

Specifications

600T Series Smart Pressure Transmitters with S6 Series Remote Seals

Models

621R (differential)

621S (single sided)

621P (gauge)

621V (absolute)

- **3 Year Warranty**
- **Base accuracy : $\pm 0.10\%$**
- **Reduced volume flanges with all-welded or gaskets construction**
 - ensure the best solution performing to the specification at extreme operating conditions down to full vacuum and at high temperature.
- **Digital sensor technology**
 - ensures high performance at all process conditions
- **Unique output characterization proportional to vessel volume irrespective of shape**
- **Unique on-line compensation for temperature and static pressure effects**
- **Modular design**
 - allows easy on-site service
 - electronic module replacement without recalibration or performance loss
- **Digital communications HART® 5**
 - allows use of standard and Universal HART configurators
- **Upgradeable to fieldbus platform**
 - protects investment if future enhancement required

From the Leader in Remote Seals



***600T Series Remote Seal Transmitter
A complete family of process transmitters providing high performance in real operating conditions.***

Accurate, Stable and Reproducible Measurements

The 600T Series features a unique digital sensing system that provides extremely high resolution of differential pressure measurement and exceptional long-term stability.

Advanced sensor technology coupled with microcontroller based electronics minimizes static pressure and ambient temperature errors.



Digital Sensing Provides Better Performance

At the heart of the 600T Series is a unique sensing and measuring system which converts differential pressure, static pressure and ambient temperature measurements directly into a proprietary Standardized Digital Signal (SDS) output for use by the electronics module in the transmitter housing. It accomplishes this by using a dual inductive sensing element, a precise temperature sensor and a multi-mode oscillator.

The multi-mode oscillator is an Application Specific Integrated Circuit (ASIC) that generates the SDS based on sequential switching of the dual inductance and the temperature measurement.

This all-digital design eliminates the analog to digital converter and the errors and drift associated with it and provides precise, stable and reproducible measurements.

Dual ASIC's Increases Processing Power

The electronics module also incorporates ASIC and surface mount technology. This ASIC accepts the SDS input from the sensor module and interfaces the microcontroller which performs precise primary variable linearization, compensating for the combined effects of sensor non linearity, static pressure and temperature.

Static Pressure Transmitter and Temperature Effects

Part of the manufacturing process includes sensor characterization: static pressure (for model 621R) and temperature response data is taken over the entire operating range, and stored in the non-volatile memory. This data defines how the sensor will behave, in an application, when exposed to these effects. The primary sensor is instrumented with static pressure and temperature sensors. During operation on-line environmental measurements are taken. The microcontroller compares these measurements to the characterization data. From this comparison, the actual transmitter output is corrected for the effects of static pressure and temperature variation.

Advanced Electronics Ensures Reliability

The microcontroller-based electronics is designed to exceed sixty years Mean Time Between Failure (MTBF).

Seal System Leading in Performance Quality and Reliability

The remote diaphragm seal variants of the 600T series of electronic transmitters are designed to provide superior overall performance for measurements of gauge and absolute pressure, differential pressure, linear flow, liquid level and density, while preventing the process fluids from coming into contact with the transmitter sensor. Differential pressure transmitters have either two identical remote seals or a single remote seal on the high side for liquid level applications. Gauge and absolute pressure transmitters have a single remote seal. Our filling techniques and diaphragm design have been refined over the past years and guarantee a product of unrivalled quality and reliability.

The complete line of seals includes wafer, chemical tee, flush and extended flanged, off-line, union seals, sanitary and aseptic elements, with a comprehensive selection of filling fluids and diaphragm materials; the capillary is corrosion-resistant armoured construction.

Turndown Ratios from 1 : 1 to 20 : 1

Differential units have a turndown range from 0.5 : 1, where the maximum calibrated span is actually twice the upper range limit of the transmitter (from minus to plus the upper range limit). This reduces the number of transmitters both operationally and in inventory.

NACE Material

600T Series meets NACE Specification MR0175 latest revision.

Dual Compartment Housing

Electronics housing is immune to Radio Frequency Interference (RFI) and provides a convenient integral junction box for field wiring connections.

Local Zero and Span Adjustments Standard

The zero and span adjustment are inductively coupled to the electronics so there is no housing penetration. A moving magnet induces a "digital" current in a coil located inside the housing. This ON/OFF current is the calibration command. No penetration eliminates the risk of water or process entering the housing through the adjustments which would lead to transmitter failure. There are three ways to disable the adjustments. The first is by activating the transmitter security jumper. The second is by removing the adjustments. The third is through the hand-held Communicator software lock-out sequence which is password protected to allow total transmitter security.

Transmitter Diagnostics

The transmitter continuously performs self-tests. Self-tests include sensor and electronics over range condition, input circuitry and configuration integrity and many others. Transmitter diagnostic status is available during communication interface (i.e. with hand terminal or other HART® host) and also on the local integral digital display (electrical option code "A") for fast verification.

A user selectable loop test output current can be selected to help analyze the other components of the loop.

Enhanced Remote Communications

600T transmitters communicate with our P.C. based configuration software, the our KHT hand terminal, the HART model 275 Universal Communicator and any host interface supporting the HART® protocol.



The Configuration Package

Take the Work Out of Transmitter Management

Unlike other remote transmitter interfaces, the 600T configuration package consists of two main elements: the configurator software and the hand-held communicator. Designed for the P.C. environment, this package has the capability to:

- assemble a transmitter data base off-line,
- provide both a disk and a printed record ideal for ISO 9000 record keeping requirements,
- download to the transmitter either with a standard modem or via the hand-held communicator.

A two-level password protection is provided for all changes in the transmitter data base.

Configurations stored within the communicator can be read, written and deleted from the management operations of the P.C. software configurator. Also, file back-ups and or different versions of the data base can be created and maintained using the P.C. based configurator.

Maintenance, replace and reporting operations help to manage transmitters more efficiently and increase process security.

The 600T Series is Field Repairable

Unlike other smart transmitters, the 600T characterization data is stored with the non-volatile memory in the sensor module, not in the electronics microcontroller. This means the electronics module can be field replaced without loss of performance and without having to remove separate correction PROMs. Re-calibration is not required which saves time and money.

User Selectable Output Functions

Output characterization allows the following applications:

- Linear : Differential pressure and liquid level measurements
- Sq.root : The 4 to 20 mA signal can be made proportional to the square root of the differential pressure applied to the transmitter. It is normally used together with a primary element such as orifice plate, integral orifice, Venturi tube, Dall tube, etc. Two operating modes: smooth or step change to differential pressure measurement at 20% flow provides optimum applicability.
- $x^{3/2}$: Output linear with open channel flow measurement using rectangular/trapezoidal weirs (Hamilton-Smith, Rehbock/Cipolletti)
- $x^{5/2}$: Output linear with open channel flow measurement using V-notch weir (Kindsvater-Shen)
- Free programmable (5th-order polynomial) : Output linear with volumes of liquids contained into spherical tanks or cylindrical horizontal vessel or any curved vessels. This greatly improves both process and level measurement accuracy.
- User selected constant current for loop testing.

Optional Indicators

The LCD display plugs into the electronics module, reads the digital signal, and shows the digital output in pressure engineering units or percent of analog range values. It also provides diagnostic messages for troubleshooting the transmitter.

The LCD output meter is user-adjustable and can be scaled to read in engineering units. It plugs into the transmitter field terminal block and then reads the actual 4 to 20 mA output signal.

Both indicators can be installed into one transmitter, if required.

An analog output meter is also available for those applications where the transmitter operates outside the temperature limits of the LCDs, or user preference.



TRANSMITTER FUNCTIONAL SPECIFICATIONS

Service : Liquid, gas and vapor applications.

Sensor	Lower and Upper Range Limits (LRL and URL)			Static Pressure Limits (DP) Overpressure Limits (GP)
	Model 621R differential	Model 621P gauge	Model 621V absolute	
B	-40 and +40 inH ₂ O -10 and +10 kPa -100 and +100 mbar	-40 and +40 inH ₂ O -10 and +10 kPa -100 and +100 mbar		Full Vacuum to 2000 psi, 14 MPa, 140 bar; May be limited by S6 remote seal
C	-160 and +160 inH ₂ O -40 and +40 kPa -400 and +400 mbar	-160 and +160 inH ₂ O -40 and +40 kPa -400 and +400 mbar	0 and +300 mmHg abs 0 and +40 kPa abs 0 and +400 mbar abs	
D	-642 and +642 inH ₂ O -160 and +160 kPa -1600 and +1600 mbar	-401 and +642 inH ₂ O -100 and +160 kPa -1000 and +1600 mbar	0 and +1200 mmHg abs 0 and +160 kPa abs 0 and +1600 mbar abs	
E	-87 and +87 psi -600 and +600 kPa -6 and +6 bar	-14.7 and +87 psi -100 and +600 kPa -1 and +6 bar	0 and +87 psi abs 0 and +600 kPa abs 0 and +6 bar abs	
F	-348 and +348 psi -2400 and +2400 kPa -24 and +24 bar	-14.7 and +348 psi -100 and +2400 kPa -1 and +24 bar	0 and +348 psi abs 0 and +2400 kPa abs 0 and +24 bar abs	
H	-1015 and +1015 psi -7000 and +7000 kPa -70 and +70 bar	-14.7 and +1015 psi -100 and +7000 kPa -1 and +70 bar	0 and +1015 psi abs 0 and +7000 kPa abs 0 and +70 bar abs	
U	-2320 and +2320 psi -16000 and +16000 kPa -160 and +160 bar	-14.7 and +2320 psi -100 and +16000 kPa -1 and +160 bar	0 and +2320 psi abs 0 and +16000 kPa abs 0 and +160 bar abs	

Turndown ratio (TD) : up to 20 : 1 (10 : 1 for Absolute)

Damping (electronic)

Selectable time constant : 0, 0.25, 0.5, 1, 2, 4, 8 or 16 sec.

Span limits

Maximum span = URL

Minimum span = URL/TD max. unless otherwise stated in the S6 Series remote seal section.

Zero suppression and elevation

Zero and span can be adjusted to any value as long as:

- calibrated span \geq minimum span
- upper range value (URV = 100%) \leq Upper Range Limit (URL)
- lower range value (LRV = zero) \geq Lower Range Limit (LRL)

Temperature limits : (see also remote seal filling fluid data and hazardous atmosphere certificate limits).

Ambient

-40 and +85°C (-40 and +185°F)

with LCD indicators : -20 and +80°C (-4 and +176°F)

Storage

-50 and +120°C (-58 and +248°F)

with LCD indicators: -40 and +85°C (-40 and +185°F)

Proof pressure

The transmitter can be exposed to a line pressure up to 28 MPa, 280 bar, 4000 psi without leaking. Meets SAMA PMC 27.1.

Transmitter Time Constant : @ 25°C with DC200 fill fluid

- 0.9 sec for sensor code B
- 0.25 sec for sensor code C
- 0.15 sec for sensor code D
- \leq 0.01 sec. for other sensors

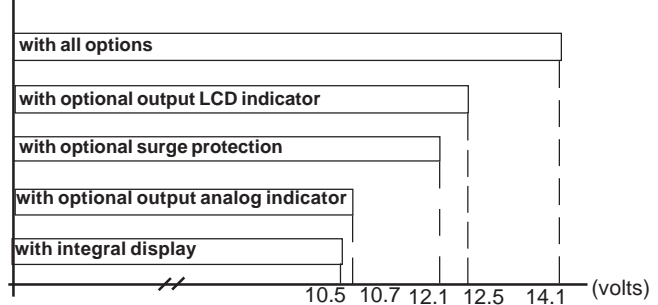
The total time constant is the sum of the Transmitter plus Seal time constant (see remote seal data sheet).

Power supply

The transmitter operates from 10.5 to 42 Vdc with no load and is protected against reverse polarity connection (a load up to 620Ω allows operations up to 55 Vdc).

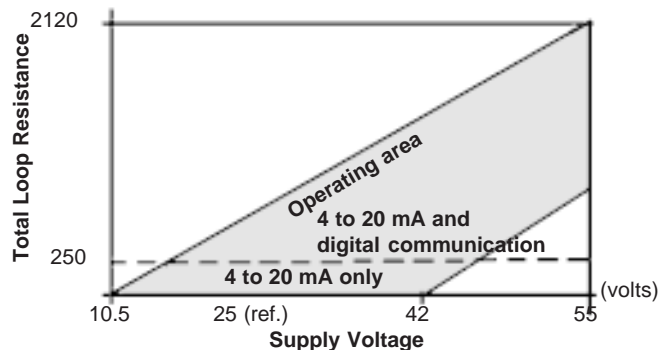
For EEx ia and intrinsically safe (FM, CSA and SAA) approval power supply must not exceed 30Vdc.

MINIMUM OPERATING VOLTAGES



Load limitations - total loop resistance :

$$R(\text{k}\Omega) = \frac{\text{Supply voltage} - \text{min. operating voltage (Vdc)}}{21}$$



Optional indicators

Output meter (user adjustable)

- LCD : 3 1/2-digit with 10 mm (3/8 in) high, 7-segment characters. Engineering unit labels are provided. LCD output meter may be calibrated within the range -1999 to + 1999 with a span adjustable between 200 and 3998 units. (Display of decimal point, if required, is switch selectable)
- analog : 36 mm (1.4 in) scale on 90°

Integral display

- LCD: 4-digit with 8 mm. (5/16 in) high, 9-segment alphanumeric characters.
User-definable display mode :
 - process variable in pressure engineering units,
 - percent of range,
 - process variable in engineering units and percent of range alternating every 2 seconds,
 - process variable in engineering units and digital output (4 to 20 mA) alternating every 2 seconds.Display also indicates diagnostic messages.

Turn on time

Operation within specification in less than 2 sec. with minimum damping.

Optional surge protection

Up to 2.5 kV (5 kA discharge current) of 8 μ s rise time/20 μ s decay.

Insulation resistance

> 100 M Ω @ 1000 Vdc.

Output signal

Two-wire 4 to 20 mA dc, user-selectable for linear or square root output, power of 3/2 or 5/2, 5th order programmable polynomial output. Square root output is linear with flow above 20% of flow and linear with input pressure below 20% of flow; smooth or step change is user-selectable.

Digital process variable (% , mA or engineering units) superimposed on 4 to 20 mA signal. HART[®] communication protocol.

Output current limit

Overload condition

- Lower limit : approx. 3.8 mA dc
- Upper limit : approx. 24 mA dc

Transmitter failure mode

The output signal can be user-selected to a value of 3.9 or 21 mA on gross transmitter failure condition, detected by self-diagnostics.

TRANSMITTER PERFORMANCE

Reference conditions and zero based range for transmitter with isolating diaphragms in AISI 316 L ss and silicone oil (DC200) fill and digital trim values equal to 4-20 mA span end points, in linear mode.

Unless otherwise specified, errors are quoted as % of span.

Refer to seals data sheet for accuracy change and additional errors due to temperature and static pressure effects.

Accuracy

Accuracy rating (*) :

- $\pm 0.10\%$ for TD from 1:1 to 10:1
- $\pm (0.010 \times \frac{URL}{Span})\%$ for TD from 10:1 to 20:1

(*) including combined effects of terminal based linearity, hysteresis and repeatability.

Optional indicators accuracy

- integral display (microprocessor driven) : no error
- analog output meter : $\pm 2\%$ full scale deflection
- LCD output meter : $\pm 0.1\%$ of calibrated span ± 1 unit

Operating influences

Ambient temperature per 30 K (54°F) change between the limits of - 40°C and + 85°C (-40 to +185°F)

- Zero error : $\pm (0.10 \times TD)\%$
 - Span error : $\pm 0.13\%$ of reading
- Multiply by 1.5 the effects for sensor code B

Optional LCD output meter ambient temperature

per 1 K (1.8°F) change between the limits of -20 and +80°C (-4 and + 176°F)

Total effect : $\pm (0.0002 \times \text{span units} + 0.1)$ of reading.

Static pressure per 1015 psi , 7 MPa, or 70 bar

- zero error (can be calibrated out at line pressure) :
 - $\pm (0.12 \times TD)\%$ for sensors code C, D, E, F, H, U
 - $\pm (0.15 \times TD)\%$ for sensor code Bfor line pressures from 2320 psi, 0 to 16 MPa, or 160 bar.
- span error :
 - $\pm 0.20\%$ of reading for sensors code C, D, E, F, H, U
 - $\pm 0.22\%$ of reading for sensor code B.for line pressures from 2320 psi, 0 to 16 MPa, or 160 bar.

Supply voltage

Within voltage/load specified limits the total effect is less than 0.005% of URL per volt.

Load

Within load/voltage specified limits the total effect is negligible.

EMI/RFI

Total effect : less than 0.10% of span from 20 to 1000 MHz and for field strengths up to 30 V/m when tested with shielded conduit and grounding, with or without meter. Meets CE standards IEC 801.

Vibration

Total effect: $\pm 0.05\%$ of URL from 1 to 2000 Hz and acceleration up to 20 m/s² (2g) in any axis.

Common mode interference

No effect from 100 V rms @ 50/60 Hz, or 50 Vdc.

Series mode interference

No effect from 1 V rms @ 50/60 Hz.

Mounting position

Rotations in plane of diaphragm have no effect. A tilt to 90° from vertical causes a zero shift up to 2 inches H₂O, 0.5 kPa, or 5 mbar, which can be corrected with the zero adjustment. No span effect.

Stability

$\pm 0.10\%$ of URL over a twelve-month period

TRANSMITTER PHYSICAL SPECIFICATIONS

Materials

Sensor isolating diaphragms

AISI 316 L ss

Sensor body : AISI 316 L ss

Sensor fill fluid

Silicone oil (DC200) or inert fill

Body flanges

AISI 316 L ss

Bolts and nuts

- Zinc plated carbon steel bolts 8.8 per UNI 5737 (ISO 4014) and nuts class 6.S per UNI 3740/4 (ISO 898/2).
- Zinc plated alloy steel bolts per ASTM-A-193-77a grade B7M and nuts per ASTM A194/A 194 M-90 grade 2HM, in compliance with NACE MR0175 Class II.
- AISI 316 ss bolts Class A4-80 and nuts Class A4-70 per UNI 7323 (ISO 3506).

Mounting bracket (*)

Zinc plated carbon steel with chrome passivation;
AISI 316 L ss.

Electronic housing and covers

Low-copper content aluminum alloy with baked epoxy finish.

Covers O-ring: Buna N.

Local zero and span adjustments:

Glass filled polycarbonate plastic (removable)

Tagging

AISI 316 ss data plate attached to the electronics housing.

Calibration

- Standard: at maximum span, zero based range, ambient temperature and pressure
- Optional: at specified range and ambient conditions; or at operating temperature.

Optional extras

Mounting brackets

For vertical and horizontal 60 mm. (2 in) pipes or surface mounting.

Output indicator:

plug-in rotatable type, LCD or analog.

Standard LCD output meter scale is 0 to 100% linear; special linear scale to specified range and engineering unit is available. Standard analog output meter scale is 0 to 100% linear or 0 to 10 square-root.

Supplemental customer tag

AISI 316 ss tag fastened to the transmitter with stainless steel wire for customer's tag data up to a maximum of 56 characters and spaces on two lines for tag number and tag name, and up to a maximum of 28 characters and spaces for calibration details.

Surge protection

Environmental protection

Wet and dust-laden atmospheres

The transmitter is dust and sand tight and protected against immersion effects as defined by IEC 529 (1989) to IP 67 (IP 68 on request) or by NEMA to 4X.

Hazardous atmospheres

With or without output meter/integral display

INTRINSIC SAFETY:

- CENELEC / BASEEFA Approval;

Conformity Certificate no. Ex 94C2189

EEx ia IIC T5 (Tamb -20 to +40°C)/T4 (Tamb -20 to +85°C)

TYPE N PROTECTION:

- BS / BASEEFA Approval;

Assurance certificate no. Ex 94Y4190

Ex N IIC T5 (Tamb -20 to +40°C)/ T4 (Tamb -20 to +85°C)

CANADIAN STANDARDS ASSOCIATION

and FACTORY MUTUAL :

- Explosionproof: Class I, Div. 1, Groups A, B, C, D
- Stand ignitionproof : Class II, Div. 1, Groups E, F, G
- Suitable for : Class II, Div. 2, Groups F, G; Class III, Div. 1, 2
- Nonincendive: Class I, Div. 2, Groups A, B, C, D
- Intrinsically safe: Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G.

Electrical connections

Two 1/2 NPT or M20x1.5 or PG 13.5 or 1/2 GK threaded conduit entries, direct on housing.

Terminal block

Two terminals for signal wiring up to 2.5 mm² (14 AWG) and three connection points for test and communication purposes.

Grounding

Internal and external 6 mm² (10 AWG) ground termination points are provided.

Mounting position

Transmitter can be mounted in any position with any orientation and elevation relative to the seals for non-vacuum application provided calibration limits does not exceed URL or LRL. For vacuum applications the transmitter must be mounted below the lower remote seal (minimum value 30 cm. or 12 inches). Electronics housing may be rotated to any position. A positive stop prevents overtravel.

Mass (transmitter only without options and remote seals)

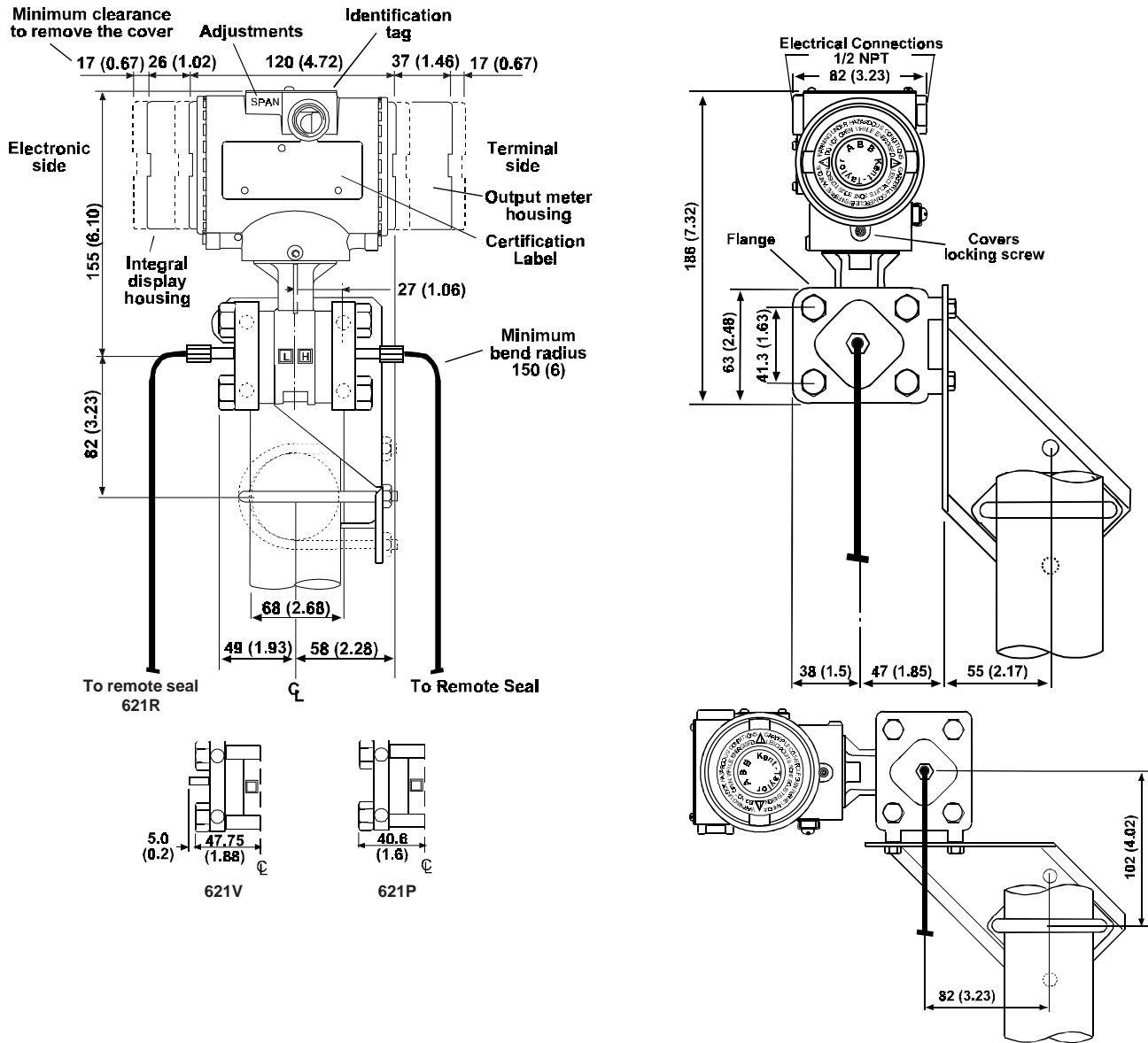
3.5 kg approx (8 lb). Add 650 g (1.5 lb) for packing.

(*) U-bolt material: AISI 400 ss; screws material: high-strength alloy steel or AISI 316 ss.

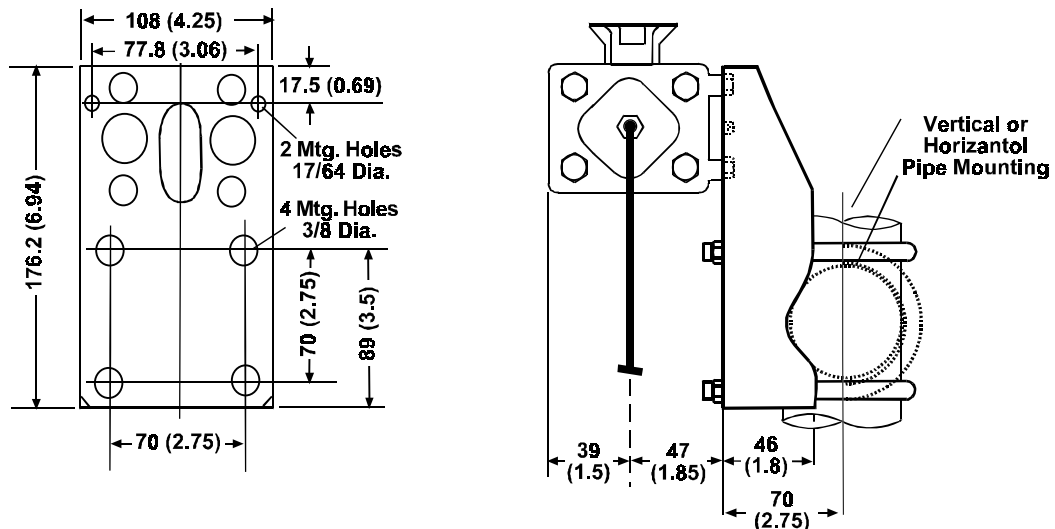
MOUNTING DIMENSIONS

(not for construction unless certified)

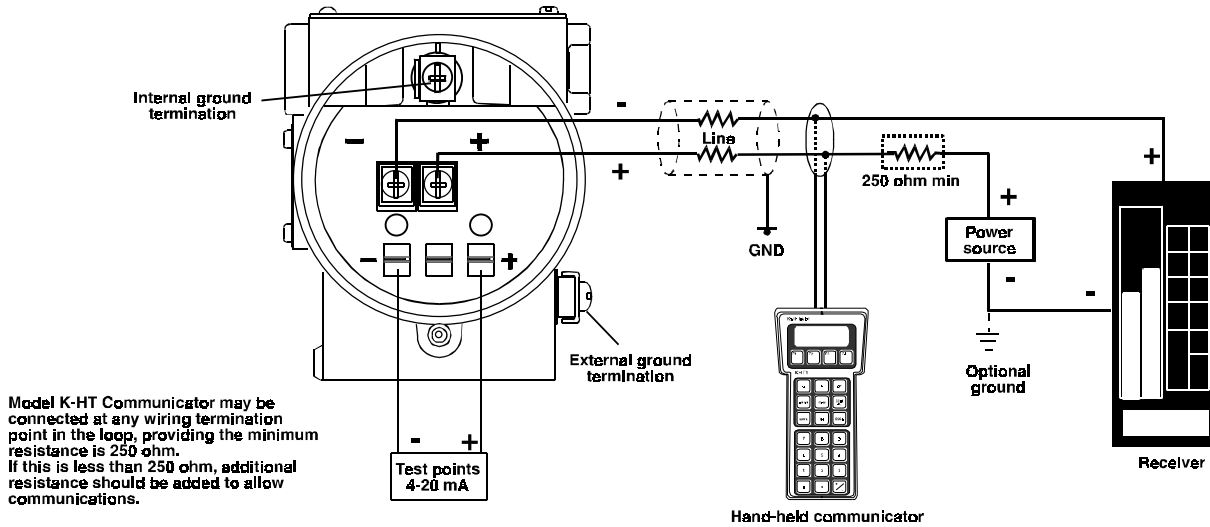
- Transmitter with welded flanges on angle bracket for vertical or horizontal 60 mm (2in) pipe mounting



- Transmitter with welded flanges on box bracket for vertical or horizontal 60 mm (2in) pipe mounting



ELECTRICAL CONNECTIONS



ORDERING INFORMATION

The transmitter and remote seal system are each identified by a separate product code number. Each code is entered on an order as a separate, consecutive, line item. On the line item for the S6, define clearly the transmitter Tag and/or item number for which the S6 is to be mounted on. These code numbers are stamped on the transmitter name plate; a typical example is as follows:

621RC200A713141 / S6W2F3020A20000

Transmitter Product Code



Seal System Product Code

The characters which comprise these code numbers identify specific product features. Refer to S6 Series section for a detailed explanation of the remote seals product code numbers.

621R series is a two sided differential pressure remote seal transmitter. It must be ordered with a S6*2... remote seal catalog number; one per transmitter (the "2" in the 4th position of the S6 catalog number defines the quantity 2 remote seals per transmitter). 621R is reserved for identical remote seal systems on the Hi and Lo pressure sides. When pricing, remember to double the total amount for the S6 portion only.

621P and 621V are, respectively, Gage and Absolute, remote seal pressure transmitters. Each must be ordered with a S6*1... remote seal catalog number; one per transmitter.

621S is a two sided differential pressure remote seal transmitter. It must be ordered with one or two S6*1... remote seal catalog number, depending on the application. 621S offers the flexibility to build:

- a single sided remote seal transmitter, with or without a 1/2in NPT reference connection on the opposite side
- a two sided differential pressure remote seal transmitter with different seals on each side.
- a direct mount level transmitter with capillary remote seal on the reference side

When placing your order remember to include all relevant information including:

Required Calibration Tag Information
Configuration Data (see last page of ordering information code number)

Please contact ABB Instrumentation or your local ABB Representative for additional information.

ORDERING INFORMATION

621R, P, V Series Smart Transmitters for Remote Seals

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

Code No.	Description			
	BASE MODEL - 1st to 4th characters			
621R	Differential pressure transmitter			(Specify one S6*2 per transmitter for remote seals)
621P	Gauge pressure transmitter			(Specify one S6*1 per transmitter for remote seal)
621V	Absolute pressure transmitter			(Specify one S6*1 per transmitter for remote seal)
	SENSOR Span limits - 5th character			
	<u>621R, P</u>		<u>621V</u>	
B	0.5 and 10 kPa	5 and 100 mbar	2 and 40.1 inH2O	not applicable to 621V
C	2 and 40 kPa	20 and 400 mbar	9 and 160 inH2O	30 and 300 mmHg
D	8 and 160 kPa	80 and 1600 mbar	32.1 and 642 inH2O	120 and 1200 mmHg
E	30 and 600 kPa	0.3 and 6 bar	4.35 and 87 psi	8.7 to 87 psi
F	120 and 2400 kPa	1.2 and 24 bar	17.4 and 348 psi	34.8 to 348 psi
H	350 and 7000 kPa	3.5 and 70 bar	50.8 and 1015 psi	101.5 to 1015 psi
U	800 and 14000 kPa	8 and 140 bar	116 and 2000 psi	200 to 2000 psi
	Diaphragm material		Fill fluid - 6th character	
2	AISI 316 L ss (NACE)		Silicone oil	
A	AISI 316 L ss (NACE)		Inert fluid	
	BOTTOM WORKS Flanges - 7th character			
	Material		Construction	
U	AISI 316 L ss (NACE)		All-Welded	
	BOLTS - 8th character			
0	Carbon Steel			
L	AISI 316 ss			
N	Zinc plated alloy steel (NACE)			
	MOUNTING BRACKET - 9th character			
	Shape		Material	
1	None		--	
7	Box type, 2" pipe		Carbon steel	
8	Box type, 2" pipe		Stainless Steel	
A	Angle type		Carbon steel	
B	Angle type		Stainless Steel	
	ELECTRICAL CERTIFICATION - 10th character (see Hazardous atmospheres specifications for details)			
1	General Purpose			
4	Intrinsic Safety to BASEEFA approval EEx ia II C T5/T4			
5	Type "N" to BS 6941:1988 BASEEFA approval Ex N II T5/T4			
8	FM & CSA Explosion Proof (Div 1), Intrinsically Safe (Div 1), Non-Incendive (Div 2)			
	TOP WORKS Electrical connection - 11th character			
1	1/2" NPT			
	ELECTRICAL OPTIONS Meter - 12th character			
1	None			
3	Digital LCD output indicator linear 0-100%, user scalable			
5	Digital LCD output indicator linear scale (specify range and engineering units)			
7	Analog output indicator linear 0-100% scale			
8	Analog output indicator square root 0-10 scale			
A	Digital LCD integral display			
C	Digital LCD integral display and digital LCD output indicator linear 4-20 mA			
E	Digital LCD integral display and analog output indicator linear 0-100% scale			

ORDERING INFORMATION (Cont'd)

621R, P, V Series Transmitters

Code No.	Description		
	SURGE PROTECTION - 13th character		
<u>1</u>	None		
<u>2</u>	Yes (Not available with ELECTRICAL CERTIFICATION code 4 or 5)		
	Configuration and engineering units	Calibration Condition	Calibration Certificate - 14th character
<u>1</u>	Std. config., Kpa, deg C	Reference	None
<u>2</u>	Std. config., Kpa, deg C	Reference	Yes (3 copies)
<u>4</u>	Std. config., in H2O/psi, deg F	Reference	None
<u>5</u>	Std. config., in H2O/psi, deg F	Reference	Yes (3 copies)
	UNUSED CHARACTER - 15th character		
<u>1</u>	Unused Character		

 (underlined code = Compliance to NACE class II bolting, according to specification MR0175, latest revision)

Boxed lines indicate most commonly ordered options.

Configuration

Standard configuration

Transmitters are factory calibrated to customer's specified range. Calibrated range and tag number are stamped on the tag plate. If a calibration range and tag data are not specified, the transmitter will be supplied with the plate left blank and configured as follows:

- * Engineering Unit: Specify code option
- * 4 mA: Zero
- * 20 mA: Upper Range Limit (URL)
- * Output: Linear
- * Damping: 1 sec.
- * Transmitter failure mode: Upscale
- * Software tag characters: Blank
- * Optional LCD output indicator: 0 to 100.0% linear

Any or all the above configurable parameters, including Lower range-value and Upper range-value which must be the same unit of measure, can be easily changed using the K-HT hand-held communicator. The transmitter database is customized with specified flange type and material, O-ring and drain/vent materials and meter code option.

Custom configuration (option)

The following data may be specified in addition to the standard configuration parameters:

- * Descriptor: 16 alphanumeric characters
- * Message: 32 alphanumeric characters
- * Date: Day, month, year
- * Damping: Seconds

Refer to configuration/certified drawing for all details and available units of measure.

ORDERING INFORMATION

621S Series Smart Single Sided Differential Pressure Remote Seal Transmitters

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

Code No. Description

621S **BASE MODEL** - 1st to 4th characters
Differential pressure transmitter

SENSOR Span limits - 5th character

C	9 and 160 inH ₂ O	2 and 40 kPa	20 and 400 mbar
D	32.1 and 642 inH ₂ O	8 and 160 kPa	80 and 1600 mbar
E	4.35 and 87 psi	30 and 600 kPa	0.3 and 6 bar
F	17.4 and 348 psi	120 and 2400 kPa	1.2 and 24 bar
H	50.8 and 1015 psi	350 and 7000 kPa	3.5 and 70 bar
U	116 and 2000 psi	800 and 14000 kPa	8 and 140 bar

Diaphragm material Fill fluid - 6th character

2	AISI 316 L ss (NACE)	Silicone oil
3	Hastelloy C-276	Silicone oil
A	AISI 316 L ss (NACE)	Inert fluid
B	Hastelloy C-276	Inert fluid

Process Connections - 7th and 8th characters

	<u>High Pressure Side</u>	<u>Low Pressure Side</u>
U5	Remote Seal (S6 Req'd)	Flange & 1/2 inch NPT adaptor, 316L ss (NACE)
UH	Remote Seal (S6 Req'd)	Flange & 1/2 inch NPT adaptor, Hastelloy C-276
UR	Remote Seal (S6 Req'd)	Direct Mount (S6E0, S6F0 or S6S0 Req'd)
UU	Remote Seal (S6 Req'd)	Remote Seal (S6 Req'd)
5U	Flange & 1/2 inch NPT adaptor, 316L ss (NACE)	Remote Seal (S6 Req'd)
HU	Flange & 1/2 inch NPT adaptor, Hastelloy C-276	Remote Seal (S6 Req'd)
BU	Blind, vented flange, 316L ss	Remote Seal (S6 Req'd)
RU	Direct Mount (S6E0, S6F0 or S6S0 Req'd)	Remote Seal (S6 Req'd)
5R	Flange & 1/2 inch NPT adaptor, 316L ss (NACE)	Direct Mount (S6E0, S6F0 or S6S0 Req'd)
HR	Flange & 1/2 inch NPT adaptor, Hastelloy C-276	Direct Mount (S6E0, S6F0 or S6S0 Req'd)
BR	Blind, vented flange, 316L ss	Direct Mount (S6E0, S6F0 or S6S0 Req'd)
R5	Direct Mount (S6E0, S6F0 or S6S0 Req'd)	Flange & 1/2 inch NPT adaptor, 316L ss (NACE)
RH	Direct Mount (S6E0, S6F0 or S6S0 Req'd)	Flange & 1/2 inch NPT adaptor, Hastelloy C-276
RB	Direct Mount (S6E0, S6F0 or S6S0 Req'd)	Blind, vented flange, 316L ss

BOLTS and GASKETS - 9th character

	Bolts	Gaskets (None when blind vented flange used)
3	Carbon Steel	PTFE
6	AISI 316 ss	PTFE
A	Zinc plated alloy steel (NACE)	PTFE
1	Carbon Steel	Viton
4	AISI 316 ss	Viton
7	Zinc plated alloy steel (NACE)	Viton

MOUNTING BRACKET - 10th character

	Shape	Material	
1	None	--	(use none when direct mount is specified)
7	Box type, 2"pipe	Carbon steel	
8	Box type, 2"pipe	Stainless Steel	
A	Angle type	Carbon steel	
B	Angle type	Stainless Steel	

ELECTRICAL CERTIFICATION - 11th character (see **Hazardous atmospheres** specifications for details)

1	General Purpose
4	Intrinsic Safety to BASEEFA approval EEx ia II C T5/T4
5	Type "N" to BS 6941:1988 BASEEFA approval Ex N II T5/T4
8	FM & CSA Explosion Proof (Div 1), Intrinsically Safe (Div 1), Non-Incendive (Div 2)

ORDERING INFORMATION (Cont'd)

621S Series Single Sided Differential Pressure Remote Seal Transmitters

Code No. Description

1 **TOP WORKS Electrical connection** - 12th character
1/2" NPT

ELECTRICAL OPTIONS Meter - 13th character

1 None

3 Digital LCD output indicator linear 0-100%, user scalable

5 Digital LCD output indicator linear scale (specify range and engineering units)

7 Analog output indicator linear 0-100% scale

8 Analog output indicator square root 0-10 scale

A Digital LCD integral display

C Digital LCD integral display and digital LCD output indicator linear 4-20 mA

E Digital LCD integral display and analog output indicator linear 0-100% scale

SURGE PROTECTION - 14th character

1 None

2 Yes (Not available with ELECTRICAL CERTIFICATION code 4 or 5)

Configuration, Ps Units, T Units - 15th character

<u>1</u>	Configuration and units	Calibration Condition	Calibration Certificate
<u>1</u>	Std. config., Kpa, deg C	Reference	None
<u>2</u>	Std. config., Kpa, deg C	Reference	Yes (3 copies)
<u>4</u>	Std. config., in H2O/psi, deg F	Reference	None
<u>5</u>	Std. config., in H2O/psi, deg F	Reference	Yes (3 copies)

__ (underlined code = Compliance to NACE class II bolting, according to specification MR0175, latest revision)

Boxed lines indicate most commonly ordered options.

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 Series pressure transmitter model 621R, 621P, 621V, and 621S specifications by providing information on the seal systems and their relevant effects on the transmitter's performance and operational limits.

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					
	Pmin (psia)	Tmin °C (°F)	Tmax at P >14 psia °C (°F)	Tmax at P min °C (°F)	Tmin °C (°F)	Tmax °C (°F)	Specific gravity @ 25°C (77°F)	Viscosity cSt @ 25°C (77°F)	Time Constant Ratio	Thermal Expansion °C (°F) •10 ⁻³
DC 200 Silicone oil	0	-40 (-40)	204 (400)	149 (300)	-40 (-40)	85 (185)	0.92	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)
Ethyl- Benzene	14.7	-73 (-100)	93 (200)	93 (200)	-40 (-40)	85 (185)	0.87	0.7	0.12	1.04 (0.58)
*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 (Fluorolube)	0.5	-18 (0)	121 (250)	66 (150)	-18 (0)	85 (185)	1.85	10	3.63	0.99 (0.55)
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)

FUNCTIONAL SPECIFICATIONS

Data are given at reference operating conditions, zero based span. Silicone oil (DC 200) fill fluid or other with thermal expansion $\sim 1 \cdot 10^{-3}$, 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:

$$\begin{aligned} \text{maximum zero suppression} + \text{calibrated span} &\leq \text{URL} \\ \text{maximum zero elevation} &\leq \text{LRL} \end{aligned}$$

*** 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 :

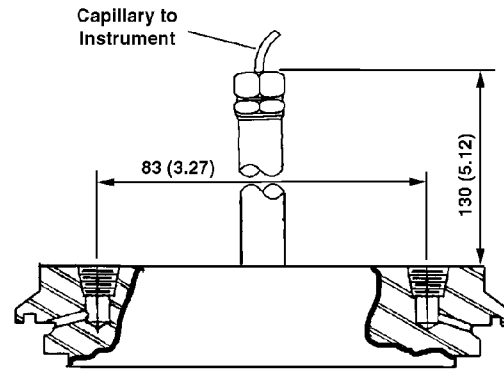
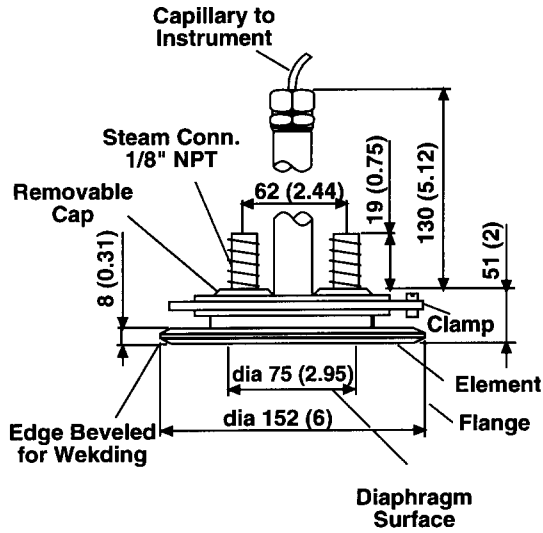
- per 50°F ambient temperature change (ETxc) for transmitter and capillary
- per 50°F process temperature change (E s) for seal(s)

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

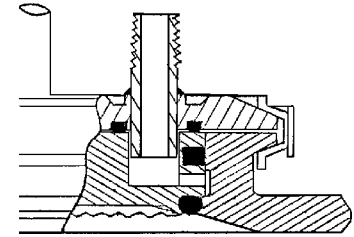
Minimum span/maximum capillary length according to relevant specification formulas.

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).

(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

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 (621P, 621V and 621S only)
2 Two Remote Seals (621R 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.

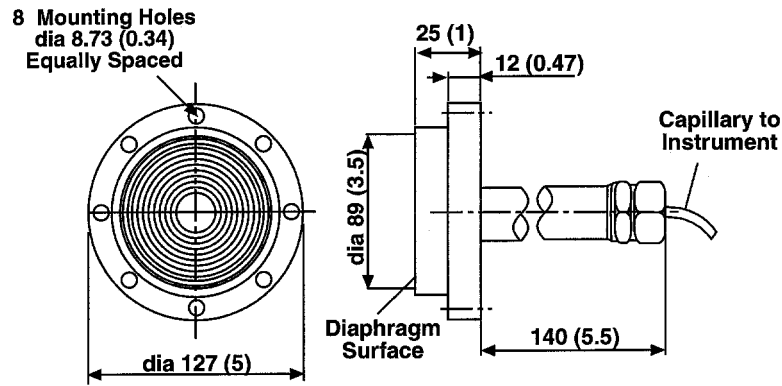
PROCESS O-RING MATERIAL - 13th character		
0	0	None
1		Buna (suitable with 6th character = 4)
2		Viton (suitable with 6th character = 4)

OPTIONS - 14th and 15th characters		
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.H2O	0.09 sec.	35ft	20 in. H2O	20 in. H2O	25 in. H2O	35 in. H2O
F6	two seals	40 in.H2O	0.18 sec.	35ft	10 in. H2O	10 in. H2O	12 in. H2O	20 in. H2O

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. H2O	0.3 in. H2O	0.5 in. H2O	0.75 in. H2O	0.4 in. H2O
F6	two seals	0.05 in. H2O	0.05 in. H2O	0.1 in. H2O	0.2 in. H2O	0.05 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

S6C MODEL CHEMICAL TEE SEAL

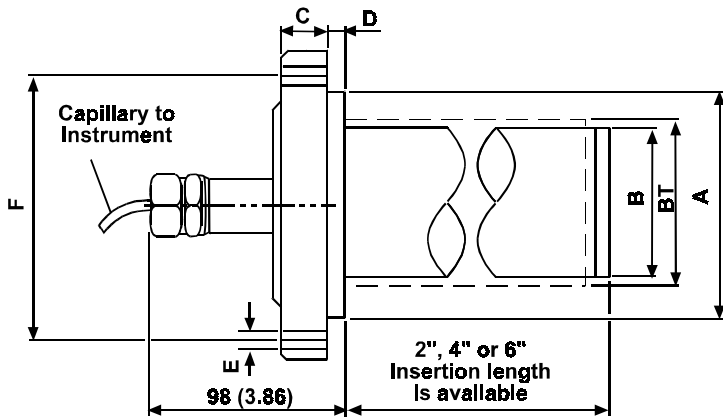
Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description
S6C	BASE NUMBER - 1st to 3rd characters Chemical Tee Remote Seal
	NUMBER OF REMOTE SEALS - 4th character
1	One Remote Seal (621P, 621V and 621S only)
2	Two Remote Seals (621R 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)
F	Ethyl Benzene
G	Glycerin/Water
P	Inert Fluid
J	Ethyl Alcohol
K	Propylene Glycol/Water
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.
	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

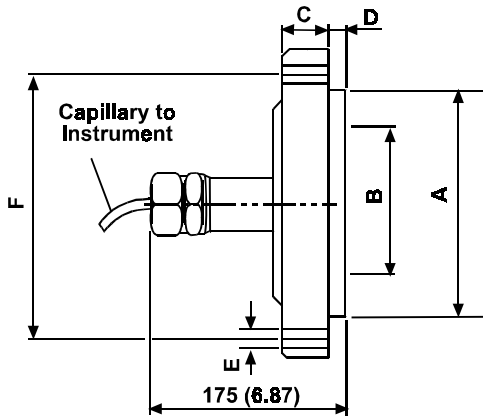
Data are given at reference operating conditions, zero based span, Silicone oil (DC 200) fill fluid, and AISI 316 L ss diaphragm seals (both seal systems at the same average temperature).

- (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.

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	
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
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	
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 Direct Mounting (only use with 621S, 7th or 8th character "R")
1 One Remote Seal (621P, 621V and 621S only)
2 Two Remote Seals (621R 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
0 Same as diaphragm

DIAPHRAGM MATERIAL - 8th character

2	2	AISI 316 L ss (NACE)	
3	3	Hastelloy C276	
5		Tantalum (max. temperature 260°C/500°F)	
7	7	AISI 316 L ss	with Teflon anti-stick coating (maximum temperature 400°F, 204°C)
8	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)
F Ethyl Benzene
G Glycerin/Water
P Inert Fluid
J Ethyl Alcohol
K Propylene Glycol/Water
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

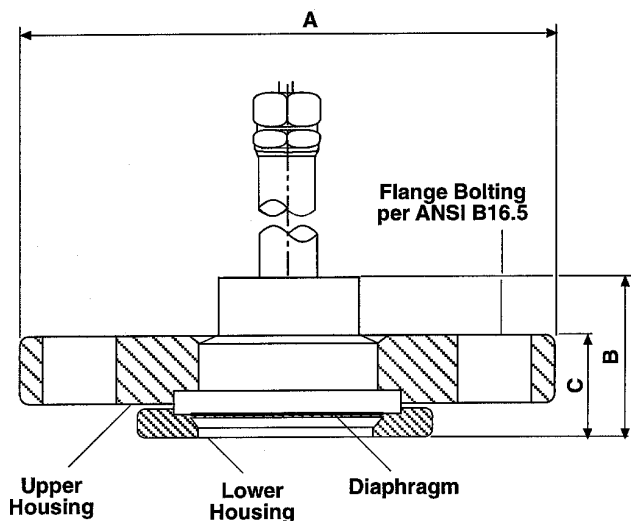
OPTIONS - 14th and 15th characters
00 None

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.

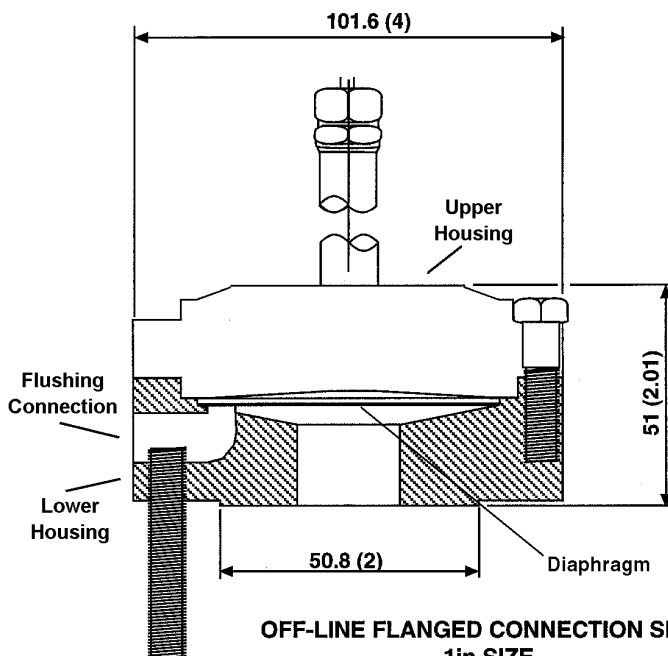
• Hastelloy is a Cabot Corporation trademark

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 ≥ 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 : 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

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

NUMBER OF REMOTE SEALS - 4th character
1 One Remote Seal (621P, 621V and 621S only)
2 Two Remote Seals (621R 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)
F Ethyl Benzene
G Glycerin/Water
P Inert Fluid
J Ethyl Alcohol
K Propylene Glycol/Water
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

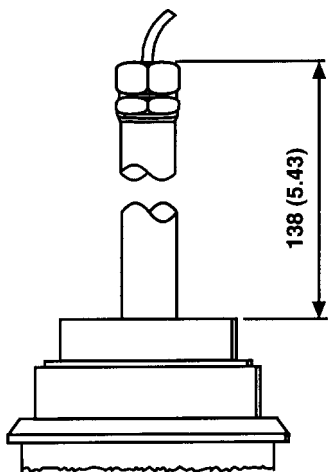
• Hastelloy is a Cabot Corporation trademark

• 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.

56S 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

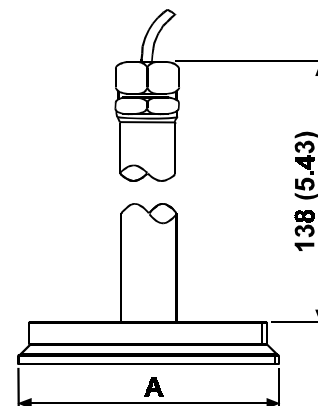
Full vacuum subject to fill fluid limits; 3in Cherry Burrell not suitable for pressure less than 7 kPa, 70 mbar, 1 psi.

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**.



TC	A
2 in.	63.5 (2-1/2)
3 in.	92.0 (3-5/8)
4 in.	119 (4-11/16)

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.

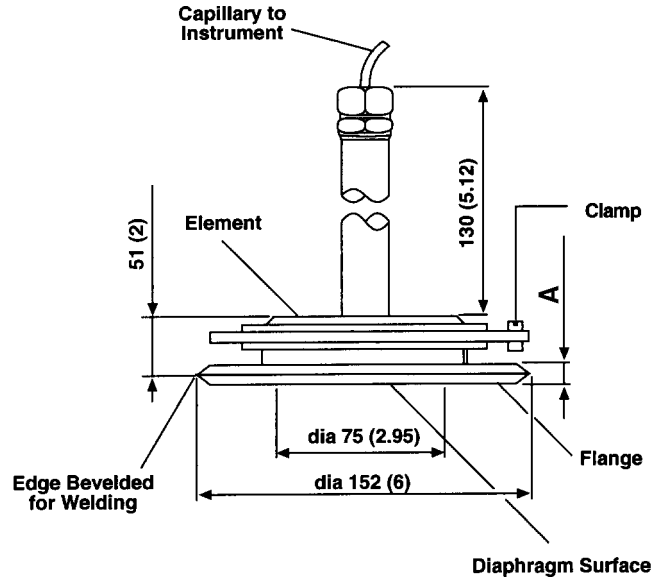
Code No.	Description
S6S	BASE NUMBER - 1st to 3rd characters Sanitary Remote Seal
	NUMBER OF REMOTE SEALS - 4th character
0	Direct Mounting (only use with 621S, 7th or 8th character "R")
1	One Remote Seal (621P, 621V and 621S only)
2	Two Remote Seals (621R only; order 1 per transmitter)
	MOUNTING CONNECTION - 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

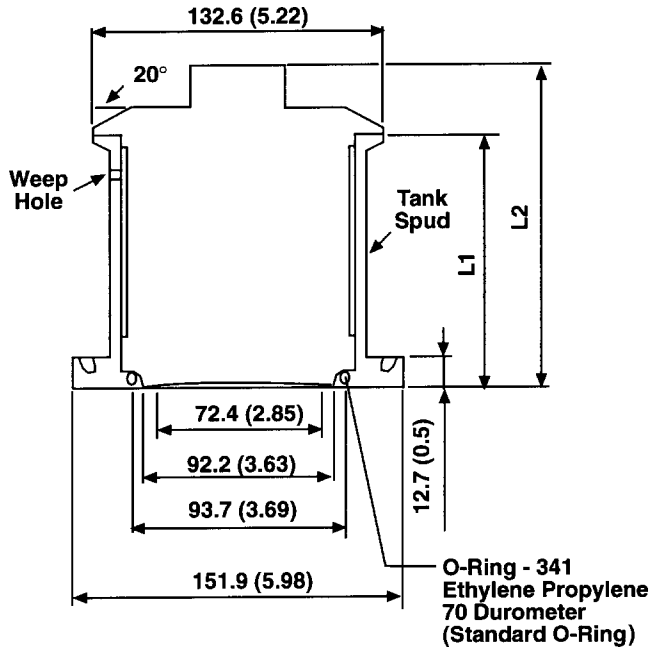
Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description
S6S	BASE NUMBER - 1st to 3rd characters Sanitary Remote Seal
	NUMBER OF REMOTE SEALS - 4th character
1	One Remote Seal (621P, 621V and 621S only)
2	Two Remote Seals (621R 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

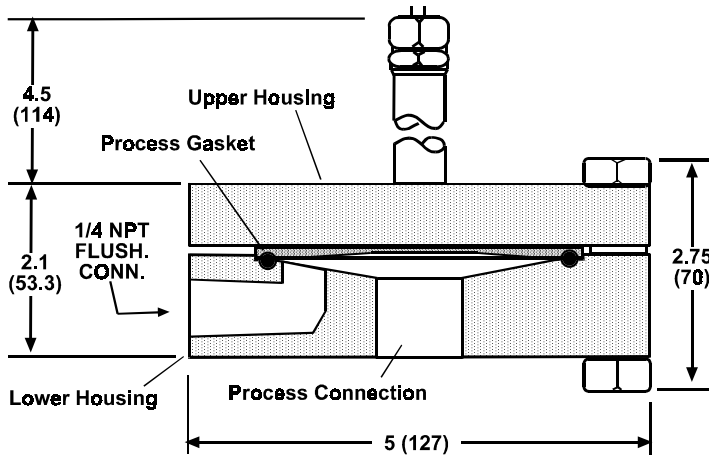
S6S_S5 SANITARY SEAL WITH EXTENDED DIAPHRAGMS

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	Direct Mounting (only use with 621S, 7th or 8th character "R")
1	One Remote Seal (621P, 621V and 621S only)
2	Two Remote Seals (621R 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



Dimensions in inches (mm)

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**.

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 (621P, 621V and 621S only)
2	Two Remote Seals (621R only; order 1 per transmitter)
	CONNECTION SIZE AND LOWER HOUSING MATERIAL (Note 1) - 5th, 6th and 7th characters
	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
	SEAL DIAPHRAGM MATERIAL - 8th character
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)
F	Ethyl Benzene
G	Glycerin/Water
P	Inert Fluid
J	Ethyl Alcohol
K	Propylene Glycol/Water
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.
	UNUSED CHARACTER - 13th character
0	Not Used
	OPTIONS - 14th and 15th characters
00	None

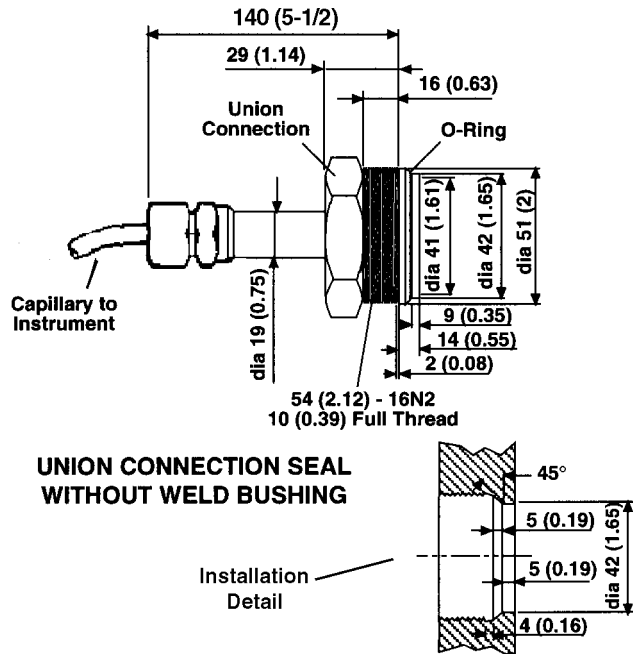
Note 1 - Upper housing material is 304 stainless steel, not process wetted

• 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).

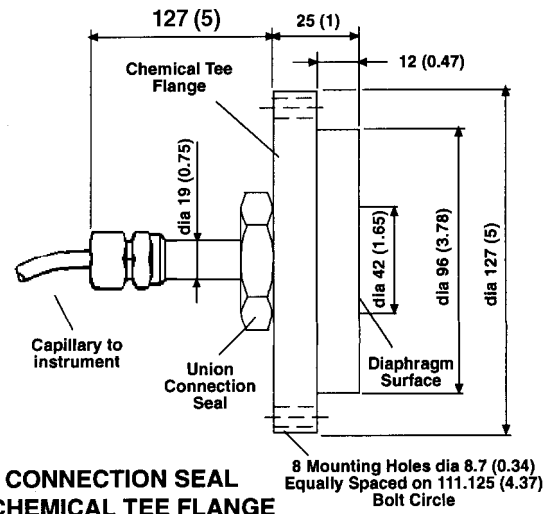
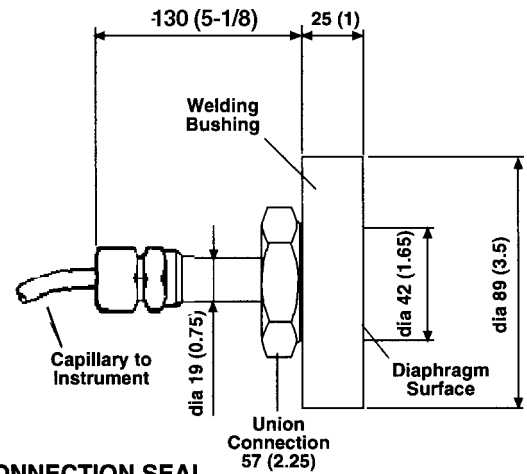


TABLE 'B'

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)

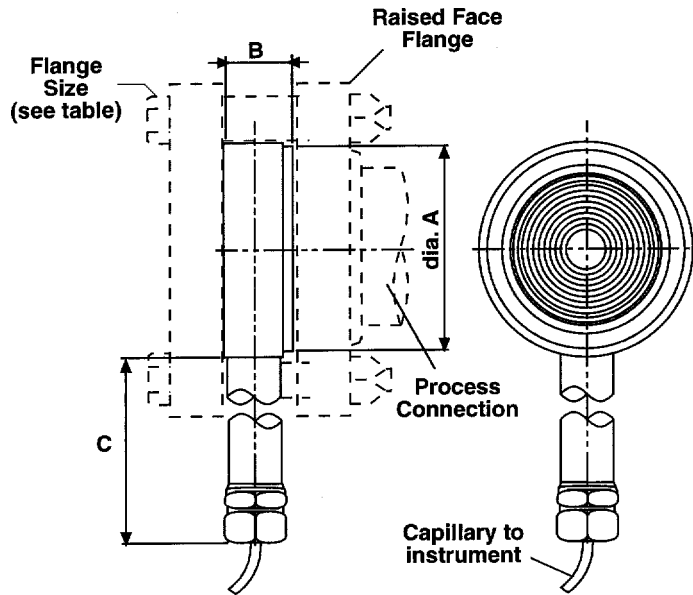
Select one character or set of characters from each category and specify complete catalog number.

Code No.	Description
S6U	BASE NUMBER - 1st to 3rd characters Threaded Union Remote Seal (621P transmitter with sensor D, E, F, or H only)
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)
F	Ethyl Benzene
G	Glycerin/Water
P	Inert Fluid
J	Ethyl Alcohol
K	Propylene Glycol/Water
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	9in 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 (621P, 621V and 621S only)
2 Two Remote Seals (621R only; order 1 per transmitter)

MOUNTING CONNECTION - 5th and 6th characters

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

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

DIAPHRAGM MATERIAL - 8th character

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

0 EXTENSION LENGTH - 9th character
None

03 to 35 CAPILLARY FILL FLUID - 10th character

A Silicone oil (DC 200)
C Silicone oil (DC 702)
D Silicone oil (DC 704)
F Ethyl Benzene
G Glycerin/Water
P Inert Fluid
J Ethyl Alcohol
K Propylene Glycol/Water
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

OPTIONS - 14th and 15th characters

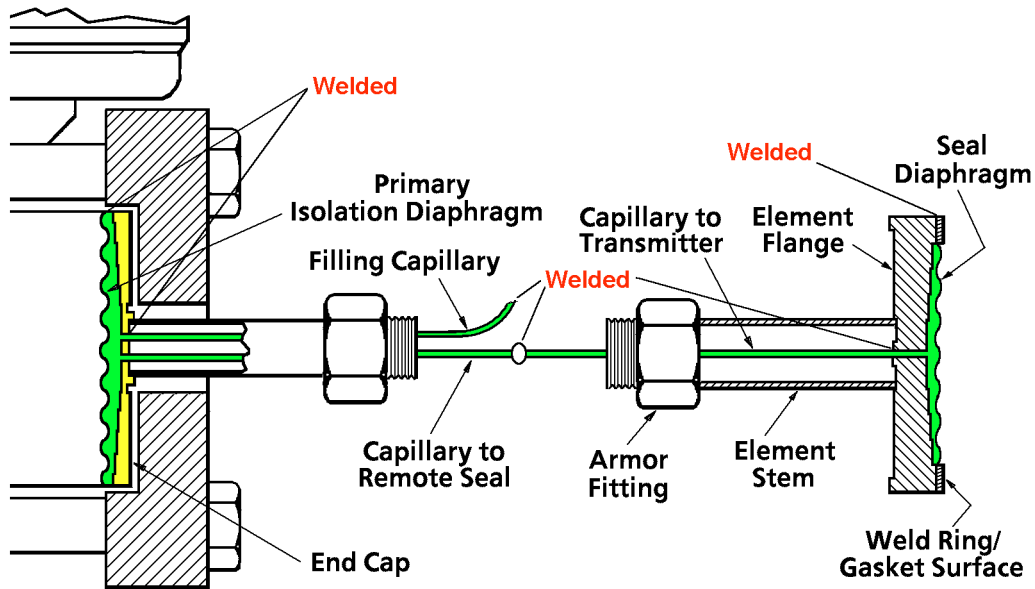
00	00	None
K1		1-1/2" ANSI CL150 Carbon Steel Flange
L1		1-1/2" ANSI CL300 Carbon Steel Flange
P1		1-1/2" ANSI CL1500 Carbon Steel Flange
	K3	3" ANSI CL150 Carbon Steel Flange
	L3	3" ANSI CL300 Carbon Steel Flange
	S3	3" ANSI CL150 316 SST Flange
	T3	3" ANSI CL300 316 SST Flange

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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SS-621RPV 98.7

ABB Kent-Taylor Ltd.
St. Neots Cambs.
England, PE19 3EU
Tel: (01480) 475321
Fax: (01480) 217948

ABB Instrumentation Inc.
P.O. Box 20550
Rochester, New York 14602-0550
Tel: (716) 292-6050
Fax: (716) 273-6207

ABB Kent-Taylor SpA
22016 Lenno
Como, Italy
Tel: (0344) 58111
Fax: (0344) 56278