and fill fluids**
 - meet nearly all process requirements
- **All welded construction**
 - for long life, reliability, performance, and tamper proof
- **Specially designed remote seals for individual process solutions**
 - add flexibility for most demanding services

S6 Series Remote Seals are based on decades of technology experience providing high performance in real operating conditions

The following remote seal specifications complete the 600T EN Series pressure transmitter model 621ES, and 624ES specifications by providing information on the seal systems and their relevant effects on the transmitter's performance and operational limits.

ABB Instrumentation

The ABB logo, consisting of the letters 'A', 'B', and 'B' in a bold, sans-serif font. The 'A' is slightly larger than the 'B's. The letters are dark grey or black.

REMOTE SEALS OVERVIEW

The S6 Series Seal System is a protective device used to isolate 600T series transmitters from the process fluid.

The seal system provides a flexible diaphragm seal between the process fluid and a liquid filled capillary tube connected to the body of the transmitter. The diaphragm isolates the process fluid while the filled capillary tube hydraulically transmits the process pressure to the transmitter. The capillary is corrosion-resistant with robust construction in stainless steel with spiral armour protection and polyethylene jacket.

When used without a seal, these transmitters are generally connected to process piping or a process vessel by impulse lines. The process, fills the impulse lines, and enters the body of the transmitter. For certain applications, it is necessary to prevent the process fluid from leaving its enclosure.

Some reasons why a remote seal is required :

- The process fluid is highly corrosive. Remote seals offer a much wider choice of corrosion resistant materials than are available in conventional transmitters.
- The process fluid has solids in suspension or is highly viscous and can foul impulse lines.
- The process fluid can solidify in impulse lines or the transmitter.
- The process fluid is too hazardous to enter the control area where the transmitter is located.
- The process temperature exceeds the recommended limits for the transmitter.
- The application is interface level or density measurement. Remote seals offer the required constant and equal specific gravity of the pressure transfer fluid on the high and low sides of the transmitter.
- The transmitter must be located away from the process for easier maintenance.

The S6 series is available with process connections for ANSI pipe flanges, wedge flow elements, chemical tees, and threaded pipe fittings. Extended diaphragm remote seals, suitable for connection to 3in or 4in flanged tank nozzles or flanged tees, permit the seal diaphragm to be located flush with the inside of a tank or pipe. Sanitary and sanitary aseptic type seals meet the stringent requirements of sanitary food, dairy, pharmaceutical and Bio Tech applications. All sanitary seals comply with 3A Sanitary Standard No. 37-01.

The all welded construction assures reliable operation over a wide range of operating temperature and under vacuum conditions.

The S6 Series Seal Systems are available with a variety of remote seal models identified as follows :

- S6A Sanitary Aseptic Remote Seal
- S6C Chemical Tee Remote Seal
- S6E Extended Diaphragm Remote Seal
- S6F Flush Diaphragm Remote Seal
- S6R Off-Line Flanged Connection Remote Seal
- S6S Sanitary Remote Seal
- S6T Off-Line Threaded Connection Remote Seal
- S6U Threaded Union Remote Seal
- S6W Wafer Remote Seal

REMOTE SEAL SYSTEM SELECTION CRITERIA

The attachment of remote seals to the pressure transmitter does affect the measuring performance of the system. Those effects are related to the physical laws of fluids.

It is important to know the main factors which are affecting the transmitter basic performance:

- seal diaphragm flexibility for accuracy
- total volume of fill fluid for process temperature effect
- fill fluid characteristics, inside diameter of capillary and its length for ambient temperature effect and response time.

To obtain the best performance:

- choose sensor code with URL closest to application SPAN (see LRL/URL table of 600T Series Pressure Transmitters with S6 Series Remote Seal product data sheet).
- select largest diameter diaphragm seal related to URL.
- keep the capillary length as short as possible
- select the fill fluid that suits the most extreme process conditions expected (highest temperature and lowest pressure) and insure that it is compatible with the process fluid.
- In vacuum application, always choose the all welded version and mount the transmitter primary 30 cm/12 inches or more below the bottom seal connection.
- In a two-seal system use the same diaphragm size, capillary length and fill fluid on each side of the transmitter.

TABLE A - FILL FLUIDS

FILL FLUIDS	OPERATING CONDITIONS						SPECIFICATIONS			
	Pressure and Temperature Process Limits				Temperature Ambient Limits		Specific gravity @ 25°C (77°F)	Viscosity cSt @ 25°C (77°F)	Time Constant Ratio	Thermal Expansion °C (°F) •10 ⁻³
	Pmin (psia)	Tmin °C (°F)	Tmax at P >14 psia °C (°F)	Tmax at P min °C (°F)	Tmin °C (°F)	Tmax °C (°F)				
DC 200 Silicone oil	0	-40 (-40)	204 (400)	149 (300)	-40 (-40)	85 (185)	0.913	5	1	1.05 (0.58)
DC 702 Silicone oil	0	-7 (20)	316 (600)	177 (350)	-7 (20)	85 (185)	1.07	45	10.55	0.78 (0.43)
DC 704 Silicone oil	0	21 (70)	340 (645)	232 (450)	21 (70)	85 (185)	1.07	39	9.14	0.95 (0.53)
*Glycerin Water (70%) (FDA)	14.7	-7 (20)	93 (200)	93 (200)	-7 (20)	85 (185)	1.07	2.1	0.49	0.36 (0.20)
Inert fluid (Galden) (Oxygen Service)	0.1	-18 (0)	160 (320)	66 (150)	-18 (0)	85 (185)	1.8	10	3.94	1.1 (0.61)
Ethyl Alcohol	14.7	-100 (-157)	70 (158)	70 (158)	-40 (-40)	70 (158)	0.79	1.5	0.26	1.1 (0.61)
*Propylene Glycol-water (70%) (FDA)	14.7	-15 (5)	90 (194)	90 (194)	-15 (5)	85 (185)	1.02	3.2	0.72	1.2 (0.65)
*Neobee M-20 (FDA)	2	-18 (0)	204 (400)	149 (300)	-18 (0)	85 (185)	0.92	9	1.81	0.88 (0.49)
KTFILL-1 (Paints and specials)	0.1	-10 (14)	300 (570)	160 (200)	-10 (14)	85 (185)	1.04	15	3.4	0.92 (0.52)

FUNCTIONAL SPECIFICATIONS

Data are given at reference operating conditions, zero based span. Silicone oil (DC 200) fill fluid or other with thermal expansion ~1•10⁻³, AISI 316 L ss diaphragm seal (both seals at the same average temperature).

Minimum span (recommended): *is function of capillary length and remote seal type.*

Refer to the respective remote seal data sheet for detailed functional specification (see table B).

Maximum capillary length *is function of the operating conditions.*

Refer to the respective remote seal data sheet for detailed functional specification (see table B).

Capillary

304 sst with 304 sst spiral armor and pvc jacket.

Zero elevation/suppression

In the liquid level application, due to the wet leg effect of the fill fluid in the capillary an elevated/suppressed zero range is required and must be within the following:

- maximum zero suppression + calibrated span ≤ URL
- maximum zero elevation ≤ LRL.

*** FOOD GRADE FILLS (GRAS)**

Fill fluids identified with FDA are defined as food grade fills and are Generally Recognized As Safe (GRAS) by the US Food and Drug Administration (FDA).

PERFORMANCE SPECIFICATION

Accuracy *is a function of the seal diaphragm flexibility and Upper Range Limit (URL): a larger diameter (flexibility) gives better accuracy*

- **Accuracy rating** : as per transmitter values but also refer to the respective remote seal data sheet (see table B).

Time Response *is influenced by fill fluid viscosity and transmitter URL; the better time response is obtained by lowest capillary length and viscosity and highest URL.*

• **Time constant** :

Second per meter of capillary at 25°C with DC200 fill fluid (see table B).

Static pressure effect per 7 MPa, 70 bar, 1015 psi (DP only)

- zero error of transmitter and seal system is 1.1 times the base transmitter static pressure error; span is not affected.

Temperature effect *changes of fill fluid volume cause zero errors ; span is not affected.*

The temperature zero errors in mbar, after the transmitter electronic compensation are :

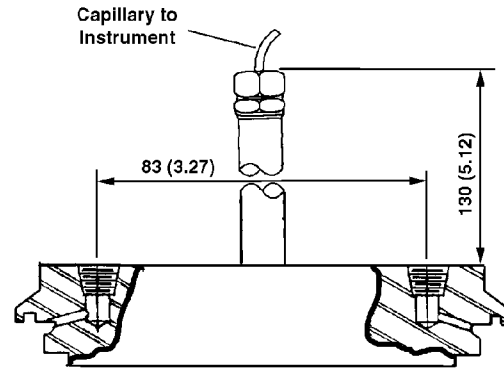
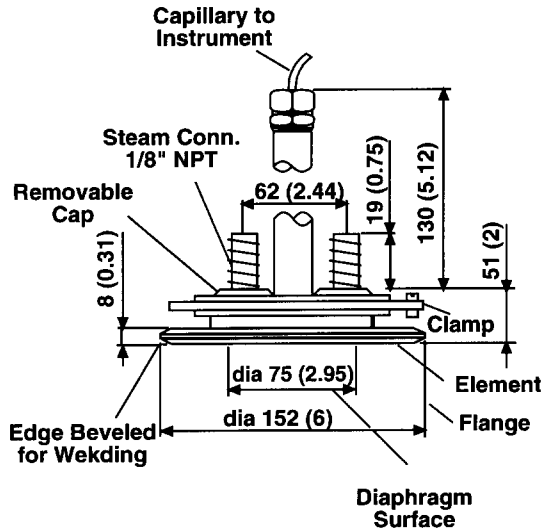
- per 50°F ambient temperature change (ETxc) for transmitter and capillary
- per 50°F process temperature change (E s) for seal(s)

Refer to the respective remote seal data sheet for detailed performance specification (see table B).

S6A Model Sanitary Aseptic Seal(s)

The sanitary aseptic remote seal is designed to connect to a 4 in. sanitary fitting: either an aseptic tank spud or a 4 in. Cherry Burrell aseptic ferrule. The tank spud and O-rings are available with the seal element.

NOTE : The tank spud or ferrule required for connection of this seal must be welded to the process vessel prior to connecting the element. Refer to Installing Sanitary Tank Spuds for the spud mounting dimensions and a recommended welding and pressure testing procedure. Weld the Cherry Burrell ferrule to the process vessel in accordance with the manufacturers recommendations.



SANITARY ASEPTIC SEAL WITH FLUSH DIAPHRAGM

4in CHERRY BURRELL FOR ASEPTIC

Maximum Working Pressure

- 4 in. tank spud connection: 1.9 MPa, 19 bar, 275 psi
- 4 in. tank spud connection with optional V-Band clamp: 1 MPa, 10 bar, 150 psi @ 21°C (70°F)
- Cherry Burrell Aseptic ferrule connection: 1 MPa, 10 bar, 150 psi

Vacuum Service

full vacuum subject to fill fluid limits. Refer to **Fill Fluids Table A**.

Span Limits

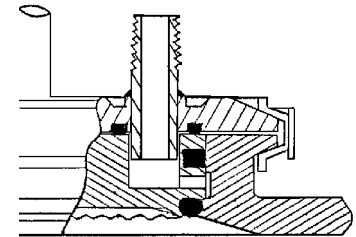
Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**.

Process O-Ring Temperature Limits

- Buna : -40 to 121°C (-40 to 250°F)
- Viton : 2 to 177°C (35 to 350°F)



Aseptic Seal Detail

TABLE 'B'

4 in. Flush Aseptic & 4 in. Cherry-Burrell Aseptic Sanitary, -S6A		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	35ft
S6A	one seal	160 in.H2O	0.02 sec.	35ft	30 in. H2O	40 in. H2O	65 in. H2O	95 in. H2O
S6A	two seals	160 in.H2O	0.04 sec.	35ft	20 in. H2O	20 in. H2O	30 in. H2O	50 in. H2O

4 in. Flush Aseptic & 4 in. Cherry-Burrell Aseptic Sanitary, -S6A		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	35ft	
S6A	one seal	0.4 in. H2O	0.75 in. H2O	1.35 in. H2O	2.15 in. H2O	0.8 in. H2O
S6A	two seals	0.1 in. H2O	0.2 in. H2O	0.35 in. H2O	0.5 in. H2O	0.1 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).
With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note: Contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

S6A MODEL SANITARY/ASEPTIC SEAL

Select one character or set of characters from each category and specify complete catalog number.

Code No. Description

S6A **BASE NUMBER** - 1st and 2nd characters
Sanitary/Aseptic (steam seal) Remote Seal

NUMBER OF REMOTE SEALS - 4th character
1 One Remote Seal
2 Two Remote Seals (621E only; order 1 per transmitter)

S4		4 in. tank spud connection
	S6	4 in. Cherry Burrell for aseptic ferule (requires 13th character = 0)

MOUNTING CONNECTION - 5th and 6th characters

OTHER WETTED MATERIAL - 7th character
0 Same as diaphragm

SEAL DIAPHRAGM MATERIAL - 8th character
2 AISI 316 L ss

EXTENSION LENGTH - 9th character
0 None

CAPILLARY FILL FLUID - 10th character
A Silicone oil (DC 200)
G Glycerin/Water (GRAS by FDA)
K Propylene Glycol/Water (GRAS by FDA)
N Neobee M-20 (GRAS by FDA)

SYSTEM LENGTH feet (m)- 11th and 12th characters
03 to 35 Specify in one foot increments from **3** ft (1 m) to **35** ft (10 m). Use English equivalent of any metric length.

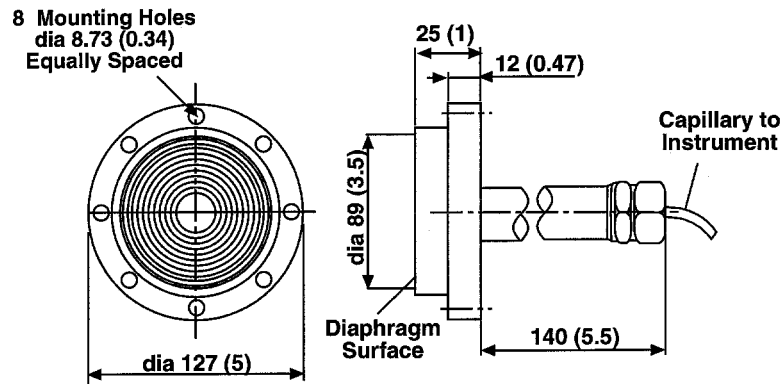
0	0	None
1		Buna (suitable with 6th character = 4)
2		Viton (suitable with 6th character = 4)

00	00	None
W7		4 in. V-band clamp (6th character = 4)
J3		Aseptic Tank spud (6th character = 4)
J4		Aseptic end cap (6th character = 4) (REQUIRED FOR NEW INSTALLATIONS)

Viton is a Dupont de Nemour trademark

S6C Model Chemical Tee Seal(s)

The chemical tee seal is designed to connect to a Wedge Flow Element or to any process fitting with appropriate mating connection. Chemical tee elements cannot be connected to a standard ANSI pipe flange.



CHEMICAL TEE SEAL

Maximum Working Pressure

2 MPa, 20 bar, 300 psi

Vacuum Service

Full vacuum subject to fill fluid limits. Refer to **Fill Fluids Table A**.

Span Limits

Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**.

Process Gasket Temperature Limits

PTFE gasket : 204°C (400°F) maximum

Graphite gasket : 340°C (645°F) maximum, sealability per ASTM F37A (1/32) 0.50 ml/hr

TABLE 'B'

Chemical Tee SEAL - S6C -		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	35ft
F6	one seal	40 in. H ₂ O	0.09 sec.	35ft	20 in. H ₂ O	20 in. H ₂ O	25 in. H ₂ O	35 in. H ₂ O
F6	two seals	40 in. H ₂ O	0.18 sec.	35ft	10 in. H ₂ O	10 in. H ₂ O	12 in. H ₂ O	20 in. H ₂ O

Chemical Tee SEAL - S6C -		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	35ft	
F6	one seal	0.15 in. H ₂ O	0.3 in. H ₂ O	0.5 in. H ₂ O	0.75 in. H ₂ O	0.4 in. H ₂ O
F6	two seals	0.05 in. H ₂ O	0.05 in. H ₂ O	0.1 in. H ₂ O	0.2 in. H ₂ O	0.05 in. H ₂ O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).
With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- (2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- (3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note

Please contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

S6C MODEL CHEMICAL TEE SEAL

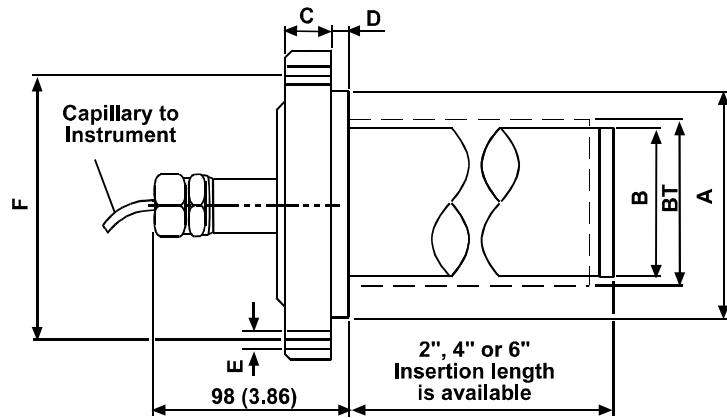
Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description
S6C	BASE NUMBER - 1st to 3rd characters Chemical Tee Remote Seal
	NUMBER OF REMOTE SEALS - 4th character
1	One Remote Seal
2	Two Remote Seals (621E only; order 1 per transmitter)
	MOUNTING CONNECTION - 5th and 6th characters
F6	Same as diaphragm
	OTHER WETTED MATERIAL (Not diaphragm) - 7th character
0	Same as diaphragm
	DIAPHRAGM MATERIAL - 8th character
2	AISI 316 L ss (NACE)
3	Hastelloy C276
7	AISI 316 L ss with Teflon anti-stick coating (maximum temperature 400°F, 204°C)
8	Hastelloy C276 with Teflon anti-stick coating (maximum temperature 400°F, 204°C)
	EXTENSION LENGTH - 9th character
0	None
	CAPILLARY FILL FLUID - 10th character
A	Silicone oil (DC 200)
C	Silicone oil (DC 702)
D	Silicone oil (DC 704)
G	Glycerin/Water
P	Inert Fluid
J	Ethyl Alcohol
K	Propylene Glycol/Water
L	KTFILL-1
N	Neobee M-20
	SYSTEM LENGTH feet (m)- 11th and 12th characters
03 to 35	Specify in one foot increments from 3 ft (1 m) to 35 ft (10 m). Use English equivalent of any metric length.
	PROCESS GASKET MATERIAL - 13th character
0	None
4	PTFE with Silica Filler (Maximum temperature 400°F)
6	Graphite (Maximum temperature 645°F)
	OPTIONS - 14th and 15th characters
00	None

Hastelloy is a Cabot Corporation trademark

S6E Model Flanged Extended Diaphragm Seal(s)

The extended diaphragm remote seals are designed to connect to ANSI flanged pipe fitting. For liquid level measurement installations the seal connects to an ANSI flanged tank nozzle (Schedule 40 only).



EXTENDED DIAPHRAGM SEAL

Maximum Working Pressure
Same as rating for ANSI flange.

Vacuum Service
Full vacuum subject to fill fluid limits.
Refer to **Fill Fluids Table A**.

Span Limits
Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits
Same as fill fluid limits.
Refer to **Fill Fluids Table A**.

SIZE/RATING	DIMENSIONS mm (in)							No. OF HOLES
	A	B	BT	C	D	E	F	
3in ANSI CL 150	127 (5)	75 (2.96)		24 (0.94)	9.5 (0.37)	19 (0.75)	152.5 (6)	4
3in ANSI CL 300	127 (5)	75 (2.96)		28.5 (1.12)	9.5 (0.37)	22 (0.86)	168.5 (6.63)	8
4in ANSI CL 150	157.2 (6.2)	75 (2.96)	95 (3.75)	24 (0.94)	9.5 (0.37)	19 (0.75)	190.5 (7.5)	8
4in ANSI CL 300	157.2 (6.2)	75 (2.96)	95 (3.75)	32 (1.26)	9.5 (0.37)	22 (0.86)	200.2 (7.88)	8

TABLE 'B'

Extended Diaphragm SEAL - S6E -		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	35ft
3 in.	1 seal	160 in.H2O	0.02 sec.	35ft	30 in. H2O	40 in. H2O	65 in. H2O	95 in. H2O
3 in.	2 seals	160 in.H2O	0.04 sec.	35ft	20 in. H2O	20 in. H2O	30 in. H2O	50 in. H2O
4 in.	1 seal	160 in.H2O	0.02 sec.	35ft	30 in. H2O	40 in. H2O	65 in. H2O	95 in. H2O
4 in.	2 seals	160 in.H2O	0.04 sec.	35ft	20 in. H2O	20 in. H2O	30 in. H2O	50 in. H2O

Extended Diaphragm SEAL- S6E -		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	35ft	
3 in.	1 seal	0.4 in. H2O	0.75 in. H2O	1.35 in. H2O	2.15 in. H2O	0.8 in. H2O
3 in.	2 seals	0.1 in. H2O	0.2 in. H2O	0.35 in. H2O	0.5 in. H2O	0.1 in. H2O
4 in.	1 seal	0.4 in. H2O	0.75 in. H2O	1.35 in. H2O	2.15 in. H2O	0.8 in. H2O
4 in.	2 seals	0.1 in. H2O	0.2 in. H2O	0.35 in. H2O	0.5 in. H2O	0.1 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).
With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- (2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- (3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note : For data and characteristics different from those stated in table "B" please contact ABB Instrumentation.

ORDERING INFORMATION

S6E MODEL FLANGED EXTENDED DIAPHRAGM SEAL(S)

Select one character or set of characters from each category and specify complete catalog number.

Code No. Description

S6E **BASE NUMBER** - 1st to 3rd characters
Flanged Extended Diaphragm Remote Seal

NUMBER OF REMOTE SEALS - 4th character

0 For direct mount (requires system length code 00 at character "11th and 12th")
1 One Remote Seal
2 Two Remote Seals (621E only; order 1 per transmitter)

MOUNTING CONNECTION BACKUP FLANGE - 5th and 6th characters

Size	Rating	Material
K3	3 in. ANSI CL 150	Carbon steel
S3	3 in. ANSI CL 150	AISI 316 ss
L3	3 in. ANSI CL 300	Carbon steel
36	3 in. ANSI CL 300	AISI 316 ss
K4	4 in. ANSI CL 150	Carbon steel
3B	4 in. ANSI CL 150	AISI 316 ss
L4	4 in. ANSI CL 300	Carbon steel
3C	4 in. ANSI CL 300	AISI 316 ss

OTHER WETTED MATERIAL (Not diaphragm) - 7th character
2 AISI 316 L ss (NACE)
3 Hastelloy C276 (diaphragm material = 3 and 8 only)

DIAPHRAGM MATERIAL - 8th character
2 AISI 316 ss (NACE)
3 Hastelloy C276
7 AISI 316 L ss with Teflon anti-stick coating (maximum temperature 400°F, 204°C)
8 Hastelloy C276 with Teflon anti-stick coating (maximum temperature 400°F, 204°C)

EXTENSION LENGTH - 9th character (Install in schedule 40 pipe only)

2	2	2 in.
4	4	4 in.
6	6	6 in.
	A	2 in. extension with PTFE Filler Sleeve (for use with 4 inch ANSI flange ONLY) (max. temperature 400°F, 204°C)
	B	4 in. extension with PTFE Filler Sleeve (for use with 4 inch ANSI flange ONLY) (max. temperature 400°F, 204°C)
	C	6 in. extension with PTFE Filler Sleeve (for use with 4 inch ANSI flange ONLY) (max. temperature 400°F, 204°C)

CAPILLARY FILL FLUID - 10th character
A Silicone oil (DC 200)
C Silicone oil (DC 702)
D Silicone oil (DC 704)
G Glycerin/Water
P Inert Fluid
J Ethyl Alcohol
K Propylene Glycol/Water
L KTFILL-1
N Neobee M-20

SYSTEM LENGTH feet (m)- 11th and 12th characters
00 None (use with S6E 4th character "0" only)
03 to 35 Specify in one foot increments from **3 ft** (1 m) to **35 ft** (10 m). Use English equivalent of any metric length.

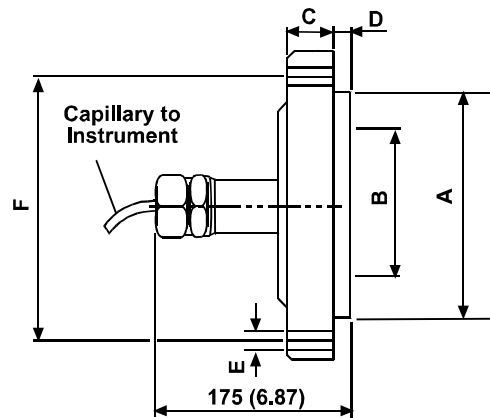
PROCESS GASKET/O-RING MATERIAL - 13th character
0 None

OPTIONS - 14th and 15th characters
00 None

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S6F Model Flanged Flush Diaphragm Seal(s)

The flush diaphragm remote seal is designed to connect to ANSI flanged pipe fitting. For liquid level measurement installations the seal connects to an ANSI flanged tank nozzle.



FLANGED FLUSH DIAPHRAGM SEAL

Maximum Working Pressure
same as rating for ANSI.

Vacuum Service

Full vacuum subject to fill fluid limits. Refer to **Fill Fluids Table A**.

Span Limits

Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**.

SIZE/RATING	DIMENSIONS mm (in)						No. OF HOLES
	A	B	C	D	E	F	
2in ANSI CL 150	92.1 (3.62)	60 (2.36)	19.5 (0.77)	9.5 (0.37)	20 (0.79)	120.5 (4.74)	4
2in ANSI CL 300	92.1 (3.62)	60 (2.36)	22.5 (0.88)	9.5 (0.37)	20 (0.79)	127 (5)	8
3in ANSI CL 150	127 (5)	89 (3.5)	24 (0.94)	9.2 (0.36)	19 (0.75)	152.5 (6)	4
3in ANSI CL 300	127 (5)	89 (3.5)	28.5 (1.12)	9.2 (0.36)	22 (0.86)	168.5 (6.63)	8
4in ANSI CL 150	157.2 (6.2)	114.3 (4.5)	24 (0.94)	9.2 (0.36)	19 (0.75)	190.5 (7.5)	8
4in ANSI CL 300	157.2 (6.2)	114.3 (4.5)	32 (1.26)	9.2 (0.36)	22 (0.86)	200.2 (7.88)	8

TABLE 'B'

Flush Diaphragm SEAL - S6F -		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	35ft
2 in.	one seal	160 in.H2O	0.4 sec	35ft	74 in. H2O	94 in. H2O	124 in. H2O	160 in. H2O
2 in.	two seals	642 in.H2O	0.02 sec	35ft	64 in. H2O	64 in. H2O	64 in. H2O	80 in. H2O
3 in.	one seal	40 in.H2O	0.09 sec.	35ft	20 in. H2O	20 in. H2O	25 in. H2O	35 in. H2O
3 in.	two seals	40 in.H2O	0.18 sec.	35ft	10 in. H2O	10 in. H2O	12 in. H2O	20 in. H2O
4 in.	one seal	40 in.H2O	0.09 sec.	35ft	10 in. H2O	10 in. H2O	10 in. H2O	12 in. H2O
4 in.	two seals	40 in.H2O	0.18 sec.	35ft	10 in. H2O	10 in. H2O	10 in. H2O	10 in. H2O

Flush Diaphragm SEAL- S6F -		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	35ft	
2 in.	one seal	1.5 in. H2O	2.29 in. H2O	3.47 in H2O	5 in H2O	1.6 in. H2O
2 in.	two seals	0.38 in. H2O	0.57 in. H2O	0.86 in. H2O	1.26 inH2O	0.4 in. H2O
3 in.	one seal	0.15 in. H2O	0.3 in. H2O	0.5 in. H2O	0.75 in. H2O	0.4 in. H2O
3 in.	two seals	0.05 in. H2O	0.05 in. H2O	0.1 in. H2O	0.2 in. H2O	0.05 in. H2O
4 in.	one seal	0.05 in. H2O	0.05 in. H2O	0.15 in. H2O	0.2 in. H2O	0.2 in. H2O
4 in.	two seals	<0.05 in. H2O	<0.05 in. H2O	<0.05 in. H2O	<0.05 in. H2O	0.02 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).
With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- (2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- (3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note : For data and characteristics different from those stated in table "B" please contact ABB Instrumentation.

ORDERING INFORMATION

S6F MODEL FLANGED FLUSH DIAPHRAGM SEAL(S)

Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description
S6F	BASE NUMBER - 1st to 3rd characters Flanged Flush Diaphragm Remote Seal
	NUMBER OF REMOTE SEALS - 4th character
0	For direct mount (requires system length code 00 at character "11 th and 12 th ")
1	One Remote Seal
2	Two Remote Seals (621E only; order 1 per transmitter)

MOUNTING CONNECTION/BACKUP FLANGE - 5th and 6th characters

Size	Rating	Material
K2	2 in.	ANSI CL 150 Carbon steel
S2	2 in.	ANSI CL 150 AISI 316 ss
L2	2 in.	ANSI CL 300 Carbon steel
31	2 in.	ANSI CL 300 AISI 316 ss
K3	3 in.	ANSI CL 150 Carbon steel
S3	3 in.	ANSI CL 150 AISI 316 ss
L3	3 in.	ANSI CL 300 Carbon steel
36	3 in.	ANSI CL 300 AISI 316 ss
K4	4 in.	ANSI CL 150 Carbon steel
3B	4 in.	ANSI CL 150 AISI 316 ss
L4	4 in.	ANSI CL 300 Carbon steel
3C	4 in.	ANSI CL 300 AISI 316 ss

OTHER WETTED MATERIAL (Not diaphragm) - 7th character
0 Same as diaphragm

DIAPHRAGM MATERIAL - 8th character

2	2	2	AISI 316 L ss (NACE)
3	3	3	Hastelloy C276
5	5		Tantalum (max. temperature 260°C/500°F)
	7	7	AISI 316 L ss
	8	8	Hastelloy C276

with Teflon anti-stick coating (maximum temperature 400°F, 204°C)
 with Teflon anti-stick coating (maximum temperature 400°F, 204°C)

EXTENSION LENGTH - 9th character
0 None

CAPILLARY FILL FLUID - 10th character

A	Silicone oil (DC 200)
C	Silicone oil (DC 702)
D	Silicone oil (DC 704)
G	Glycerin/Water
P	Inert Fluid
J	Ethyl Alcohol
K	Propylene Glycol/Water
L	KTFILL-1
N	Neobee M-20

SYSTEM LENGTH feet (m)- 11th and 12th characters
00 None (use with S6F 4th character "0" only)
03 to 35 Specify in one foot increments from **3 ft** (1 m) to **35 ft** (10 m). Use English equivalent of any metric length.

PROCESS GASKET/O-RING MATERIAL - 13th character
0 None

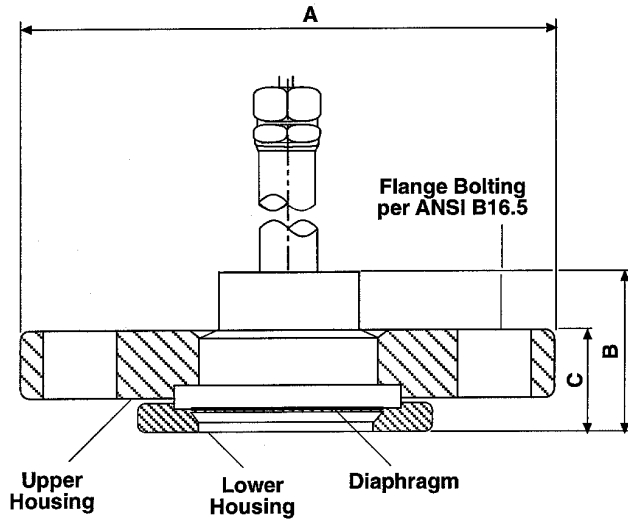
OPTIONS - 14th and 15th characters
00 None

SK20255-6 **Stainless Steel Flushing Kit** (Order Separately)
 316 Stainless Steel Flushing Ring Kit for 3 inch ANSI connection. Includes one ring, two 1/4 inch NPT flushing ports, two 316 stainless steel plugs and a Garlock gasket.

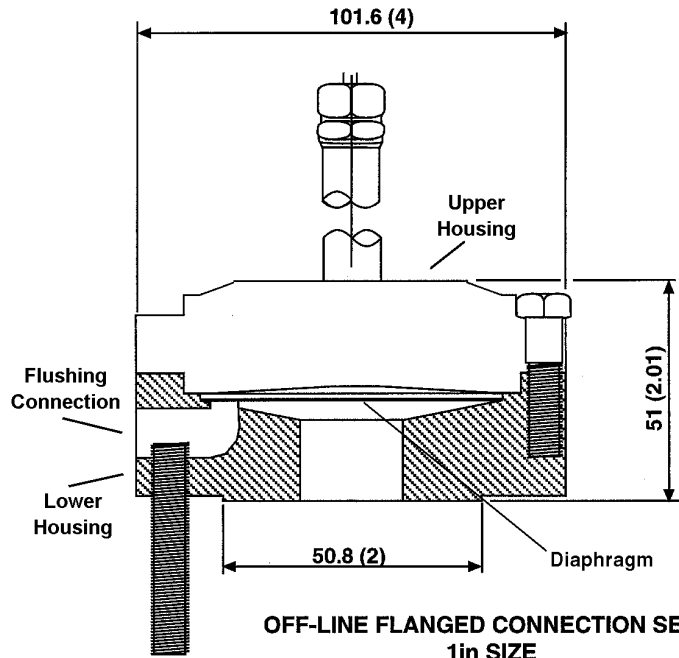
Hastelloy is a Cabot Corporation trademark

S6R Model Off-line Flanged Connection Seal(s) (Not used for absolute pressure)

The off-line flanged connection remote seals are designed to connect to ANSI flanged pipe fitting. For liquid level measurement installations the seal connects to an ANSI flanged tank nozzle. These seals are available with a flushing connection in the lower housing.



OFF-LINE FLANGED CONNECTION SEAL
1 1/2in and 2in



OFF-LINE FLANGED CONNECTION SEAL
1in SIZE

SIZE	DIMENSIONS mm (in)		
	A	B	C
1-1/2 in	127 (5)	45.7 (1.8)	33 (1.3)
2 in	152.4 (6)	48.3 (1.9)	35.6 (1.4)

Maximum Working Pressure

1.9 MPa, 19 bar, 275 psi @ 38°C (100°F).

Vacuum Service

Not suitable for pressure less than 7 kPa, 70 mbar, 1 psia.

Refer to **Fill Fluids Table A**.

Span Limits

Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**.

Process Gasket Temperature Limits

Non-asbestos composite : 343°C (650°F) max.

TABLE 'B'

Off-Line Flanged SEAL - S6R -		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	28ft
S6R	one seal	160 in.H2O	0.02 sec.	28ft	110 in. H2O	170 in. H2O	265 in. H2O	370 in. H2O
S6R	two seals	642 in.H2O	0.02 sec.	28ft	54 in. H2O	86 in. H2O	135 in. H2O	190 in. H2O

Off-Line Flanged SEAL- S6R -		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	28ft	
S6R	one seal	1.7 in. H2O	3.5 in. H2O	6 in. H2O	8 in. H2O	2.6 in. H2O
S6R	two seals	0.4 in. H2O	0.9 in. H2O	1.5 in. H2O	2 in. H2O	0.35 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

(1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).

With URL $<$ stated values, the accuracy will be two times the transmitter's specification.

(2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).

Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.

(3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note : Contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

S6R MODEL OFF-LINE FLANGED CONNECTION SEAL(S) (Not used for absolute pressure)

Select one character or set of characters from each category and specify complete catalog number.

Code No. Description

S6R **BASE NUMBER** - 1st to 3rd characters
Off-Line Flanged Connection Remote Seal (Not suitable for pressure less than 1 psia)

NUMBER OF REMOTE SEALS - 4th character
1 One Remote Seal
2 Two Remote Seals (621E only; order 1 per transmitter)

CONNECTION SIZE AND LOWER HOUSING MATERIAL (Note 1) - 5th, 6th, and 7th characters

	FA1	1" CL150 Carbon Steel	(MWP 275 psi @ 100° F)	
FB6		1" CL150 316 SST	(MWP 275 psi @ 100° F)	
FC3		1" CL150 Hastelloy C-276	(MWP 275 psi @ 100° F)	
	FD1	1-1/2" CL150 Carbon Steel	(MWP 275 psi @ 100° F)	
FE6		1-1/2" CL150 316 SST	(MWP 275 psi @ 100° F)	
FF3		1-1/2" CL150 Hastelloy C-276	(MWP 275 psi @ 100° F)	
	FH1	2" CL150 Carbon Steel	(MWP 275 psi @ 100° F)	
FJ6		2" CL150 316 SST	(MWP 275 psi @ 100° F)	
FK3		2" CL150 Hastelloy C-276	(MWP 275 psi @ 100° F)	
	611	1" CL150 Carbon Steel	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection
626		1" CL150 316 SST	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection
633		1" CL150 Hastelloy C-276	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection
	641	1-1/2" CL150 Carbon Steel	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection
656		1-1/2" CL150 316 SST	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection
663		1-1/2" CL150 Hastelloy C-276	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection
	671	2" CL150 Carbon Steel	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection
686		2" CL150 316 SST	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection
693		2" CL150 Hastelloy C-276	(MWP 275 psi @ 100° F)	WITH 1 Flushing Connection

SEAL DIAPHRAGM MATERIAL - 8th character

2	2	AISI 316 L ss
3	3	Hastelloy C276
4		Monel
5		Tantalum (max. temperature 260°C/500°F)

EXTENSION LENGTH - 9th character
0 None

CAPILLARY FILL FLUID - 10th character
A Silicone oil (DC 200)
C Silicone oil (DC 702)
D Silicone oil (DC 704)
G Glycerin/Water
P Inert Fluid
J Ethyl Alcohol
K Propylene Glycol/Water
L KTFILL-1
N Neobee M-20

SYSTEM LENGTH feet (m)- 11th and 12th characters
03 to 28 Specify in one foot increments from **3 ft** (1 m) to **28 ft** (8.5 m). Use English equivalent of any metric length.

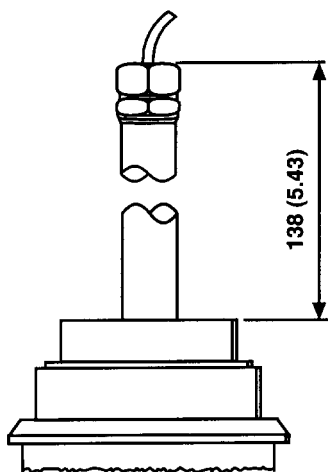
PROCESS GASKET MATERIAL - 13th character
7 Non-asbestos composite

OPTIONS - 14th and 15th characters
00 None

Hastelloy is a Cabot Corporation trademark Monel is an International Nickel Co. trademark
 Note 1 - Upper housing material is painted carbon steel, not process wetted. For 1 inch size, bolt material is carbon steel.

S6S Model Cherry Burrell I-Line and Triclamp Seal(s)

The Cherry Burrell and Triclamp remote seals are designed for connection to 2in, 3in or 4 in. Cherry Burrell I-Line and Triclover Triclamp sanitary fittings. A 4 in. V-band clamp is optionally available for the 4 in. Triclamp seal. A variety of gaskets and clamp rings for the other seals are available from the fitting manufacturers



CHERRY BURRELL I-LINE SEAL

Maximum Working Pressure

1.9 MPa, 19 bar, 275 psi
1 MPA, 10 bar, 150 psi at 150°F with V-band clamp option (only offered on 4 in. version).

Vacuum Service

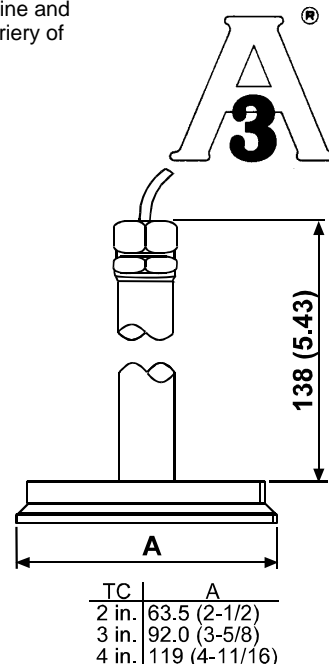
Full vacuum subject to fill fluid limits; 3in Cherry Burrell not suitable for pressure less than 7 kPa, 70 mbar, 1 psi.

Span Limits

Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**.



TRICLOVER TRICLAMP SEAL

TABLE 'B'

Cherry-Burrell (C.B.) I-Line and TriClamp (T.C.)			Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
C.B.	T.C.					3ft	10ft	20ft	35ft
2 in.	2 in.	one seal	87psi	0.009 sec.	10ft	15 psi	20 psi	N/R	N/R
2 in.	2 in.	two seals	87psi	0.018 sec.	10ft	10 psi	10 psi	N/R	N/R
3 in.	Xxx	one seal	160 in.H2O	0.02 sec.	28ft	110 in. H2O	170 in. H2O	265 in. H2O	N/R
3 in.	Xxx	two seals	642 in.H2O	0.04 sec.	28ft	54 in. H2O	86 in. H2O	135 in. H2O	N/R
4 in.	3&4 in.	one seal	160 in.H2O	0.02 sec.	35ft	30 in. H2O	40 in. H2O	65 in. H2O	95 in. H2O
4 in.	3&4 in.	two seals	160 in.H2O	0.04 sec.	35ft	20 in. H2O	20 in. H2O	30 in. H2O	50 in. H2O

Cherry-Burrell (C.B.) I-Line and TriClamp (T.C.)			Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
C.B.	T.C.		3ft	10ft	20ft	35ft	
2 in.	2 in.	one seal	9 in. H2O	14 in. H2O	N/R	N/R	5 in. H2O
2 in.	2 in.	two seals	2.2 in. H2O	3.3 in. H2O	N/R	N/R	0.5 in. H2O
3 in.	Xxx	one seal	1.7 in. H2O	3.5 in. H2O	6 in. H2O	N/R	2.6 in. H2O
3 in.	Xxx	two seals	0.4 in. H2O	0.9 in. H2O	1.5 in. H2O	N/R	0.35 in. H2O
4 in.	3&4 in.	one seal	0.4 in. H2O	0.75 in. H2O	1.35 in. H2O	2.15 in. H2O	0.8 in. H2O
4 in.	3&4 in.	two seals	0.1 in. H2O	0.2 in. H2O	0.35 in. H2O	0.5 in. H2O	0.1 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).
With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- (2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- (3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note : Contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

S6S MODEL CHERRY BURRELL "I-LINE" & TRICLAMP SEAL(S)

Select one character or set of characters from each category and specify complete catalog number.

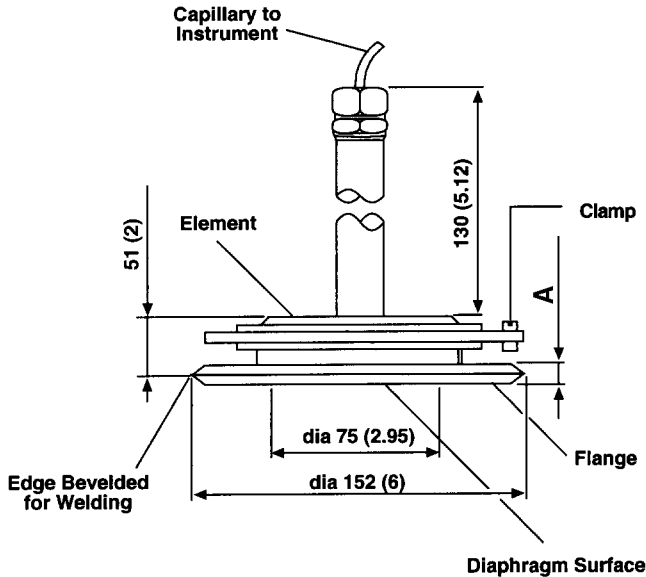
Code No.	Description
S6S	BASE NUMBER - 1st to 3rd characters Sanitary Remote Seal
	NUMBER OF REMOTE SEALS - 4th character
0	For direct mount (requires system length code 00 at character "11 th and 12 th ")
1	One Remote Seal
2	Two Remote Seals (621E only; order 1 per transmitter)
	MOUNTING CONNECTION - 5th and 6th characters
R2	2 in. Cherry Burrell I-Line
R3	3 in. Cherry Burrell I-Line (Not suitable for pressure less than 1 psia)
R4	4 in. Cherry Burrell I-Line
T2	2 in. Tri-Clover Triclamp
T3	3 in. Tri-Clover Triclamp
T4	4 in. Tri-Clover Triclamp
	OTHER WETTED MATERIAL (Not diaphragm) - 7th character
0	Same as diaphragm
	DIAPHRAGM MATERIAL - 8th character
2	AISI 316 L ss
	EXTENSION LENGTH - 9th character
0	None
	CAPILLARY FILL FLUID - 10th character
A	Silicone oil (DC 200)
G	Glycerin/Water (GRAS by FDA)
K	Propylene Glycol/Water (GRAS by FDA)
N	Neobee M-20 (GRAS by FDA)
	SYSTEM LENGTH feet (m)- 11th and 12th characters
00	None (use with S6S 4th character "0" only)
03 to 35	Specify in one foot increments from 3 ft (1 m) to 35 ft (10 m). Use English equivalent of any metric length.
	PROCESS O-RING MATERIAL - 13th character
0	None
	OPTIONS - 14th and 15th characters
00	No options
W7	4 in. V-Band Clamp for 4 in. Triclamp

S6S_S4 Model Sanitary Seal(s) with Flush Diaphragm

The sanitary remote seal with flush diaphragm is designed to connect to a 4 in. sanitary tank spud so that the diaphragm is flush with vessel inside wall. The tank spud and process O-ring are available with the seal.



NOTES: The tank spud required for connection of this seal element must be welded to the process vessel prior to connecting the seal. Refer to Installing Sanitary Tank Spuds for the spud mounting dimensions and a recommended welding and pressure testing procedure in the S6 instruction manual.



Type	A -m (in.)
with 4-inch Thin-Wall Flange	8 (0.31)
with 4-inch Thick-Wall Flange	13 (0.51)

Maximum Working Pressure

4 in. tank spud connection: 1.9 MPa, 19 bar, 275 psi
 4 in. tank spud connection with optional V-Band clamp: 1 MPa, 10 bar, 150 psi @ 38°C (100°F)

Vacuum Service

Full vacuum subject to fill fluid limits. Refer to **Fill Fluids Table A**.

Span Limits

Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**.

Process O-Ring Temperature Limits

Buna : -40 to 121°C (-40 to 250°F)
 Viton : 2 to 177°C (35 to 350°F)

TABLE 'B'

4 in "Taylor" Flush Sanitary, -S6S_S4-		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	35ft
S6S_S4	one seal	160 in.H2O	0.02 sec.	35ft	30 in. H2O	40 in. H2O	65 in. H2O	95 in. H2O
S6S_S4	two seals	160 in.H2O	0.04 sec.	35ft	20 in. H2O	20 in. H2O	30 in. H2O	50 in. H2O

4 in "Taylor" Flush Sanitary, -S6S_S4-		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	35ft	
S6S_S4	one seal	0.4 in. H2O	0.75 in. H2O	1.35 in. H2O	2.15 in. H2O	0.8 in. H2O
S6S_S4	two seals	0.1 in. H2O	0.2 in. H2O	0.35 in. H2O	0.5 in. H2O	0.1 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).
 With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- (2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
 Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- (3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note : Please contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

S6S_S4 MODEL SANITARY SEAL WITH FLUSH DIAPHRAGM

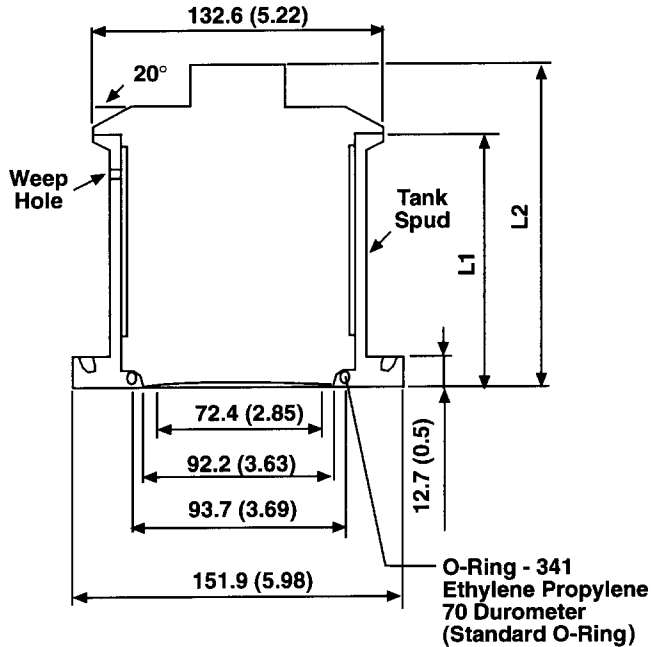
Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description
S6S	BASE NUMBER - 1st to 3rd characters Sanitary Remote Seal
	NUMBER OF REMOTE SEALS - 4th character
1	One Remote Seal
2	Two Remote Seals (621E only; order 1 per transmitter)
	MOUNTING CONNECTION - 5th and 6th characters
S4	4 in. Tank Spud Connection
	OTHER WETTED MATERIAL - 7th character
0	Same as diaphragm
	SEAL DIAPHRAGM MATERIAL - 8th character
2	AISI 316 L ss
	EXTENSION LENGTH - 9th character
0	None
	CAPILLARY FILL FLUID - 10th character
A	Silicone oil (DC 200)
G	Glycerin/Water (GRAS by FDA)
K	Propylene Glycol/Water (GRAS by FDA)
N	Neobee M-20 (GRAS by FDA)
	SYSTEM LENGTH feet (m)- 11th and 12th characters
03 to 35	Specify in one foot increments from 3 ft (1 m) to 35 ft (10 m). Use English equivalent of any metric length.
	PROCESS O-RING MATERIAL - 13th character
0	None
1	Buna
2	Viton
	OPTIONS - 14th and 15th characters
00	None
W7	4 in. V-band clamp (MWP = 150 psi at 70°F)
J1	4 in. Tank spud for tank wall up to 3/16 inch
J2	4 in. Tank spud for tank wall up to 3/8 inch

Viton is a Dupont de Nemour trademark

S6S_S5 Model Sanitary Seal(s) with Extended Diaphragm

The sanitary remote seal with extended diaphragm is designed to connect to a 4 inch schedule 5 sanitary tank spud with an extended neck so that the diaphragm is flush with vessel inside wall. The tank spud, process O-ring and V-Band clamp ring are available with the element.



SIZE	DIMENSIONS mm (in)	
	L1	L2
2 in	53.3 (2.1)	78 (3.07)
4 in	104.1 (4.1)	128.8 (5.07)
6 in	154.9 (6.1)	179.6 (7.07)

Maximum Working Pressure

4 in. schedule 5 flange extended diaphragm: 1.4 MPa, 14 bar, 200 psi.
4 in. schedule 5 optional V-Band clamp: 0.7 MPa, 7 bar, 100 psi @ 21°C (70°F).

Vacuum Service

Not suitable for pressure less than 7 kPa, 70 mbar, 1 psia. Refer to **Fill Fluids Table A**.

Span Limits

Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**.

Process O-Ring Temperature Limits

Ethylene Propylene : 149°C (300°F)

TABLE 'B'

Extended Flush Sanitary, -S6S_S5-		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	26ft
S6S_S5	one seal	160 in.H2O	0.02 sec.	28ft	110 in. H2O	170 in. H2O	265 in. H2O	370 in. H2O
S6S_S5	two seals	642 in.H2O	0.04 sec.	28ft	54 in. H2O	86 in. H2O	135 in. H2O	190 in. H2O

Extended Flush Sanitary, -S6S_S5-		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	26ft	
S6S_S5	one seal	1.7 in. H2O	3.5 in. H2O	6 in. H2O	8 in. H2O	2.6 in. H2O
S6S_S5	two seals	0.4 in. H2O	0.9 in. H2O	1.5 in. H2O	2 in. H2O	0.35 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).
With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- (2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- (3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note : Contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

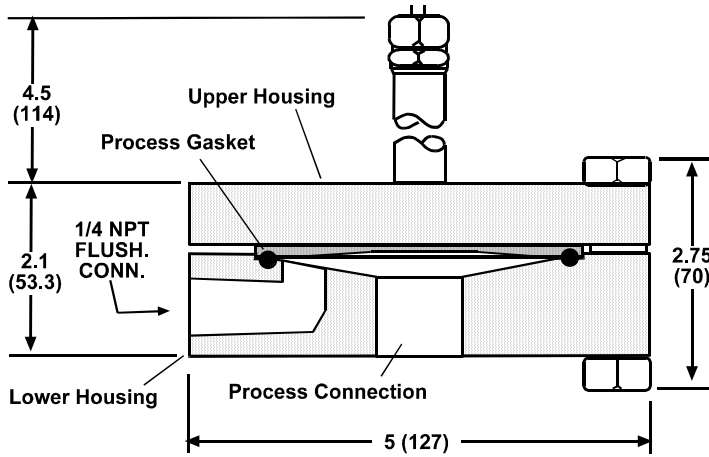
S6S_S5 SANITARY SEAL WITH EXTENDED DIAPHRAGMS

Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description
S6S	BASE NUMBER - 1st to 3rd characters Sanitary Remote Seal
	NUMBER OF REMOTE SEALS - 4th character
0	For direct mount ((requires system length code 00 at character "11 th and 12 th ")
1	One Remote Seal
2	Two Remote Seals (621E only; order 1 per transmitter)
	MOUNTING CONNECTION - 5th and 6th characters
S5	4 in. schedule 5, flange extended diaphragm (Not suitable for pressure less than 1 psia)
	OTHER WETTED MATERIAL - 7th character
0	Same as diaphragm
	SEAL DIAPHRAGM MATERIAL - 8th character
2	AISI 316 L ss
	EXTENSION LENGTH - 9th character
2	2 in.
4	4 in.
6	6 in.
	CAPILLARY FILL FLUID - 10th character
A	Silicone oil (DC 200)
G	Glycerin/Water (GRAS by FDA)
K	Propylene Glycol/Water (GRAS by FDA)
N	Neobee M-20 (GRAS by FDA)
	SYSTEM LENGTH feet (m)- 11th and 12th characters
00	None (use with S6S 4th character "0" only)
03 to 26	Specify in one foot increments from 3 ft (1 m) to 26 ft (8 m). Use English equivalent of any metric length.
	PROCESS O-RING MATERIAL - 13th character
0	None
8	Ethylene Propylene
	OPTIONS - 14th and 15th characters
00	None
W8	4 in. schedule 5 V-band clamp
W4	Tank spud for 2 in. extension (9th character = 2)
W5	Tank spud for 4 in. extension (9th character = 4)
W6	Tank spud for 6 in. extension (9th character = 6)

S6T Model Off-line Threaded Connection Seal(s)

The off-line threaded connection remote seals are designed to connect directly to a process pipe via the NPT connection in the lower housing. These elements are available with a flushing connection in the lower housing



Maximum Working Pressure

with carbon steel bolts: 14 MPa, 140 bar, 2000 psi @ 38°C (100°F).
with 316 sst bolts: 7 MPa, 70 bar, 1000 psi @ 38°C (100°F).

Vacuum Service

Full vacuum subject to fill fluid limits. Refer to **Fill Fluids Table A**.

Span Limits

Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits
Refer to **Fill Fluids Table A**.

Dimensions in inches (mm)

OFF-LINE THREADED CONNECTION SEAL

Process Gasket Temperature Limits

Synthetic fiber and graphite based gasket sealing materials are recognized to be gas and liquid permeable. The following information is provided as a guideline to permeability.

Gasket used with all fill fluids except DC 702 and 704 silicone oil:

KLINGER* C-4401, Synthetic Fiber with Nitrile Binder, 1/32" thick
Maximum Temperature: 204°C (400°F)
Sealability per ASTM F37A (1/32") 0.25 ml/hr

Gasket used with DC 702 and 704 silicone oil:

KLINGER* Flexible Graphite PMS, 1/32" thick (graphite mechanically clinched to a 0.004 inch sst tang core)
Maximum Temperature: 340°C (645°F)
Sealability per ASTM F37A (1/32") 0.50 ml/hr

These gasket materials pass standardized Hydrostatic Tests (ref. ANSI / ISA S82.03-1988)

* KLINGER is a trademark used by Thermoseal Inc., a Klinger licensee

TABLE 'B'

Off-Line Threaded SEAL - S6T -		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	35ft
S6T	one seal	160 in.H2O	0.02 sec.	35ft	30 in. H2O	40 in. H2O	65 in. H2O	95 in. H2O
S6T	two seals	160 in.H2O	0.04 sec.	35ft	20 in. H2O	20 in. H2O	30 in. H2O	50 in. H2O

Off-Line Threaded SEAL - S6T -		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	35ft	
S6T	one seal	0.4 in. H2O	0.75 in. H2O	1.35 in. H2O	2.15 in. H2O	0.8 in. H2O
S6T	two seals	0.1 in. H2O	0.2 in. H2O	0.35 in. H2O	0.5 in. H2O	0.1 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).
With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- (2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- (3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note : Contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

S6T MODEL OFF-LINE THREADED CONNECTION SEAL(S) (Not used for absolute pressure)

Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description																																																																				
S6T	BASE NUMBER - 1st to 3rd characters Off-Line Threaded Connection Remote Seal																																																																				
	NUMBER OF REMOTE SEALS - 4th character																																																																				
1	One Remote Seal																																																																				
2	Two Remote Seals (621E only; order 1 per transmitter)																																																																				
	CONNECTION SIZE AND LOWER HOUSING MATERIAL (Note 1) - 5th, 6th and 7th characters																																																																				
	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Size</th> <th style="text-align: left;">Rating</th> <th style="text-align: left;">Lower Housing Material</th> <th></th> </tr> </thead> <tbody> <tr> <td>522</td> <td>1/4 in. NPT-f</td> <td>AISI 316 ss</td> <td></td> </tr> <tr> <td>523</td> <td>1/4 in. NPT-f</td> <td>Hastelloy C276</td> <td></td> </tr> <tr> <td>552</td> <td>1/2 in. NPT-f</td> <td>AISI 316 ss</td> <td></td> </tr> <tr> <td>553</td> <td>1/2 in. NPT-f</td> <td>Hastelloy C276</td> <td></td> </tr> <tr> <td>582</td> <td>1 in. NPT-f</td> <td>AISI 316 ss</td> <td></td> </tr> <tr> <td>583</td> <td>1 in. NPT-f</td> <td>Hastelloy C276</td> <td></td> </tr> <tr> <td>5B2</td> <td>1-1/2 in. NPT-f</td> <td>AISI 316 ss</td> <td></td> </tr> <tr> <td>5B3</td> <td>1-1/2 in. NPT-f</td> <td>Hastelloy C276</td> <td></td> </tr> <tr> <td>5E2</td> <td>1/4 in. NPT-f</td> <td>AISI 316 ss</td> <td>WITH 1 flushing connection</td> </tr> <tr> <td>5E3</td> <td>1/4 in. NPT-f</td> <td>Hastelloy C276</td> <td>WITH 1 flushing connection</td> </tr> <tr> <td>5K2</td> <td>1/2 in. NPT-f</td> <td>AISI 316 ss</td> <td>WITH 1 flushing connection</td> </tr> <tr> <td>5K3</td> <td>1/2 in. NPT-f</td> <td>Hastelloy C276</td> <td>WITH 1 flushing connection</td> </tr> <tr> <td>5N2</td> <td>1 in. NPT-f</td> <td>AISI 316 ss</td> <td>WITH 1 flushing connection</td> </tr> <tr> <td>5N3</td> <td>1 in. NPT-f</td> <td>Hastelloy C276</td> <td>WITH 1 flushing connection</td> </tr> <tr> <td>5P2</td> <td>1-1/2 in. NPT-f</td> <td>AISI 316 ss</td> <td>WITH 1 flushing connection</td> </tr> <tr> <td>5P3</td> <td>1-1/2 in. NPT-f</td> <td>Hastelloy C276</td> <td>WITH 1 flushing connection</td> </tr> </tbody> </table>	Size	Rating	Lower Housing Material		522	1/4 in. NPT-f	AISI 316 ss		523	1/4 in. NPT-f	Hastelloy C276		552	1/2 in. NPT-f	AISI 316 ss		553	1/2 in. NPT-f	Hastelloy C276		582	1 in. NPT-f	AISI 316 ss		583	1 in. NPT-f	Hastelloy C276		5B2	1-1/2 in. NPT-f	AISI 316 ss		5B3	1-1/2 in. NPT-f	Hastelloy C276		5E2	1/4 in. NPT-f	AISI 316 ss	WITH 1 flushing connection	5E3	1/4 in. NPT-f	Hastelloy C276	WITH 1 flushing connection	5K2	1/2 in. NPT-f	AISI 316 ss	WITH 1 flushing connection	5K3	1/2 in. NPT-f	Hastelloy C276	WITH 1 flushing connection	5N2	1 in. NPT-f	AISI 316 ss	WITH 1 flushing connection	5N3	1 in. NPT-f	Hastelloy C276	WITH 1 flushing connection	5P2	1-1/2 in. NPT-f	AISI 316 ss	WITH 1 flushing connection	5P3	1-1/2 in. NPT-f	Hastelloy C276	WITH 1 flushing connection
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2	AISI 316 L ss																																																																				
3	Hastelloy C276																																																																				
4	Monel																																																																				
	BOLT MATERIAL - 9th character																																																																				
E	Carbon steel (MWP = 2000 psi @ 100°F)																																																																				
F	316 sst (MWP = 1000 psi @ 100°F)																																																																				
	CAPILLARY FILL FLUID - 10th character																																																																				
A	Silicone oil (DC 200)																																																																				
C	Silicone oil (DC 702)																																																																				
D	Silicone oil (DC 704)																																																																				
G	Glycerin/Water																																																																				
P	Inert Fluid																																																																				
J	Ethyl Alcohol																																																																				
K	Propylene Glycol/Water																																																																				
L	KTFILL-1																																																																				
N	Neobee M-20																																																																				
03 to 28	SYSTEM LENGTH feet (m)- 11th and 12th characters Specify in one foot increments from 3 ft (1 m) to 28 ft (8.5 m). Use English equivalent of any metric length.																																																																				
	UNUSED CHARACTER - 13th character																																																																				
0	Not Used																																																																				
	OPTIONS - 14th and 15th characters																																																																				
00	None																																																																				

Note 1 - Upper housing material is 304 stainless steel, not process wetted

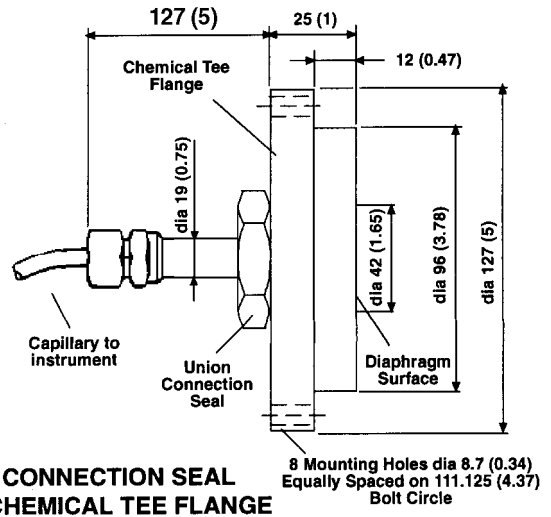
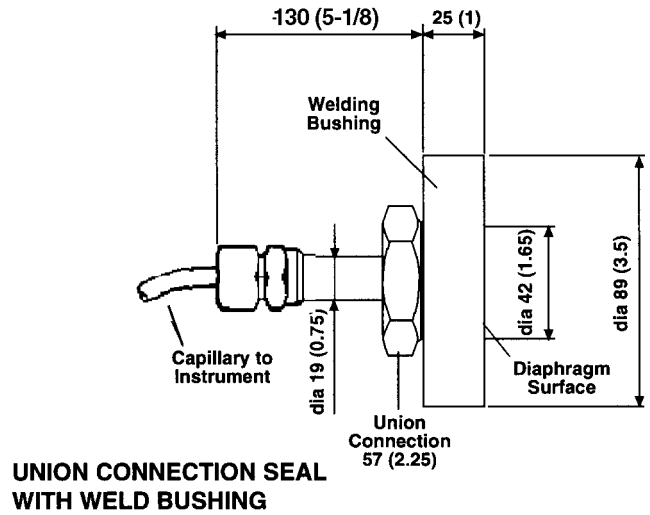
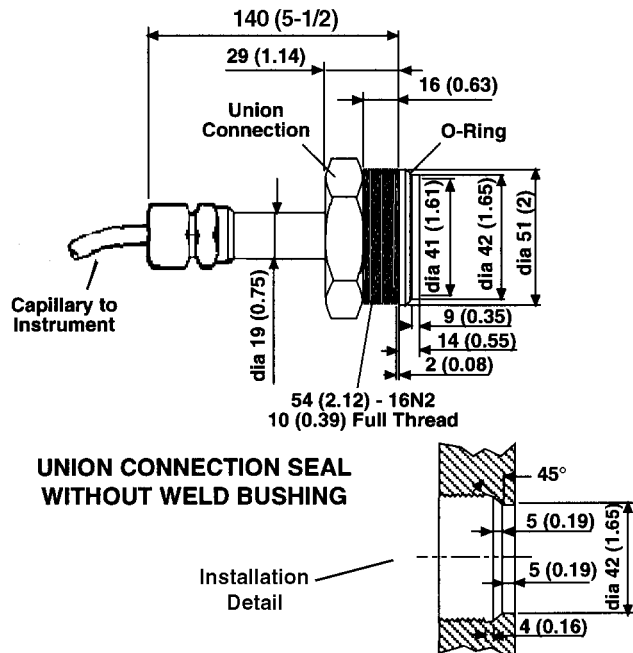
Hastelloy is a Cabot Corporation trademark

Monel is an International Nickel Co. trademark

Viton is a Dupont de Nemour trademark

S6U Model Union Connection Seal(s) (To be used only for gauge pressure)

The union connection remote seal are used exclusively for pressure measurement with the Gauge Pressure Transmitter. The seal is available with an optional weld bushing, or with an optional chemical tee flange. The remote seal with a weld bushing includes a bushing which provides the mating surface for the seal element. The union connection seal with a chemical tee flange is designed to connect to any process fitting which accepts a chemical tee seal element (refer to Chemical Tee Seal for more information). The union seal connects to the chemical tee flange which serves as an adaptor to permit connection of the union seal to a chemical tee type fitting.



Maximum Working Pressure

Union Connection: 10.3 MPa, 103 bar, 1500 psi maximum
 Union Connection with Weld Bushing : 1500 psi maximum
 Union Connection with Chemical Tee Flange : 2 MPa, 20 bar, 300 psi maximum

Vacuum Service

Full vacuum subject to fill fluid limits. Refer to **Fill Fluids Table A**.

Span Limits

Minimum span/maximum capillary length according to relevant specification formulas.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**.

Process O-Ring Temperature Limits

Silicone rubber : 204°C (400°F).
 Teflon TFE : 260°C (500°F).

TABLE 'B'

Union Connection SEAL - S6U -		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3ft	10ft	20ft	35ft
S6U	one seal	642 in.H2O	0.009 sec.	10ft	15 psi	20psi	N/R	N/R

Union Connection SEAL- S6U -		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3ft	10ft	20ft	35ft	
S6U	one seal	9 in. H2O	14 in. H2O	N/R	N/R	5 in. H2O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

(1) With URL \geq stated values, the accuracy as per transmitter (Turndown \leq 10).

With URL $<$ stated values, the accuracy will be two times the transmitter's specification.

(2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).

Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.

(3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note : Contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

S6U MODEL THREADED UNION CONNECTION SEAL(S) (To be used only for gauge pressure)

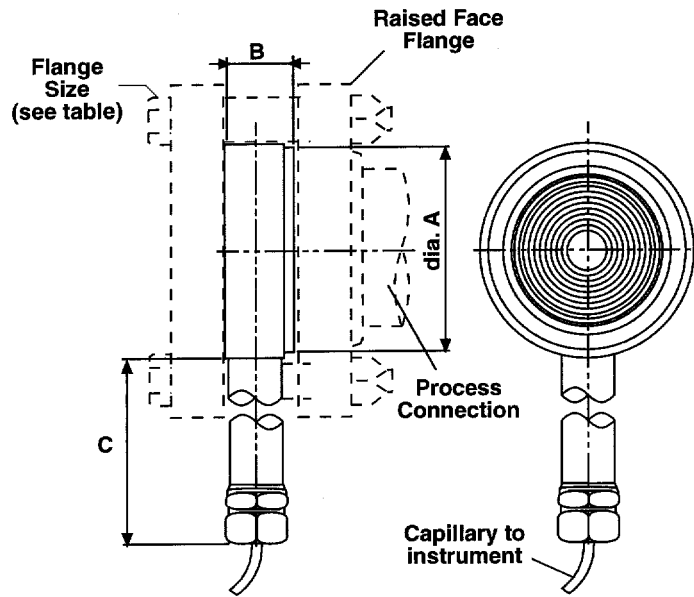
Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description
S6U	BASE NUMBER - 1st to 3rd characters Threaded Union Remote Seal (do not use with sensor P or N)
1	NUMBER OF REMOTE SEALS - 4th character One Remote Seal
U1	MOUNTING CONNECTION - 5th and 6th characters Union connection
0	OTHER WETTED MATERIAL (Not diaphragm) - 7th character Same as diaphragm
2	DIAPHRAGM MATERIAL - 8th character AISI 316 L ss (NACE)
3	Hastelloy C 276
0	EXTENSION LENGTH - 9th character None
A	CAPILLARY FILL FLUID - 10th character Silicone oil (DC 200)
C	Silicone oil (DC 702)
D	Silicone oil (DC 704)
G	Glycerin/Water
P	Inert Fluid
J	Ethyl Alcohol
K	Propylene Glycol/Water
L	KTFILL-1
N	Neobee M-20
03 to 10	SYSTEM LENGTH feet (m)- 11th and 12th characters Specify in one foot increments from 3 ft (1 m) to 10 ft (3.3 m). Use English equivalent of any metric length.
3	PROCESS O-RING MATERIAL - 13th character Silicone rubber
4	Teflon TFE
00	OPTIONS - 14th and 15th characters No options
W1	AISI 316 ss weld bushing
W2	Chemical tee flange includes PTFE gasket

Hastelloy is a Cabot Corporation trademark

S6W Model Wafer Seal(s)

The wafer remote seal is designed to be clamped between two ANSI raised face flanges. The diaphragm side of the seal faces the process flange and a blind back-up flange is used on the other side of the seal.



SIZE	DIMENSIONS mm (in)		
	A	B	C
1-1/2 in	76 (3.0)	32 (1.25)	139.7 (5.5)
3 in	127 (5.0)	24 (0.94)	143.7 (5.66)

Maximum Working Pressure

ANSI Flanges : same as flange rating
 1-1/2 in.: 2000 psi, 14 MPa
 3 in.: 1500 psi, 10 MPa

Vacuum Service

Full vacuum subject to fill fluid limits. Refer to **Fill Fluids Table A**.

Process Temperature Limits

Same as fill fluid limits. Refer to **Fill Fluids Table A**

TABLE 'B'

WAFER SEAL - S6W -		Lowest URL (Note 1)	Response per 3 ft Capillary (Note 2)	Max. Capillary Length	Minimum Span vs Capillary Length			
					3 ft	10 ft	20 ft	35 ft
1 1/2 in.	1 seal	642 in H ₂ O	0.09 sec.	35 ft	11 psi	14 psi	18 psi	24 psi
1 1/2 in.	2 seals	87 psi	0.18 sec.	35 ft	6 psi	7 psi	9 psi	12 psi
3 in.	1 seal	40 in H ₂ O	0.09 sec.	35 ft	20 in H ₂ O	20 in H ₂ O	25 in H ₂ O	35 in H ₂ O
3 in.	2 seals	40 in H ₂ O	0.18 sec.	35 ft	10 in H ₂ O	10 in H ₂ O	12 in H ₂ O	20 in H ₂ O

WAFER SEAL- S6W -		Ambient Temperature Effect per 50°F vs Capillary Length (ETxc)				Process Temp Error per 50°F (Es)
		3 ft	10 ft	20 ft	35 ft	
1 1/2 in.	1 seal	5 in. H ₂ O	7 in. H ₂ O	10 in. H ₂ O	14 in. H ₂ O	9 in H ₂ O
1 1/2 in.	2 seals	1 in. H ₂ O	1.5 in. H ₂ O	2.5 in. H ₂ O	3.5 in. H ₂ O	1 in H ₂ O
3 in.	1 seal	0.15 in. H ₂ O	0.3 in. H ₂ O	0.5 in. H ₂ O	0.75 in. H ₂ O	0.4in H ₂ O
3 in.	2 seals	0.05 in. H ₂ O	0.05 in. H ₂ O	0.1 in. H ₂ O	0.2 in. H ₂ O	0.05in H ₂ O

Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (1) With URL \geq stated values, the accuracy as per transmitter (Turndown - 10).
 With URL $<$ stated values, the accuracy will be two times the transmitter's specification.
- (2) Response is defined as one time constant to be added to the transmitter time constant value (see transmitter specification sheet).
 Multiply by time constant ratio (see **Fill Fluids Table A**) for different fill fluid.
- (3) ETxc is the ambient error including capillary and transmitter body fill. Es is the process error including the remote seal portion only.

Note

Please contact us for data and characteristics different from those stated in table "B".

ORDERING INFORMATION

S6W MODEL WAFER SEAL(S)

Select one character or set of characters from each category and specify complete catalog number.

Code No. Description

S6W **BASE NUMBER** - 1st to 3rd characters
Wafer Remote Seal

NUMBER OF REMOTE SEALS - 4th character
1 One Remote Seal
2 Two Remote Seals (621E only; order 1 per transmitter)

F1		1 - 1/2 in. ANSI
	F3	3 in. ANSI

MOUNTING CONNECTION - 5th and 6th characters

0 **OTHER WETTED MATERIAL** (Not diaphragm) - 7th character
Same as diaphragm

2	2	AISI 316 L ss (NACE)
3	3	Hastelloy C 276
	4	Monel
5	5	Tantalum (max. temperature 260°C/500°F)
	7	AISI 316 L ss with Teflon anti-stick coating
	8	Hastelloy C276 with Teflon anti-stick coating

DIAPHRAGM MATERIAL - 8th character

0 **EXTENSION LENGTH** - 9th character
None

CAPILLARY FILL FLUID - 10th character

A Silicone oil (DC 200)
C Silicone oil (DC 702)
D Silicone oil (DC 704)
G Glycerin/Water
P Inert Fluid
J Ethyl Alcohol
K Propylene Glycol/Water
L KTFILL-1
N Neobee M-20

03 to 35 **SYSTEM LENGTH** feet (m)- 11th and 12th characters
Specify in one foot increments from **3** ft (1 m) to **35** ft (10 m). Use English equivalent of any metric length.

0 **PROCESS GASKET MATERIAL** - 13th character
None

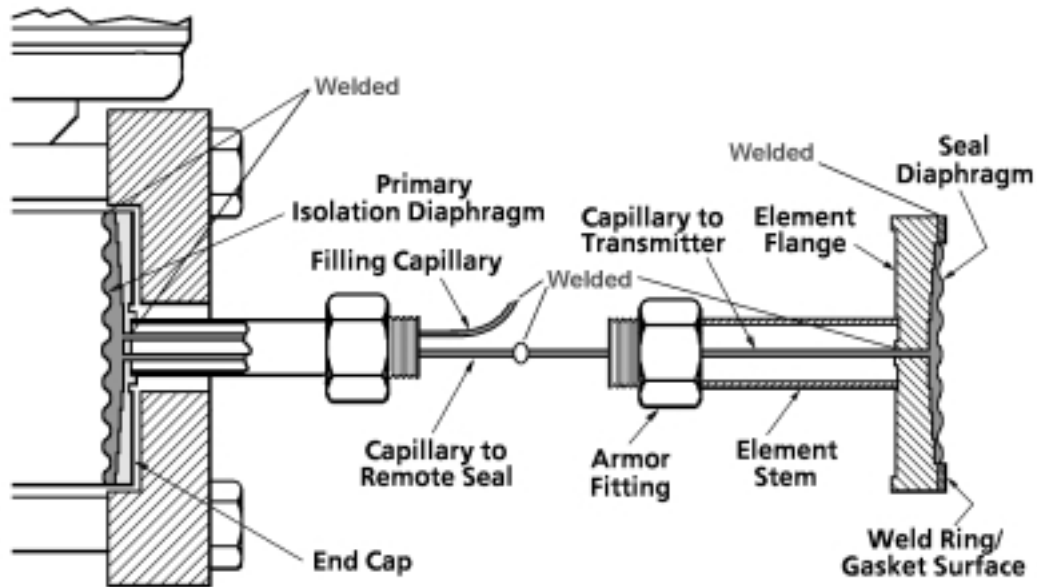
00	00	None
K1		1-1/2" ANSI CL150 Carbon Steel Flange
L1		1-1/2" ANSI CL300 Carbon Steel Flange
P1		1-1/2" ANSI CL1500 Carbon Steel Flange
	K3	3" ANSI CL150 Carbon Steel Flange
	L3	3" ANSI CL300 Carbon Steel Flange
	S3	3" ANSI CL150 316 SST Flange
	T3	3" ANSI CL300 316 SST Flange

SK20255-6 **Stainless Steel Flushing Kit** (Order Separately)
316 Stainless Steel Flushing Ring Kit for 3 inch ANSI connection. Includes one ring, two 1/4 inch NPT flushing ports, two 316 stainless steel plugs and a Garlock gasket.

Hastelloy is a Cabot Corporation trademark

Monel is an International Nickel Co. trademark

All Welded Construction Exclusively from ABB



- All capillary and flange joints are welded
- Fill Fluid is contained in a hermetically sealed environment
- Air can't be drawn into the system when the process is under vacuum
- Workmanship carries the same warranty as the transmitter, even under full vacuum

ABB

The Company's policy is one of continuous product improvement and the right is reserved to modify specifications contained herein without notice.

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S6/S6USA Rev.00.1

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