Honeywell

ST 3000 Smart Transmitter

Series 900 Remote Diaphragm Seals Models

STR93D	0 to 100 psid	0 to 7 bar
STR94G	0 to 500 psig	0 to 35 bar

34-ST-03-57
7/04

Specification and Model Selection Guide

Introduction

In 1983, Honeywell introduced the first Smart Pressure Transmitter— the ST 3000®. In 1989, Honeywell launched the first all digital, bi-directional protocol for smart field devices. Today, its ST 3000 Series 900 Remote Seal Transmitters continue to bring proven "smart" technology to a wide spectrum of pressure measurement applications. For applications in which the transmitter must be mounted remotely from the process, Honeywell offers the remote seal line of gauge, absolute and differential pressure transmitters. Typical applications include level measurement in pressurized vessels in the chemical and hydrocarbon processing industries. A second application is flow measurement for slurries and high viscosity fluids in the chemical industry. Honeywell remote seal transmitters are available with secondary fill fluids for corrosive or high temperature process fluids

All ST 3000 transmitters can provide a 4-20 mA output, Honeywell Digitally Enhanced (DE) output, HART* output, or FOUNDATION™ Fieldbus output. When digitally integrated with Honeywell's Process Knowledge System™, EXPERION PKS™, ST 3000 instruments provide a more accurate process variable as well as advanced diagnostics.

Honeywell's cost-effective ST 3000 S900 transmitters lead the industry in reliability and stability:

- Stability = +/-0.01% per year
- Reliability = 470 years MTBF

Figure 1—Series 900 Remote Seal Pressure Transmitters feature proven piezoresistive sensor technology.

The devices provide comprehensive self-diagnostics to help users maintain high uptime, meet regulatory requirements, and attain high quality standards. S900 transmitters allow smart performance at analog prices. Accurate, reliable and stable, Series 900 transmitters offer greater turndown ratio than conventional transmitters.

"Honeywell transmitters operating in the digital mode using Honeywell's Digitally Enhanced (DE) protocol make diagnostics available right at the control system's human interface. Equally important, transmitter status information is continuously displayed to alert the operator immediately of a fault condition. Because the process variable (PV) status transmission precedes the PV value, we are guaranteed that a bad PV is not used in a control algorithm. In addition, bi-directional communication provides for remote transmitter configuration directly from the human interface, enabling management of the complete loop."

Maureen Atchison, DuPont
Site Electrical & Instrumentation Leader

Description

The ST 3000 transmitter can replace any 4 to 20 mA output transmitter in use today and operates over a standard two-wire system.

The measuring means is a piezoresistive sensor, which actually contains three sensors in one. It contains a differential pressure sensor, a temperature sensor, and a static pressure sensor.

Microprocessor-based electronics provide higher span-turndown ratio, improved temperature and pressure compensation, and improved accuracy.

The transmitter's meter body and electronics housing resist shock, vibration, corrosion, and moisture. The electronics housing contains a compartment for the single-board electronics, which is isolated from an integral junction box. The single-board electronics is replaceable and interchangeable with any other ST 3000 Series 100 or Series 900 model transmitter.

Like other Honeywell transmitters, the ST 3000 features two-way communication between the operator and the transmitter through our Smart Field Configurator (SFC). You can connect the SFC anywhere that you can access the transmitter signal lines.

The SCT 3000 Smartline® Configuration Toolkit provides an easy way to configure instruments using a personal computer. The toolkit enables configuration of devices before shipping or installation. The SCT 3000 can operate in the offline mode to configure an unlimited number of devices. The database can then be loaded downline during commissioning.

Features

- Choice of linear or square root output conformity is a simple configuration selection.
- Direct digital integration with Experion PKS and other control systems provides local measurement accuracy to the system level without adding typical A/D and D/A converter inaccuracies.
- Unique piezoresistive sensor automatically compensates input for temperature and static pressure.Added "smart" features include configuring lower and upper range values, simulating accurate analog output, and selecting preprogrammed engineering units for display.
- Smart transmitter capabilities with local or remote interfacing means significant manpower efficiency improvements in commissioning, start-up, and ongoing maintenance functions.

Specifications

Operating Conditions – All Models

Parameter	Reference Condition (at zero static)		Rated Condition		Operative Limits		Transportation and Storage	
	°C	°F	°C	°F	°C	°F	°C	°F
Ambient Temperature	25 ±1	77 ±2	-25 to 70	-13 to 158	-40 to 85	-40 to 185	-55 to 125	-67 to 257
Process Interface Temperature	25 ±1	77 ±2	See Figure 2				-55 to 125	-67 to 257
Humidity %RH	10 to 55		0 to 100		0 to 100		0 to 100	
Maximum Allowable Working Pressure (MAWP)	MAWP is minimum of Body Rating or Seal Rating (See Model Selection Guide for Seal MAWP) Body MAWP STR93D 750 psig (52 bar) STR94G 500 psig (35 bar)							
Vacuum Region, Minimum Pressure - mmHg absolute	atmospheric		See Figure 2					
inH$_2$O absolute	atmospheric							
Supply Voltage, Current, and Load Resistance	**Voltage Range:** 10.8 to 42.4 Vdc at terminals **Current Range:** 3.0 to 21.8 mA **Load Resistance:** 0 to 1440 ohms (as shown in Figure 3)							

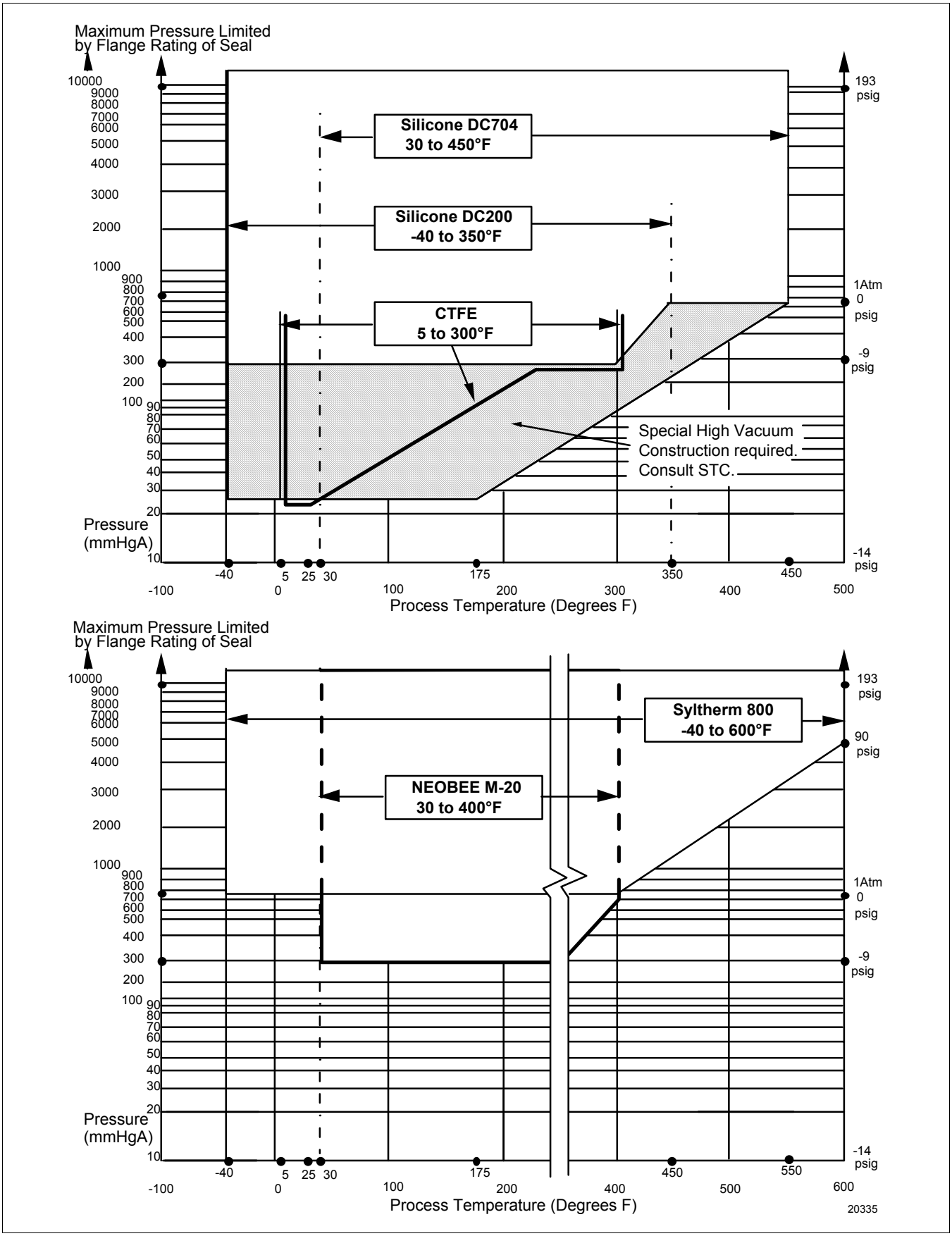


Figure 2—ST 3000 Remote Seals operable limits for pressure versus temperature

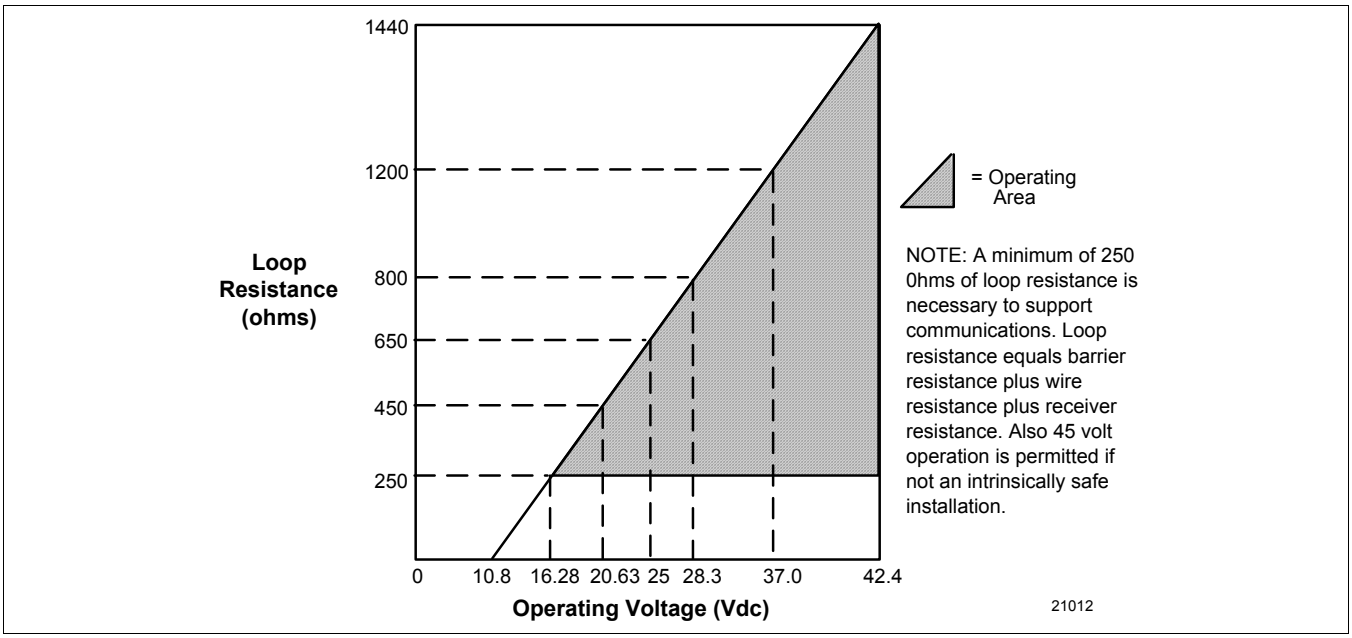


Figure 3—Supply voltage and loop resistance chart

Performance Under Rated Conditions * - Model STR93D (0 to 100 psi/7 bar)

Parameter	Description
Upper Range Limit **psi** **bar**	100 (Transmitter URL or maximum seal pressure rating, whichever is lower.) 7
Minimum Span **psi** **bar**	0.9 0.063
Turndown Ratio	110 to 1
Zero Elevation and Suppression	No limit except minimum span within ±100% URL.
Accuracy (Reference – Includes combined effects of linearity, hysteresis, and repeatability) • *Accuracy includes residual error after averaging successive readings.* • *For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.*	**In Analog Mode:** ±0.20% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (50 inH_2O), accuracy equals: $\pm 0.10 + 0.10 \left(\frac{50\ \text{in}H_2O}{\text{span in}H_2O} \right)$ or $\pm 0.10 + 0.10 \left(\frac{125\ \text{mbar}}{\text{span mbar}} \right)$ in % span **In Digital Mode:** ±0.175% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (50 inH_2O), accuracy equals: $\pm 0.075 + 0.10 \left(\frac{50\ \text{in}H_2O}{\text{span in}H_2O} \right)$ or $\pm 0.075 + 0.10 \left(\frac{125\ \text{mbar}}{\text{span mbar}} \right)$ in % span
Combined Zero and Span Temperature Effect per 28°C (50°F) ** • *Specification doubles for 2-inch Sanitary Seals or for model with only one remote seal*	**In Analog Mode:** ±1.5% of span. For URV below reference point (100 inH_2O), effect equals: $\pm 0.30 + 1.2 \left(\frac{100\ \text{in}H_2O}{\text{span in}H_2O} \right)$ or $\pm 0.30 + 1.2 \left(\frac{250\ \text{mbar}}{\text{span mbar}} \right)$ in % span **In Digital Mode:** ±1.475% of span. For URV below reference point (100 inH_2O), effect equals: $\pm 0.275 + 1.2 \left(\frac{100\ \text{in}H_2O}{\text{span in}H_2O} \right)$ or $\pm 0.275 + 1.2 \left(\frac{250\ \text{mbar}}{\text{span mbar}} \right)$ in % span

* Performance specifications are based on reference conditions of 25°C (77°F), zero (0) static pressure, 10 to 55% RH, and 316L Stainless Steel barrier diaphragm.

** Apply 1.5 times factor to capillary lengths greater than 10 feet.

Performance Under Rated Conditions * - Models STR94G (0 to 500 psi/35 bar)

Parameter	Description
Upper Range Limit **psi** **bar**	500 35
Minimum Span **psi** **bar**	20 1.4
Turndown Ratio	25 to 1
Zero Elevation and Suppression	No limit except minimum span from absolute 0 (zero) to +100% URL.
Accuracy (Reference – Includes combined effects of linearity, hysteresis, and repeatability) • *Accuracy includes residual error after averaging successive readings.* • *For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.*	**In Analog Mode:** ±0.10% of calibrated span or upper range value (URV), whichever is greater, terminal based. **In Digital Mode:** ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based.
Combined Zero and Span Temperature Effect per 28°C (50°F) **	**In Analog Mode:** ±2.2% of span. For URV below reference point (50 psi), effect equals: $\pm 0.2 + 2.0 \left(\frac{50 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.2 + 2.0 \left(\frac{3.5 \text{ bar}}{\text{span bar}}\right)$ in % span **In Digital Mode:** ±2.175% of span For URV below reference point (50 psi), effect equals: $\pm 0.175 + 2.0 \left(\frac{50 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.175 + 2.0 \left(\frac{3.5 \text{ bar}}{\text{span bar}}\right)$ in % span

* Performance specifications are based on reference conditions of 25°C (77°F), zero (0) static pressure, 10 to 55% RH, and 316L Stainless Steel barrier diaphragm.

** Apply 1.5 times factor to capillary lengths greater than 10 feet.

Performance Under Rated Conditions - General for all Models

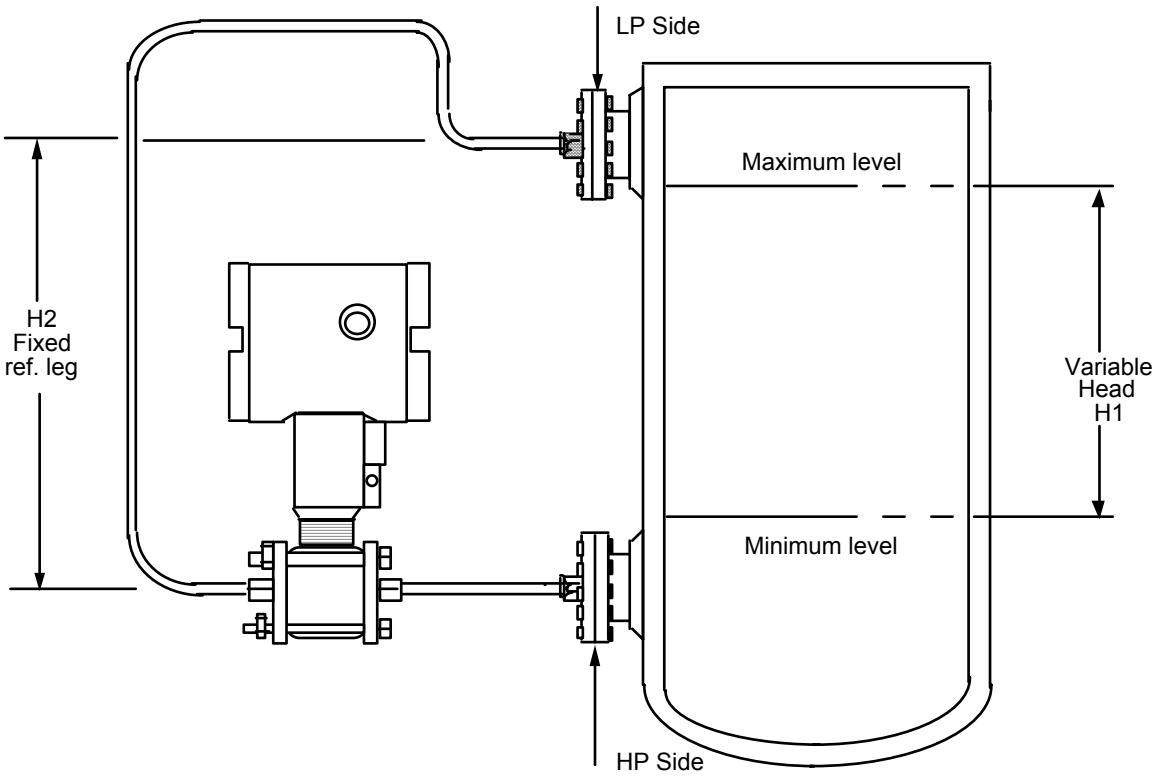
Parameter	Description
Output (two-wire)	Analog 4 to 20 mA or DE digital communications mode. Options available for FOUNDATION Fieldbus and HART protocols.
Supply Voltage Effect	0.005% span per volt.
Damping Time Constant	Adjustable from 0 to 32 seconds digital damping.
CE Conformity (Europe)	89/336/EEC, Electromagnetic Compatibility (EMC) Directive.

Physical and Approval Bodies

Parameter	Description
Process Interface	See Model Selection Guide for Material Options for desired Seal Type.
Seal Barrier Diaphragm	316L Stainless Steel, Monel, Hastelloy C, Tantalum
Seal Gasket Materials	Klinger C-4401 (non-asbestos) Grafoil
Mounting Bracket	Carbon Steel (zinc-plated) or Stainless Steel angle bracket or Carbon Steel flat bracket available.
Fill Fluid (Meter Body)	Silicone (DC 200) S.G. @ 25°C (77°F) = 0.94 CTFE (Chlorotrifluoroethylene) S.G. @ 25°C (77°F) = 1.89
Fill Fluid (Secondary)*	Silicone (DC 200) S.G. @ 25°C (77°F) = 0.94 CTFE (Chlorotrifluoroethylene) S.G. @ 25°C (77°F) = 1.89 Silicone (DC 704) S.G. @ 25°C (77°F) = 1.07 Syltherm 800 S.G. @ 25°C (77°F) = 0.90 NEOBEE M-20 S.G. @ 25°C (77°F) = 0.93
Electronics Housing	Epoxy-Polyester hybrid paint. Low-copper aluminum alloy. Meets NEMA 4X (watertight) and NEMA 7 (explosion proof)
Capillary Tubing**	Armored Stainless Steel or PVC Coated Armored Stainless Steel. Length: 5, 10, 15, 20, 25 and 35 feet (1.5, 3, 4.6, 6.1, 7.5 and 10.7m). A 2" (51 millimeter) S.S. close-coupled nipple is also available. See Model Selection Guide.
Wiring	Accepts up to 16 AWG (1.5 mm diameter)
Mounting	See Figure 4.
Dimensions	See Figures 7 and 8 for transmitter dimensions. See Model Selection Guide for Seal dimensions
Net Weight	Transmitter: 4.1 Kg (9 lbs). Total weight is dependent on seal type and capillary length.
Approval Bodies - **Hazardous Areas** - **Canadian Registration Number (CRN)**	Approved as explosion proof and intrinsically safe for use in Class I, Division 1, Groups A, B, C, D locations, and nonincendive for Class I, Division 2, Groups A, B, C, D locations. Approved EEx ia IIC T4, T5, T6 and EEx d IIC T5, T6 per ATEX standards. See attached Model Selection Guide for options. - All ST 3000 model designs, except STG19L, STG99L, STG170, STG180, have been registered in all provinces and territories in Canada and are marked CRN: 0F8914.5C.
Pressure Equipment Directive (97/23/EC)	The ST 3000 pressure transmitters listed in this Specification have no pressurized internal volume or have a pressurized internal volume rated less than 1,000 bar (14,500 psig) and/or have a maximum volume of less than 0.1 liter. Therefore, these transmitters are either; not subject to the essential requirements of the directive 97/23/EC (PED, Annex 1) and shall not have the CE mark, or the manufacturer has the free choice of a module when the CE mark is required for pressures > 200 bar (2,900 psig).

* See Figure 2 for Fill Fluid temperature limits.
** 2-inch Sanitary Seals are limited to 15 ft. (4.6 m) capillary length.

NOTE: Pressure transmitters that are part of safety equipment for the protection of piping (systems) or vessel(s) from exceeding allowable pressure limits, (equipment with safety functions in accordance with Pressure Equipment Directive 97/23/EC article 1, 2.1.3), require separate examination.



NOTE: Lower flange seal should not be mounted over 22 feet below the transmitter for silicone fill fluid (11 feet for CTFE fill fluid) with tank at one atmosphere. The combination of tank vacuum and high pressure capillary head effect should not exceed 9 psi vacuum (300 mmHg absolute).

Consult Honeywell for installation of STR93D

Figure 4—Typical mounting arrangement for ST 3000 Transmitter with Remote Diaphragm Seals

Application Data

Liquid Level: Closed Tank
Determine the minimum and maximum pressure differentials to be measured (Figure 5).

$P_{Min} = (SG_p \times a) - (SG_f \times d)$
= LRV when HP at bottom of tank
= –URV when LP at bottom of tank

$P_{Max} = (SG_p \times b) - (SG_f \times d)$
= URV when HP at bottom of tank
= –LRV when LP at bottom of tank

Where:

minimum level = 4mA

maximum level = 20 mA

a = distance between bottom tap and minimum level

b = distance between bottom tap and maximum level

d = distance between taps

SG_f = Specific Gravity of capillary fill fluid (See Page 6 for values.)

SG_p = Specific Gravity of process fluid

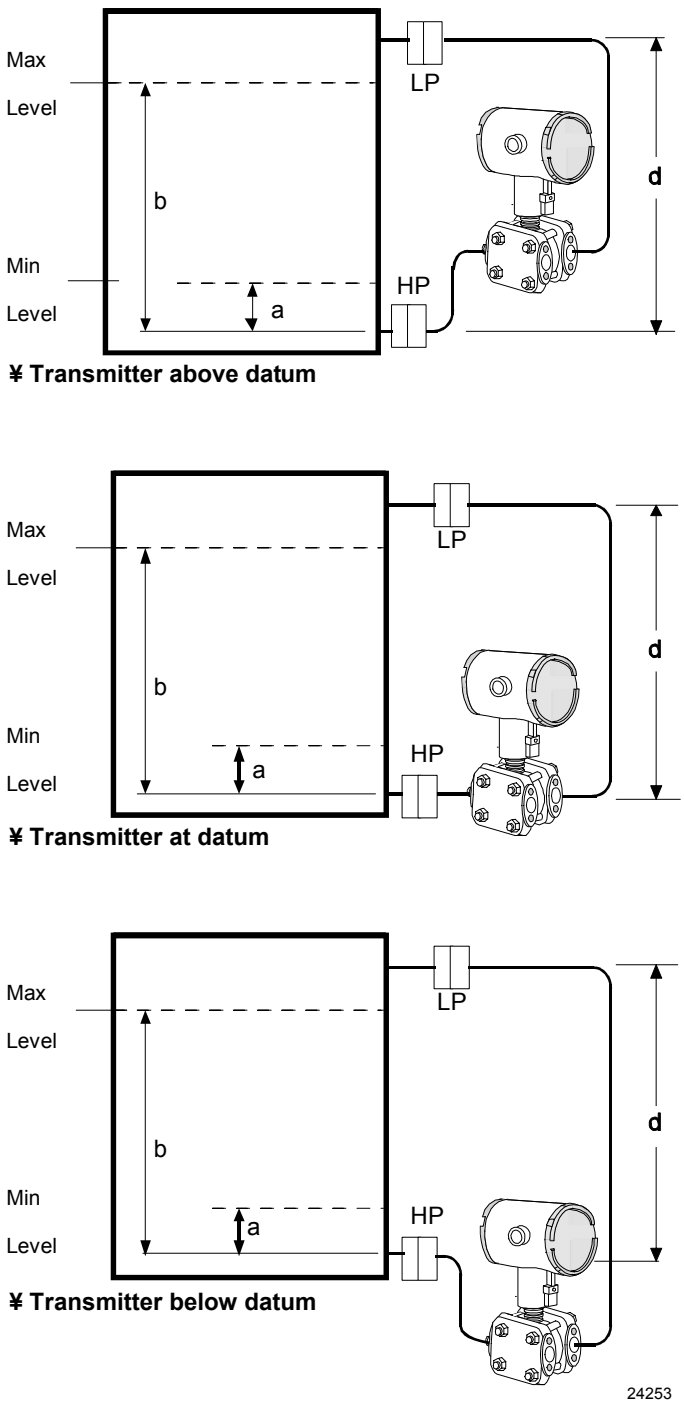


Figure 5—Closed tank liquid level measurement distances

Density or Interface
Calculate the minimum and maximum pressure differentials to be measured (Figure 6).

P_{min} = (SG_{min} – SG_f) x (d); minimum density, 4mA output

P_{max} = (SG_{max} – SG_f) x (d); maximum density, 20mA output

Where:

d = distance between the taps

SG_{max} = maximum Specific Gravity

SG_{min} = minimum Specific Gravity

SG_f = Specific Gravity of capillary fill fluid (See Page 6 for values.)

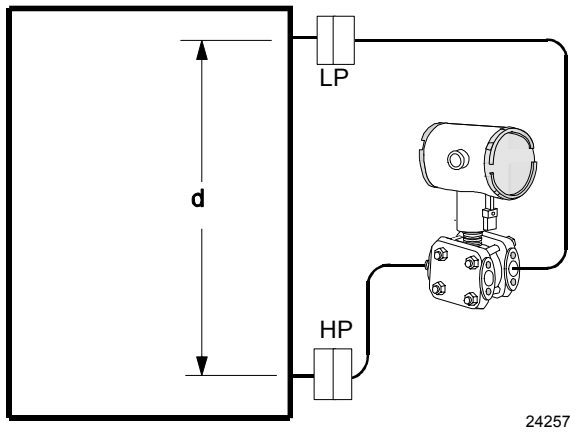
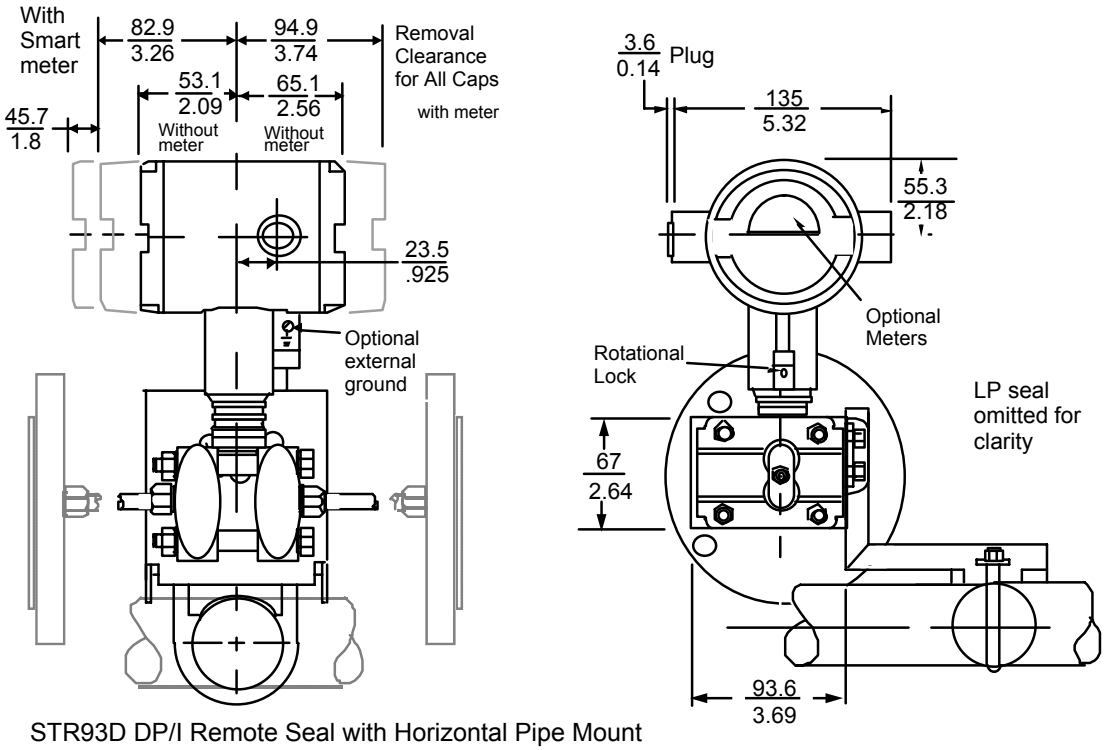
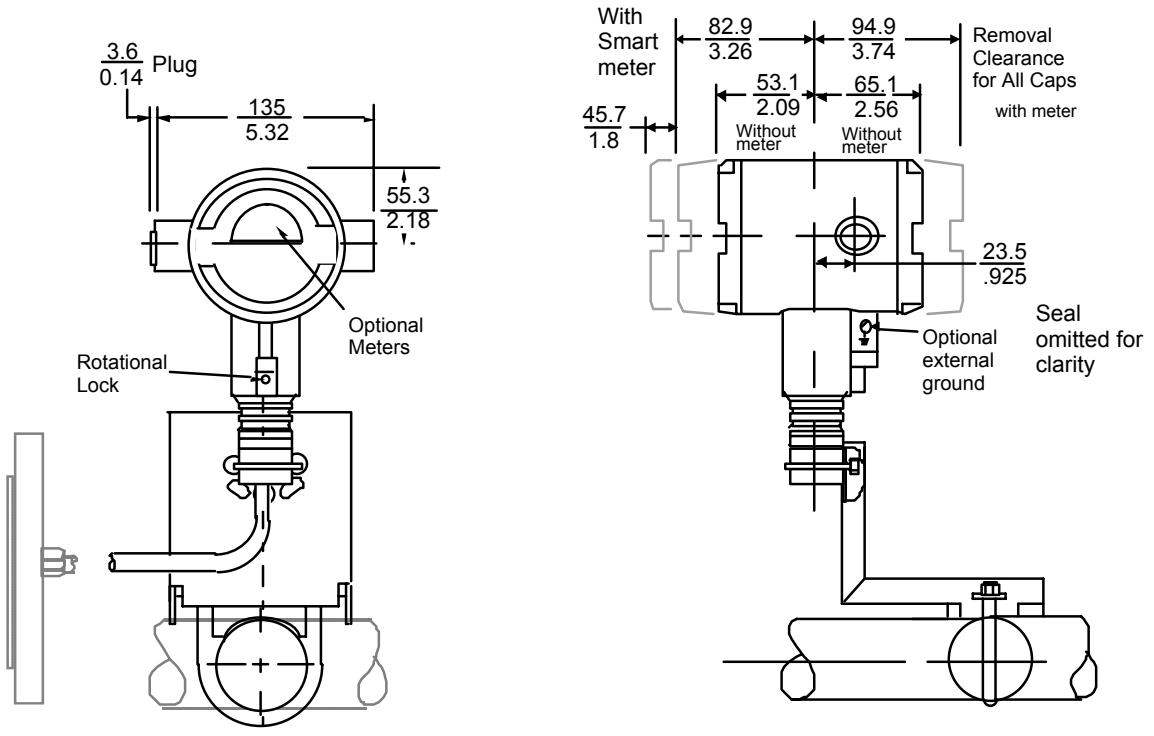


Figure 6—Density, direct acting transmitter configuration

Reference Dimensions: millimeters
Inches



STR93D DP/I Remote Seal with Horizontal Pipe Mount

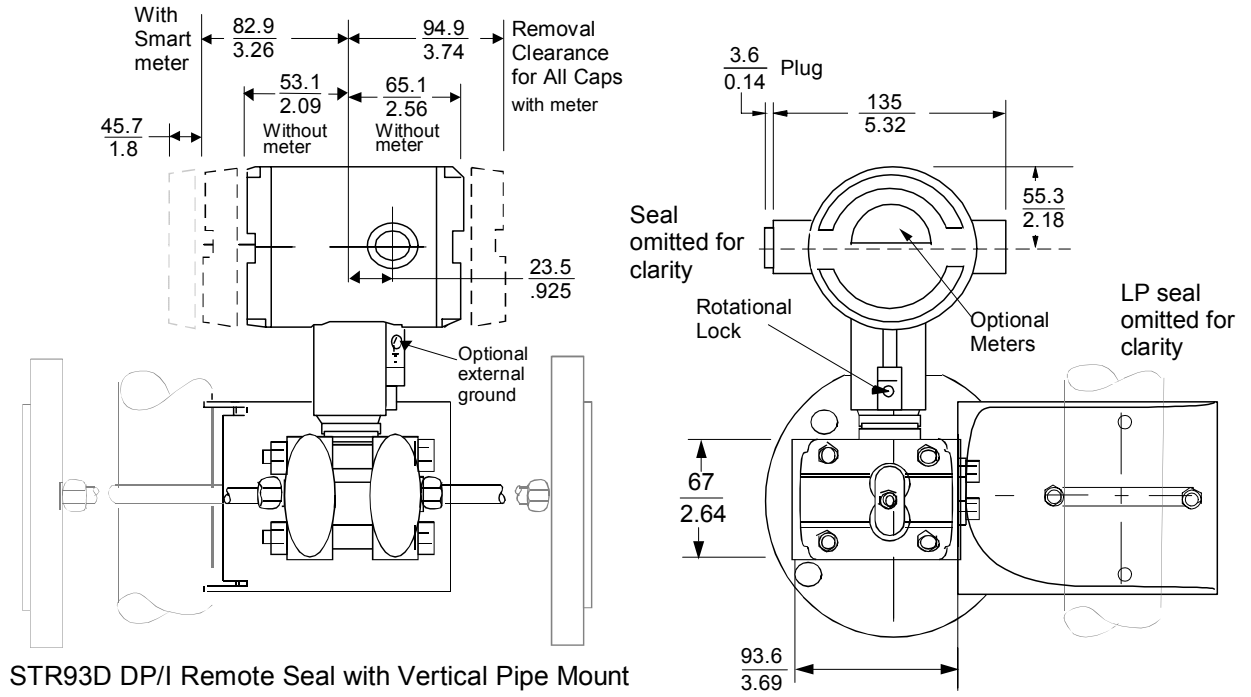


STR94G LGP/I Remote Seal with Horizontal Pipe Mount

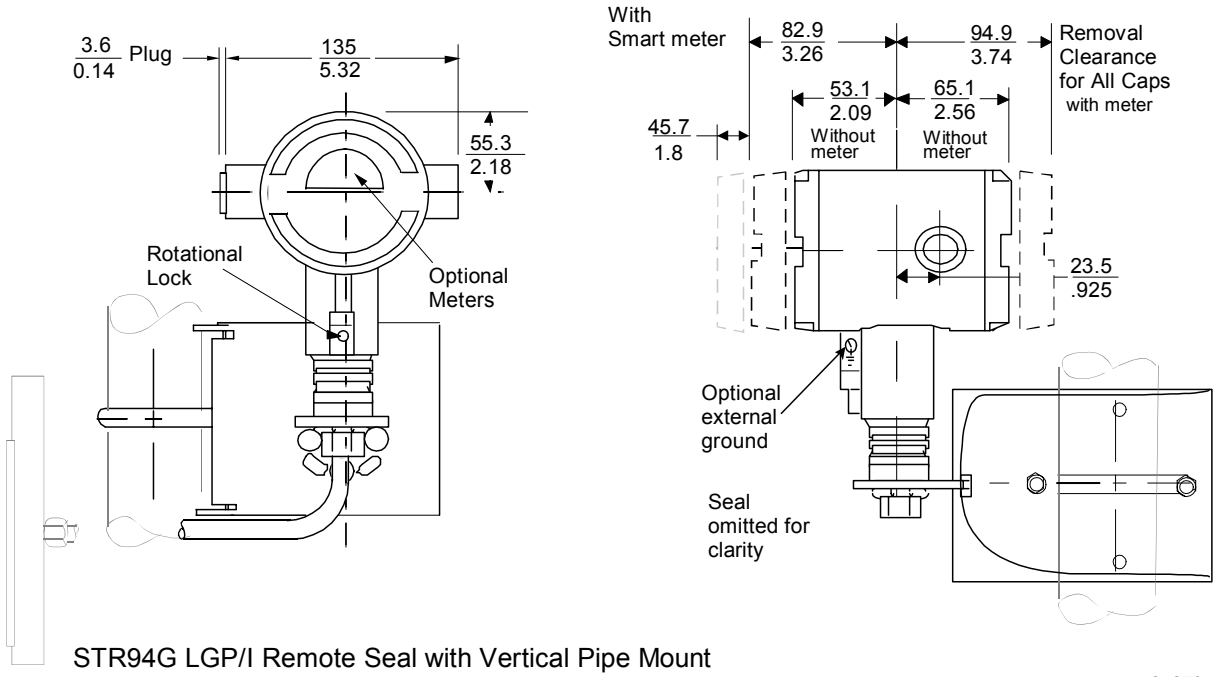
24272

Figure 7—Approximate horizontal mounting dimensions for Remote Seal Transmitter.

Reference Dimensions: millimeters
Inches



STR93D DP/I Remote Seal with Vertical Pipe Mount



STR94G LGP/I Remote Seal with Vertical Pipe Mount

24273

Figure 8—Approximate vertical mounting dimensions for Remote Seal Transmitter

Options

Mounting Bracket
The angle mounting bracket is available in either zinc-plated carbon steel or stainless steel and is suitable for horizontal or vertical mounting on a two inch (50 millimeter) pipe, as well as wall mounting. An optional flat mounting bracket is also available in carbon steel for two inch (50 millimeter) pipe mounting.

Indicating Meter (ME and SM Options)
Two integral meter options are available. An analog meter (option ME) is available with a 0 to 100% linear scale. The Smart Meter (option SM) provides an LCD display for both analog and digital output and can be configured to display pressure in pre-selected engineering units.

Lightning Protection (Option LP)
A terminal block with circuitry that protects the transmitter from transient surges induced by nearby lightning strikes is available.

HART Protocol Compatibility (Option HC)
An optional electronics module is available for the ST 3000 that provides HART Protocol compatibility. Transmitters with the HART Option are compatible with the AMS System. (Contact your AMS Supplier if an upgrade is required.)

Indicator Configuration (Option CI)
Provides custom configuration of Smart Meters.

Tagging (Option TG)
Up to 30 characters can be added on the stainless steel nameplate mounted on the transmitter's electronics housing at no extra cost. Note that a separate nameplate on the meter body contains the serial number and body-related data. A stainless steel wired on tag with additional data of up to 4 lines of 28 characters is also available. The number of characters for tagging includes spaces.

Transmitter Configuration (Option TC)
The factory can configure the transmitter linear/square root extraction, damping time, LRV, URV and mode (analog/digital) and enter an ID tag of up to eight characters and scratchpad information as specified.

Custom Calibration and ID in Memory (Option CC)
The factory can calibrate any range within the scope of the transmitter's range and enter an ID tag of up to eight characters in the transmitter's memory.

FOUNDATION Fieldbus (Option FF)
Equips transmitter with FF protocol for use in 31.25 kbit/s FF networks. See document 34-ST-03-72 for additional information on ST 3000 Fieldbus transmitters.

Specifications are subject to change without notice.
(Note that specifications may differ slightly for transmitters manufactured before October 30, 1995.)

Ordering Information

Contact your nearest Honeywell sales office, or

In the U.S.:
Honeywell
Industrial Automation & Control
16404 North Black Canyon Hwy.
Phoenix, AZ 85053
1-800-288-7491

In Canada:
The Honeywell Centre
155 Gordon Baker Rd.
North York, Ontario M2H 3N7
1-800-461-0013

In Latin America:
Honeywell Inc.
480 Sawgrass Corporate Parkway,
Suite 200
Sunrise, FL 33325
(954) 845-2600

In Europe and Africa:
Honeywell S. A.
Avenue du Bourget 1
1140 Brussels, Belgium

In Eastern Europe:
Honeywell Praha,
s.r.o. Budejovicka 1
140 21 Prague 4,
Czech Republic

In the Middle East:
Honeywell Middle East Ltd.
Khalifa Street,
Sheikh Faisal Building
Abu Dhabi, U. A. E.

In Asia:
Honeywell Asia Pacific Inc.
Honeywell Building,
17 Changi Business Park Central 1
Singapore 486073
Republic of Singapore

In the Pacific:
Honeywell Pty Ltd.
5 Thomas Holt Drive
North Ryde NSW Australia 2113
(61 2) 9353 7000

In Japan:
Honeywell K.K.
14-6 Shibaura 1-chrome
Minato-ku, Tokyo, Japan 105-0023

Or, visit Honeywell on the World Wide Web at: **http://www.honeywell.com**

34-ST-16-34 Issue 21

Instructions

- Select the desired Key Number. The arrow to the right marks the selection available.
- Make one selection from each table, I and II, using the column below the proper arrow.

Select as many Table III options as desired (if no options or approvals are desired, specify 9X).
A (◆) denotes unrestricted availability. A letter denotes restricted availability.
Restrictions follow Table IV.

Key Number		I		II		III (Optional)		IV
_ _ _ _ _ _	-	_ _ _	-	_ _ _ _ _ _ _ _ _ _ _ _	-	_ _, _ _ _ _	+	XXXX

KEY NUMBER **Selection** **Availabil**

Description			
0-25" to 0-2700" H_2O/0-62.2 to 0-7000 mbar	STR93D	↓	
Body Rating*: 750 psi (51.7 bar) Compound Characterized			
0-20 to 0-500 psig/0-1.4 to 0-35 bar	STR94G		↓
Body Rating*: 500 psi (35 bar)			

*** Remote seal system pressure rating is body rating or seal rating, whichever is less.**

TABLE I - METER BODY

Number of Seals	1 Remote Seal (High Side)	1 _ _	◆	◆
	2 Remote Seals	2 _ _	◆	
	1 Remote Seal (Low Side)	3 _ _	◆	
Fill Fluid	Silicone (DC 200)	_ 1 _	◆	◆
(Meter Body)	CTFE	_ 2 _	q	q
Construction	**Non-Wetted Adapter Head Material**			
Standard Dual Head	316 St. St.	_ _ A		◆
	316 St. St. for Close-Couple	_ _ D		y
Standard Dual Head	316 St. St.	_ _ A	◆	
	Carbon St. (zinc-plated)	_ _ B	◆	
	316 St. St. for Close-Couple	_ _ D	y	

See Specification Sheet 34-ST-03-57 for figures on construction.

STR9_ _

TABLE II - SEALS					Selection	3D	4G
Format for Seal Selection: Specify 12 characters _ _ _ | _ _ _ _ _ _ _ _ _ Common / Required Seal **Note:** The first 3 characters are common to all seals. When selecting required seal, you must specify only the 9 selections within the required seal.							
Secondary Fill	Silicone (DC 200)				1 _ _ _ _ _ _ _ _ _	◆	◆
	CTFE				2 _ _ _ _ _ _ _ _ _	◆	◆
	Silicone (DC 704)				3 _ _ _ _ _ _ _ _ _	p	p
	Neobee (M20) **				4 _ _ _ _ _ _ _ _ _	◆	◆
	Syltherm 800 ***				5 _ _ _ _ _ _ _ _ _	p	p
Connection of Remote Seal to Meter Body	Capillary Length	5 feet	1.5 m	SS Armor	_ A _ _ _ _ _ _ _ _	◆	◆
		10 feet	3.0 m		_ B _ _ _ _ _ _ _ _	◆	◆
		15 feet	4.5 m		_ C _ _ _ _ _ _ _ _	◆	◆
		20 feet	6.1 m		_ D _ _ _ _ _ _ _ _	◆	◆
		25 feet	7.5 m		_ E _ _ _ _ _ _ _ _	◆	◆
		35 feet	10.7 m		_ F _ _ _ _ _ _ _ _	◆	◆
		5 feet	1.5 m	PVC Coated SS Armor	_ G _ _ _ _ _ _ _ _	◆	◆
		10 feet	3.0 m		_ H _ _ _ _ _ _ _ _	◆	◆
		15 feet	4.5 m		_ J _ _ _ _ _ _ _ _	◆	◆
		20 feet	6.1 m		_ K _ _ _ _ _ _ _ _	◆	◆
		25 feet	7.5 m		_ L _ _ _ _ _ _ _ _	◆	◆
		35 feet	10.7 m		_ M _ _ _ _ _ _ _ _	◆	◆
	2 inch long SS nipple close-coupled				_ 2 _ _ _ _ _ _ _ _	z	z
No Selection					_ _ 0 _ _ _ _ _ _ _	•	•
Flush Flanged Seal	**Diaphragm Diameter**	**Flange Size**	**Flange Pressure Rating ***				
	3.5"	3"	ANSI Class 150		_ _ _ AFA _ _ _ _ _	◆	◆
			ANSI Class 300		_ _ _ AFC _ _ _ _ _	◆	◆
			DIN DN80-PN40		_ _ _ AFM _ _ _ _ _	◆	◆
	Wetted Material		**Diaphragm**	**Upper Insert**			
			316L SS	316 St. St.	_ _ _ _ _ _ AA _ _ _ _	◆	◆
			Hastelloy C	316 St. St.	_ _ _ _ _ _ AB _ _ _ _	◆	◆
			Hastelloy C	Hastelloy C	_ _ _ _ _ _ AC _ _ _ _	◆	◆
			Monel	Monel	_ _ _ _ _ _ AE _ _ _ _	◆	◆
	Non-Wetted Material (upper)		CS with Polyester Powder Coating		_ _ _ _ _ _ _ 1 _ _ _	◆	◆
			316 St. St.		_ _ _ _ _ _ _ 2 _ _ _	◆	◆
	Bolts		No Selection		_ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Styles		No Selection		_ _ _ _ _ _ _ _ _ 0 _	◆	◆
	Gasket		No Selection		_ _ _ _ _ _ _ _ _ _ 0	◆	◆

Table II continued next page

* Standard facing 125-250 AARH RF (raised face) serrated surface finish.

** Limited vacuum availability.

*** Minimum static pressure requirement. No vacuum allowed. See Specification Figure 2.

Note: Remote seal system pressure rating is body rating or seal rating, whichever is less.

TABLE II - SEALS (continued)

	Diaphragm Diameter	Flange Size	Flange Pressure Rating *	Const. - See Spec. Figure 34-ST-03-57	Selection	STR9_ _ 3D	STR9_ _ 4G
Flush Flanged Seal with Lower	2.4"	1"	ANSI 150	2	_ _ _ BCA _ _ _ _ _ _	◆	◆
			ANSI 300	2	_ _ _ BCC _ _ _ _ _ _	◆	◆
		1-1/2"	ANSI 150	2	_ _ _ BGA _ _ _ _ _ _	◆	◆
			ANSI 300	2	_ _ _ BGC _ _ _ _ _ _	◆	◆
		2"	ANSI 150	2	_ _ _ BDA _ _ _ _ _ _	◆	◆
			ANSI 300	2	_ _ _ BDC _ _ _ _ _ _	◆	◆
		3"	ANSI 150	2	_ _ _ BFA _ _ _ _ _ _	◆	◆
			ANSI 300	2	_ _ _ BFC _ _ _ _ _ _	◆	◆
	2.9"	1/2"	ANSI 150	3	_ _ _ CAA _ _ _ _ _ _	◆	◆
		1"	ANSI 150	3	_ _ _ CCA _ _ _ _ _ _	◆	◆
			ANSI 300	3	_ _ _ CCC _ _ _ _ _ _	◆	◆
		1-1/2"	ANSI 150	2	_ _ _ CGA _ _ _ _ _ _	◆	◆
			ANSI 300	2	_ _ _ CGC _ _ _ _ _ _	◆	◆
		2"	ANSI 150	2	_ _ _ CDA _ _ _ _ _ _	◆	◆
			ANSI 300	2	_ _ _ CDC _ _ _ _ _ _	◆	◆
	4.1"	1/2"	ANSI 150	3	_ _ _ DAA _ _ _ _ _ _	◆	◆
		1"	ANSI 150	3	_ _ _ DCA _ _ _ _ _ _	◆	◆
			ANSI 300	3	_ _ _ DCC _ _ _ _ _ _	◆	◆
		1-1/2"	ANSI 150	3	_ _ _ DGA _ _ _ _ _ _	◆	◆
			ANSI 300	3	_ _ _ DGC _ _ _ _ _ _	◆	◆
		2"	ANSI 150	3	_ _ _ DDA _ _ _ _ _ _	◆	◆
			ANSI 300	2	_ _ _ DDC _ _ _ _ _ _	◆	◆
		3"	ANSI 150	2	_ _ _ DFA _ _ _ _ _ _	◆	◆
			ANSI 300	2	_ _ _ DFC _ _ _ _ _ _	◆	◆
	Wetted Material		**Diaphragm**	**Lower**			
			316L SS	316 St. St.	_ _ _ _ _ _ BA _ _ _ _	◆	◆
			Hastelloy C	316 St. St.	_ _ _ _ _ _ BB _ _ _ _	◆	◆
			Hastelloy C	Hastelloy C	_ _ _ _ _ _ BC _ _ _ _	◆	◆
			Monel	Monel	_ _ _ _ _ _ BE _ _ _ _	◆	◆
			Tantalum	316 St. St.	_ _ _ _ _ _ BF _ _ _ _	◆	◆
			Tantalum	Hastelloy C	_ _ _ _ _ _ BG _ _ _ _	◆	◆
	Non-Wetted Material (upper, upper insert)		**Upper**	**Upper Insert**			
			316 St. St.	316 St. St.	_ _ _ _ _ _ _ _ 4 _ _ _	◆	◆
			CS	316 St/ St.	_ _ _ _ _ _ _ _ 5 _ _ _	◆	◆
	Bolts		No Selection		_ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Styles		Without 1/4" NPT Flushing Connection		_ _ _ _ _ _ _ _ _ _ 0 _	◆	◆
			With 1/4" NPT Flushing Connection		_ _ _ _ _ _ _ _ _ _ 7 _	◆	◆
	Gasket		Klinger C-4401 (non-asbestos)		_ _ _ _ _ _ _ _ _ _ K	c	c
			Grafoil		_ _ _ _ _ _ _ _ _ _ G	d	d

Table II continued next page

* Standard facing 125-250 AARH RF (raised face) serrated finish.

Note: Remote seal system pressure rating is body rating or seal rating, whichever is less.

TABLE II - SEALS (continued)

					Selection	STR9_ _ 3D	4G
Flange Seal with Extended Diaphragm	**Diaphragm Diameter**	**Flange Size**	**Flange Pressure Rating ***				
	2.9" (2.85")	3" (2.85" OD extension)	ANSI Class 150		_ _ _ EFA _ _ _ _ _ _	◆	◆
			ANSI Class 300		_ _ _ EFC _ _ _ _ _ _	◆	◆
			DIN DN80-PN40		_ _ _ EFM _ _ _ _ _ _	◆	◆
	3.5"	4" (3.70" OD extension)	ANSI Class 150		_ _ _ FGA _ _ _ _ _ _	◆	◆
			ANSI Class 300		_ _ _ FGC _ _ _ _ _ _	◆	◆
			DIN DN100-PN40		_ _ _ FGP _ _ _ _ _ _	◆	◆
	Wetted Material		**Diaphragm**	**Lower**			
			316L SS	316 St. St.	_ _ _ _ _ _ EA _ _ _ _	◆	◆
			Hastelloy C	316 St. St.	_ _ _ _ _ _ EB _ _ _ _	◆	◆
			Hastelloy C	Hastelloy C	_ _ _ _ _ _ EC _ _ _ _	◆	◆
	Non-Wetted Material (flange)		CS with Polyester Powder Coating		_ _ _ _ _ _ _ 7 _ _ _	◆	◆
	Bolts		No Selection		_ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Extension Length		2"		_ _ _ _ _ _ _ _ _ 2 _	◆	◆
			4"		_ _ _ _ _ _ _ _ _ 4 _	◆	◆
			6"		_ _ _ _ _ _ _ _ _ 6 _	◆	◆
			No Selection		_ _ _ _ _ _ _ _ _ 0	◆	◆
Pancake Seal	**Diaphragm Diameter**	**Flange Size**	**Flange Pressure Rating** Dependent on customer flange**				
	3.5"	3"	ANSI Class 150/300/600		_ _ _ GFA _ _ _ _ _	◆	◆
	Wetted Material		**Diaphragm**	**Body**			
			316L SS	316 St. St.	_ _ _ _ _ _ GA _ _ _ _	◆	◆
			Hastelloy C	316 St. St.	_ _ _ _ _ _ GB _ _ _ _	◆	◆
			Hastelloy C	Hastelloy C	_ _ _ _ _ _ GC _ _ _ _	◆	◆
			Monel	Monel	_ _ _ _ _ _ GE _ _ _ _	◆	◆
	Non-Wetted Material		No Selection		_ _ _ _ _ _ _ 0 _ _ _	◆	◆
	Bolts		No Selection		_ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Styles		No Selection		_ _ _ _ _ _ _ _ _ 0 _	◆	◆
			No Selection		_ _ _ _ _ _ _ _ _ 0	◆	◆

Table II continued next page

* Standard facing 125-250 AARH RF (raised face) serrated finish.

** Caution: Maximum working pressure of STR93D transmitter is 750 psi and STR94G transmitte is 500 psig. Damage to sensor may result if pressure limit is exceeded.

Note: Remote seal system pressure rating is body rating or seal rating, whichever is less.

TABLE II - SEALS (continued)

					Selection	STR9_ _ 3D	4G
Chemical Tee "Taylor" Wedge	**Diaphragm Diameter**	**Flange Size**	**Flange Pressure Rating**				
	3.5"	Taylor Wedge 5" O.D.	750 psi		_ _ _ HM0 _ _ _ _ _ _	v	
			Diaphragm	**Lower**			
	Wetted Material		316L SS	316 St. St.	_ _ _ _ _ _ HA _ _ _ _	◆	
			Hastelloy C	316 St. St.	_ _ _ _ _ _ HB _ _ _ _	◆	
	Non-Wetted Material		No Selection		_ _ _ _ _ _ _ _ 0 _ _ _	◆	
	Bolts		No Selection		_ _ _ _ _ _ _ _ _ 0 _ _	◆	
	Styles		No Selection		_ _ _ _ _ _ _ _ _ _ 0 _	◆	
			No Selection		_ _ _ _ _ _ _ _ _ _ _ 0	◆	
Seal with Threaded Process Connection	**Diaphragm Diameter**	**Threaded Process Connection Size (NPT Female)**	**Seal Pressure Rating *** **CS Bolts**	**304 SS Bolts**			
	2.4"	1/2" NPT			_ _ _ JJG _ _ _ _ _ _	◆	◆
		3/4" NPT			_ _ _ JKG _ _ _ _ _ _	◆	◆
		1" NPT	2500	1250	_ _ _ JLG _ _ _ _ _ _	◆	◆
	2.9"	1/2" NPT			_ _ _ KJG _ _ _ _ _ _	◆	◆
		3/4" NPT	2500	1250	_ _ _ KKG _ _ _ _ _ _	◆	◆
		1" NPT	psi	psi	_ _ _ KLG _ _ _ _ _ _	◆	◆
	4.1"	1/2" NPT			_ _ _ LJG _ _ _ _ _ _	◆	◆
		3/4" NPT	1500	750	_ _ _ LKG _ _ _ _ _ _	◆	◆
		1" NPT	psi	psi	_ _ _ LLG _ _ _ _ _ _	◆	◆
			Diaphragm	**Lower**			
	Wetted Material		316L SS	CS	_ _ _ _ _ _ JA _ _ _ _	◆	◆
			316L SS	316 St. St.	_ _ _ _ _ _ JB _ _ _ _	◆	◆
			Hastelloy C	316 St. St.	_ _ _ _ _ _ JC _ _ _ _	◆	◆
			Hastelloy C	Hastelloy C	_ _ _ _ _ _ JD _ _ _ _	◆	◆
			Monel	Monel	_ _ _ _ _ _ JE _ _ _ _	◆	◆
			Tantalum	316 St. St.	_ _ _ _ _ _ JF _ _ _ _	◆	◆
			Tantalum	Hastelloy C.	_ _ _ _ _ _ JG _ _ _ _	◆	◆
	Non-Wetted Material (upper)		CS with Polyester Powder Coating		_ _ _ _ _ _ _ _ A _ _ _	◆	◆
			Stainless Steel		_ _ _ _ _ _ _ _ C _ _ _	w	w
	Bolts		C.S.		_ _ _ _ _ _ _ _ _ C _ _	◆	◆
			304 St. St.		_ _ _ _ _ _ _ _ _ D _ _	◆	◆
	Styles		W/O Flushing Connection		_ _ _ _ _ _ _ _ _ _ A _	◆	◆
			With Flushing Connection		_ _ _ _ _ _ _ _ _ _ F _	◆	◆
	Gasket		Klinger C-4401 (non-asbestos)		_ _ _ _ _ _ _ _ _ _ _ K	c	c
			Grafoil		_ _ _ _ _ _ _ _ _ _ _ G	d	d

Table II continued next page

* Caution: Maximum working pressure of STR93D transmitter is 750 psi and STR94G transmitter is 500 psig. Damage to sensor may result if pressure limit is exceeded.

Note: Remote seal system pressure rating is body rating or seal rating, whichever is less.

STR9_ _

TABLE II - SEALS (continued)

					Selection	3D	4G
Sanitary Seal	**Diaphragm Diameter**	**Flange Size**	**Pressure Rating**				
	1.9"	2"	Customer clamp rating		_ _ _ MD0 _ _ _ _ _ _	g	◆
	2.4"	2-1/2"	or 600 psi, whichever		_ _ _ NE0 _ _ _ _ _ _	◆	◆
	2.9"	3"	is less		_ _ _ PF0 _ _ _ _ _ _	◆	◆
	4.1"	4"			_ _ _ QG0 _ _ _ _ _ _	◆	◆
			Diaphragm	**Body**			
	Wetted Material		316L SS	316 St. St.	_ _ _ _ _ _ N A _ _ _ _	◆	◆
	Non-Wetted Material		No Selection		_ _ _ _ _ _ _ _ 0 _ _ _	◆	◆
	Bolts		No Selection		_ _ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Styles		Tri-Clover Tri-Clamp		_ _ _ _ _ _ _ _ _ _ 8 _	◆	◆
	Gasket		No Selection		_ _ _ _ _ _ _ _ _ _ _ 0	◆	◆
Saddle Seal	**Diaphragm Diameter**	**Size and Bolt Pattern**	**Seal Pressure Rating * *** **C.S. Bolts**	**304 St. St. Bolts**			
	2.4"	for 3" pipe-Conoflow or 4" or larger pipe-Conoflow	1250 psi	1250 psi	_ _ _ RPK _ _ _ _ _ _	◆	◆
					_ _ _ RQK _ _ _ _ _ _	◆	◆
			Diaphragm	**Lower Housing**			
	Wetted Material		316L SS	C. S.	_ _ _ _ _ _ RA _ _ _ _	◆	◆
			316L SS	316 St. St.	_ _ _ _ _ _ RB _ _ _ _	◆	◆
			Hastelloy C	316 St. St.	_ _ _ _ _ _ RC _ _ _ _	◆	◆
			316 LSS	N/A-Body Only	_ _ _ _ _ _ SB _ _ _ _	◆	◆
			Hastelloy C	N/A-Body Only	_ _ _ _ _ _ SC _ _ _ _	◆	◆
	Non-Wetted Material		**Body**	**Bolts ***			
			C. S.	C. S.	_ _ _ _ _ _ _ _ B _ _ _	◆	◆
			316 St. St.	304 St. St.	_ _ _ _ _ _ _ _ C _ _ _	◆	◆
	No Selection				_ _ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Styles		No Selection		_ _ _ _ _ _ _ _ _ _ 0 _	◆	◆
	Gasket		No Selection		_ _ _ _ _ _ _ _ _ _ _ 0	◆	◆

* Bolts are not included with "Body only" selection.

** Caution: Maximum working pressure of STR93D transmitter is 750 psi and STR94G transmitte is 500 psig. Damage to sensor may result if pressure limit is exceeded.

Note: Remote seal system pressure rating is body rating or seal rating, whichever is less.
All sanitary seals have dairy grade 3A approval.

TABLE III - OPTIONS	Selection	STR9_ _ 3D	4G	
None	00	◆	◆	
HART® Protocol Compatible Electronics	HC	e	e	b
FOUNDATION Fieldbus Communications	FF	r	r	
Analog Meter (0-100 Even 0-10 Square Root)	ME	◆	◆	b
Smart Meter	SM	◆	◆	
Custom Configuration of Smart Meter	CI	m	m	
Local Zero	LZ	x	x	
Local Zero and Span	ZS	s	s	
Lightning Protection	LP	◆	◆	
Custom Calibration and I.D. in Memory	CC	◆	◆	
Transmitter Configuration	TC	◆	◆	
Write Protection	WP	◆	◆	
End Cap Live Circuit Warning Label in Spanish (only with ATEX 3D)	SP	a	a	
End Cap Live Circuit Warning Label in Portuguese (only with ATEX 3D)	PG	a	a	b
End Cap Live Circuit Warning Label in Italian (only with ATEX 3D)	TL	a	a	
End Cap Live Circuit Warning Label in German (only with ATEX 3D)	GE	a	a	
A286SS (NACE) Bolts and 302/304SS (NACE) Nuts for Heads	CR	◆		
Stainless Steel Customer Wired-On Tag (4 lines, 28 characters per line, customer supplied information)	TG	◆	◆	
Stainless Steel Customer Wired-On Tag (blank)	TB	◆	◆	
Mounting Bracket - Carbon Steel	MB	◆	◆	
Mounting Bracket - ST. ST.	SB	◆	◆	b
Flat Mounting Bracket	FB	◆	◆	
316 ST.ST. Electronics Housing - *with M20 Conduit Connections*	SH	n	n	
1/2" NPT to M20 316SS Conduit Adapter (BASEEFA EEx d IIC)	A1	n	n	b
1/2" NPT to 3/4" NPT 316 SS Conduit Adapter	A2	u	u	
Stainless Steel Housing with M20 to 1/2" NPT 316 SS Conduit Adapter *(use for FM and CSA Approvals)*	A3	i	i	
Clean Transmitter for Oxygen or Chlorine Service with Certificate	0X	h	h	
Marine Type Approvals (DNV, ABS, BV & LR)	MT	2	2	
Over-Pressure Leak Test with F3392 Certificate	TP	◆	◆	
Calibration Test Report and Certificate of Conformance (F3399)	F1	◆	◆	b
Certificate of Conformance (F3391)	F3	◆	◆	
Certificate of Origin (F0195)	F5	◆	◆	
FMEDA (SIL) Certificate	F6	◆	◆	
NACE Certificate (F0198)	F7	o	◆	
Additional Warranty - 1 year	W1	◆	◆	
Additional Warranty - 2 years	W2	◆	◆	b
Additional Warranty - 3 years	W3	◆	◆	
Additional Warranty - 4 years	W4	◆	◆	

Table III continued next page

STR9_ _

TABLE III - OPTIONS (continued)

Approval Body	Approval Type	Location or Classification	Selection	3D	4G	
No hazardous location approvals			9X	◆	◆	
Factory Mutual	Explosion Proof	Class I, Div. 1, Groups A,B,C,D	1C	◆	◆	
	Dust Ignition Proof	Class II, III Div. 1, Groups E,F,G				
	Non-Incendive	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				
CSA	Explosion Proof	Class I, Div. 1, Groups B,C,D	2J	◆	◆	b
	Dust Ignition Proof	Class II, III, Div. 1, Groups E,F,G				
	Intrinsically Safe	Class I, II, III, Div. 1, Groups A,B,C,D,E,F,G				
SA (Australia)	Intrinsically Safe	Ex ia IIC T4	4G	◆	◆	
	Non-Sparking	Ex n IIC T6 (T4 with SM option)				
ATEX*	Intrinsically Safe, Zone 0/1	Ex II 1G EEx ia IIC T4, T5,T6	3S	◆	◆	
	Flameproof, Zone 1	Ex II 2G EEx d IIC T5, T6, Enclosure IP 66/67	3D	◆	◆	
	Non-Sparking, Zone 2	Ex II 3G EEx nA, IIC T6 (Honeywell). Enclosure IP 66/67	3N	◆	◆	
	Multiple Marking** Int. Safe, Zone 0/1, or Flameproof, Zone 1, or Non-Sparking, Zone 2	Ex II 1 G EEx ia IIC T4, T5, T6 Ex II 2 G EEx d IIC T5, T6 Ex II 3 G EEx nA, IIC T6 (Honeywell) Enclosure IP 66/67	3H	◆	◆	
INMETRO (Brazil)	Flameproof, Zone 1	Ex d IIC T5	6D	◆	◆	

*See ATEX installation requirements in the ST 3000 User's Manual

**The user must determine the type of protection required for installation of the equipment. The user shall then check the box [✔] adjacent to the type of protection used on the equipment certification nameplate. Once a type of protection has been checked on the nameplate, the equipment shall not then be reinstalled using any of the other certification types.

TABLE IV

Factory Identification	XXXX	◆	◆

RESTRICTIONS

Restriction		Available Only With		Not Available With
Letter	**Table**	**Selection**	**Table**	**Selection**
a	III	3D or 3H		
b	Select only one option from this group			
c			II	_ _ _ _ _ _ BF _ _ _ _, _ _ _ _ _ _ BG _ _ _ _, _ _ _ _ _ _ JF _ _ _ _, _ _ _ _ _ _ JG _ _ _ _,
d	II	_ _ _ _ _ _ BF _ _ _ _, _ _ _ _ _ _ BG _ _ _ _, _ _ _ _ _ _ JF _ _ _ _, _ _ _ _ _ _ JG _ _ _ _,		
e			III	4G
h	I, II	_ 2 _ - 2 _ _ _ _ _ _ _ _ _ _ _ _		
i	III	1C or 2J		
m	III	SM		
n			III	1C, 2J
o	III	CR		
p			II	DC704 and Sylthern 800 fills and close-couple require SS seal upper. _ _ _ BCA _ _ 5 _ _ _, _ _ _ CAA _ _ 5 _ _ _, _ _ _ CCA _ _ 5 _ _ _, _ _ _ CCC _ _ 5 _ _ _, _ _ _ DAA _ _ 5 _ _ _, _ _ _ DCA _ _ 5 _ _ _, _ _ _ DCC _ _ 5 _ _ _, _ _ _ DGA _ _ 5 _ _ _, _ _ _ DGC _ _ 5 _ _ _, _ _ _ DDA _ _ 5 _ _ _, _ _ _ _ _ _ GE _ _ _ _, _ _ _ _ _ _ _ _ A _ _ _ _ _ _ _ _ _ _ _ B _ _ _
q	II	2 _ _ _ _ _ _ _ _ _ _ _ _ _, 4 _ _ _ _ _ _ _ _ _ _ _ _		
r			III	TC, ME, 4G, 3S
s			III	FF, ME
g	II	_ A _ _ _ _ _ _ _ _ _ _, _ B _ _ _ _ _ _ _ _ _ _, _ C _ _ _ _ _ _ _ _ _ _, _ G _ _ _ _ _ _ _ _ _ _, _ H _ _ _ _ _ _ _ _ _ _, _ J _ _ _ _ _ _ _ _ _ _, _ 2 _ _ _ _ _ _ _ _ _ _,		

RESTRICTIONS - (continued)

Restriction		Available Only With		Not Available With
Letter	**Table**	**Selection**	**Table**	**Selection**
u	III	1C, 2J		
v	I	2 _ _		
w			II	_ _ _ _ _ _ JA _ _ _ _
x	III	FF, SM		
y	I II	1 _ _, 3 _ _ _ 2 _ _ _ _ _ _ _ _ _ _	III	MB, SB, FB DC704 and Syltherm 800 fills and close-couple require SS seal upper. _ _ _ BCA _ _ 5 _ _ _, _ _ _ CAA _ _ 5 _ _ _, _ _ _ CCA _ _ 5 _ _ _, _ _ _ CCC _ _ 5 _ _ _, _ _ _ DAA _ _ 5 _ _ _, _ _ _ DCA _ _ 5 _ _ _, _ _ _ DCC _ _ 5 _ _ _, _ _ _ DGA _ _ 5 _ _ _, _ _ _ DGC _ _ 5 _ _ _, _ _ _ DDA _ _ 5 _ _ _, _ _ _ _ _ _ GE _ _ _ _, _ _ _ _ _ _ _ _ A _ _ _ _ _ _ _ _ _ _ _ B _ _ _
z	I	_ _ D		
2			III	FB

Note: See ST-83 for Published Specials with pricing.
See ST-89 and User's Manual for part numbers.
See ST-OE-9 for OMS Order Entry Information including TC, manuals, certificates, drawings and SPINS.
See ST-OD-1 for tagging, ID, Transmitter Configuration (TC) and calibration including factory default values.
To request a quotation for a non-published "special", fax RFQ with Application Data Sheet (34-ST-18-01) to Marketing Applications.

TABLE 1 - Flush Flanged Seals **Diaphragm Diameter = 3.5"**

Number of	Seal Materials		Flange Size - Pressure Rating - Code		
Seals	Wetted	Non-wetted	AFA	AFC	AFM
1	AA	1	407	421	473
1	AB	1	464	478	530
1	AC	1	640	741	780
1	AE	1	549	563	615
1	AA	2	580	638	647
1	AB	2	638	696	706
1	AC	2	741	828	860
1	AE	2	681	740	748
2	AA	1	814	843	947
2	AB	1	928	957	1061
2	AC	1	1279	1481	1561
2	AE	1	1098	1126	1230
2	AA	2	1161	1275	1289
2	AB	2	1275	1391	1412
2	AC	2	1481	1656	1720
2	AE	2	1363	1479	1495

TABLE 2 - Flush Flanged Seals with Lowers **Diaphragm Diameter = 2.4"**

Number of	Seal Materials		Flange Size - Pressure Rating - Code							
		Non								
Seals	Wetted	Wetted	BCA	BCC	BGA	BGC	BDA	BDC	BFA	BFC
1	BA	4	422	528	422	528	564	652	710	934
1	BB	4	445	560	445	560	585	673	731	955
1	BC	4	604	717	604	717	854	927	1180	1390
1	BE	4	452	564	452	564	636	724	839	1042
1	BF	4	474	580	474	580	617	704	762	986
1	BG	4	633	747	633	747	884	957	1211	1420
1	BA	5	242	297	242	297	341	398	405	507
1	BB	5	263	318	263	318	361	420	426	528
1	BC	5	422	485	422	485	629	673	876	963
1	BE	5	270	333	270	333	412	470	536	615
1	BF	5	294	349	294	349	393	450	457	559
1	BG	5	453	515	453	515	660	704	906	993
2	BA	4	845	1057	845	1057	1128	1303	1419	1869
2	BB	4	888	1120	888	1120	1172	1346	1463	1910
2	BC	4	1207	1434	1207	1434	1709	1854	2359	2780
2	BE	4	903	1128	903	1128	1273	1448	1679	2085
2	BF	4	949	1161	949	1161	1234	1407	1523	1973
2	BG	4	1267	1494	1267	1494	1769	1915	2423	2841
2	BA	5	482	593	482	593	680	795	810	1013
2	BB	5	526	636	526	636	722	840	853	1057
2	BC	5	845	970	845	970	1259	1346	1752	1925
2	BE	5	541	666	541	666	824	940	1072	1230
2	BF	5	587	697	587	697	784	899	914	1117
2	BG	5	905	1030	905	1030	1319	1407	1813	1987

TABLE 3 - Flush Flanged Seals with Lowers Diaphragm Diameter = 2.9"

Number of	Seal Materials		Flange Size - Pressure Rating - Code						
Seals	Wetted	Non-wetted	CAA	CCA	CCC	CGA	CGC	CDA	CDC
1	BA	4	496	496	496	496	496	635	685
1	BB	4	516	516	516	516	516	658	708
1	BC	4	1002	1002	1002	1002	1002	983	1027
1	BE	4	567	567	567	567	567	722	810
1	BF	4	548	548	548	548	548	687	738
1	BG	4	1032	1032	1032	1032	1032	1013	1057
1	BA	5	357	357	357	357	357	411	432
1	BB	5	378	378	378	378	378	432	455
1	BC	5	865	865	865	865	865	759	773
1	BE	5	429	429	429	429	429	498	556
1	BF	5	409	409	409	409	409	463	485
1	BG	5	895	895	895	895	895	788	803
2	BA	4	990	990	990	990	990	1271	1371
2	BB	4	1032	1032	1032	1032	1032	1315	1415
2	BC	4	2004	2004	2004	2004	2004	1967	2053
2	BE	4	1134	1134	1134	1134	1134	1444	1619
2	BF	4	1094	1094	1094	1094	1094	1375	1477
2	BG	4	2064	2064	2064	2064	2064	2027	2114
2	BA	5	714	714	714	714	714	822	866
2	BB	5	758	758	758	758	758	866	909
2	BC	5	1729	1729	1729	1729	1729	1517	1546
2	BE	5	860	860	860	860	860	995	1111
2	BF	5	819	819	819	819	819	926	970
2	BG	5	1789	1789	1789	1789	1789	1577	1607

TABLE 4 - Flush Flanged Seals with Lowers Diaphragm Diameter = 4.1"

Number of	Seal Materials		Flange Size - Pressure Rating - Code								
Seals	Wetted	Non-wetted	DAA	DCA	DCC	DGA	DGC	DDA	DDC	DFA	DFC
1	BA	4	748	748	770	748	770	685	599	881	1082
1	BB	4	814	814	835	814	835	751	853	947	1146
1	BC	4	1379	1379	1429	1379	1429	1280	1294	1490	1669
1	BE	4	891	891	979	891	979	866	968	1047	1246
1	BF	4	857	857	879	857	879	795	896	990	1190
1	BG	4	1422	1422	1473	1422	1473	1323	1338	1533	1712
1	BA	5	596	596	618	596	618	533	533	577	655
1	BB	5	662	662	683	662	683	600	600	643	719
1	BC	5	1227	1227	1278	1227	1278	1128	1041	1186	1241
1	BE	5	740	740	826	740	826	714	714	743	820
1	BF	5	706	706	727	706	727	643	643	685	763
1	BG	5	1270	1270	1320	1270	1320	1172	1084	1094	1285
2	BA	4	1496	1496	1540	1496	1540	1371	1575	1763	2164
2	BB	4	1627	1627	1671	1627	1671	1502	1706	1893	2293
2	BC	4	2757	2757	2859	2757	2859	2559	2589	2979	3337
2	BE	4	1783	1783	1958	1783	1958	1731	1935	2093	2493
2	BF	4	1715	1715	1758	1715	1758	1590	1791	1961	2381
2	BG	4	2845	2845	2947	2845	2947	2647	2675	3067	3423
2	BA	5	1192	1192	1236	1192	1236	1068	1068	1155	1309
2	BB	5	1323	1323	1367	1323	1367	1199	1199	1286	1438
2	BC	5	2641	2641	2555	2641	2555	2255	2255	2373	2481
2	BE	5	1479	1479	1652	1479	1652	1427	1427	1486	1640
2	BF	5	1411	1411	1455	1411	1455	1286	1286	1371	1525
2	BG	5	2541	2541	2641	2541	2641	2343	2343	2459	2569

TABLE 5 - Price Add for Flush Flanged Seals with Lowers and Flushing Connection: Code = 7

Number of Seals	Seal Materials	Flange Size - Pressure Rating - Code		
	Wetted	Diaph. Dia. = 2.4" BCA, BCC, BGA,, BGC, BDA, BDC, BFA, BFC	Diaph. Dia. = 2.9" CAA, CCA, CCC, CGA, CGC, CDA, CDC	Diaph. Dia. = 4.1" DAA, DCA, DCC, DGA, DGC, DDA, DDC, DFA, DFC
1	BA	44	44	115
1	BB	44	44	115
1	BC	101	138	159
1	BE	95	131	145
1	BF	44	44	115
1	BG	101	138	159
2	BA	88	88	231
2	BB	88	88	231
2	BC	202	274	318
2	BE	190	260	290
2	BF	88	88	231
2	BG	202	274	318

TABLE 6 - Flanged Seals with Extended Diaphragms

Number of Seals	Seal Materials		Flange Size - Pressure Rating - Code					
	Wetted	Extension	Diaphragm Diameter = 2.9"			Diaphragm Diameter = 3.5"		
			EFA	EFC	EFM	FGA	FGC	FGP
1	EA	2	744	760	811	807	832	890
1	EB	2	766	781	832	865	890	948
1	EC	2	1135	1151	1201	1973	2001	2057
1	EA	4	787	803	854	865	890	948
1	EB	4	810	825	876	922	948	1006
1	EC	4	1346	1364	1412	2252	2282	2338
1	EA	6	831	847	898	922	948	1006
1	EB	6	853	869	920	980	1006	1064
1	EC	6	1559	1577	1623	2533	2560	2618
2	EA	2	1488	1519	1621	1613	1665	1781
2	EB	2	1531	1563	1665	1729	1781	1895
2	EC	2	2271	2301	2401	3945	4004	4114
2	EA	4	1575	1607	1709	1729	1781	1895
2	EB	4	1619	1650	1752	1843	1895	2012
2	EC	4	2693	2727	2823	4505	4563	4676
2	EA	6	1663	1694	1796	1843	1895	2012
2	EB	6	1706	1737	1839	1960	2012	2129
2	EC	6	3117	3155	3246	5064	5120	5238

TABLE 7 - Seals with Threaded Process Connection with Carbon Steel Uppers: Code = A

Number of Seals	Material - Wetted without Flushing Connection	Flange Size - Pressure Rating - Code		Diaph. Dia. = 4.1"
		Diaph. Dia. = 2.4" JJG, JKG, JLG	Diaph. Dia. = 2.9" KJG, KKG, KLG	LJG, LKG, LLG
1	JA	146	173	371
1	JB	206	233	459
1	JC	227	254	523
1	JD	553	605	1089
1	JE	264	307	553
1	JF	259	285	567
1	JG	605	658	1199
2	JA	292	348	743
2	JB	412	466	919
2	JC	456	508	1047
2	JD	1105	1209	2179
2	JE	528	614	1105
2	JF	518	570	1134
2	JG	1209	1315	2397

TABLE 8 - Seals with Threaded Process Connection with Stainless Steel Uppers: Code = C

Number of Seals	Material - Wetted without Flushing Connection	Flange Size - Pressure Rating - Code		Diaph. Dia. = 4.1"
		Diaph. Dia. = 2.4" JJG, JKG, JLG	Diaph. Dia. = 2.9" KJG, KKG, KLG	LJG, LKG, LLG
1	JB	337	370	611
1	JC	359	393	676
1	JD	683	743	1241
1	JE	395	445	705
1	JF	389	422	719
1	JG	735	795	1349
2	JB	674	741	1221
2	JC	718	784	1353
2	JD	1367	1486	2483
2	JE	788	888	1409
2	JF	778	845	1438
2	JG	1471	1590	2699

TABLE 9 - Price Add for Seals with Threaded Process Connection and Flushing Connection - Code = F

Number of Seals	Seal Materials Wetted	Flange Size - Pressure Rating - Code Diaph. Dia. = 2.4" JJG, JKG, JLG	Diaph. Dia. = 2.9" KJG, KKG, KLG	Diaph. Dia. = 4.1" LJG, LKG, LLG
1	JA	19	19	88
1	JB	30	30	88
1	JC	30	30	88
1	JD	55	55	159
1	JE	30	30	88
1	JF	30	30	88
1	JG	55	55	159
2	JA	40	40	174
2	JB	58	58	174
2	JC	58	58	174
2	JD	110	110	318
2	JE	58	58	174
2	JF	58	58	174
2	JG	110	110	318

TABLE 10 - Saddle Seals Diaphragm Diameter = 2.4"

Number of Seals	Material Wetted	Non-Wetted	Size - Pressure Rating - Code RPK	RQK
1	RA	B	285	277
1	RB	B	497	377
1	RC	B	427	400
1	SB	B	184	184
1	SC	B	209	209
1	RA	C	445	437
1	RB	C	566	537
1	RC	C	588	559
1	SB	C	335	335
1	SC	C	361	361
2	RA	B	570	556
2	RB	B	814	756
2	RC	B	855	799
2	SB	B	366	366
2	SC	B	418	418
2	RA	C	888	874
2	RB	C	1132	1064
2	RC	C	1176	1117
2	SB	C	670	670
2	SC	C	722	722

Model Selection Guide, cont.

Type	Size	Non-wetted Material	Wetted Materials		Construction See Figure	Dimension 3.5" Diaphragm Dia. (in.)	
			Diaphragm	Upper Insert		A	B
Flush Flanged Seal	3" 150	CS	316 LSS Hast C Hast C Monel Monel	SS SS Hast C SS Monel	8a	7.50	1.10
		SS	316 LSS Hast C Monel	N/A	8b 8a 8b		0.94 1.10 0.94
	3" 300	CS	316 LSS Hast C Hast C Monel Monel	SS SS Hast C SS Monel	8a	8.25	1.31
		SS	316 LSS Hast C Monel	N/A	8b 8a 8b		1.12 1.31 1.12
	DIN DN80-PN40	CS	316 LSS Hast C Hast C Monel Monel	SS SS Hast C SS Monel	8a	7.87	1.07
		SS	316 LSS Hast C Monel	N/A	8b 8a 8b		0.94 1.07 0.94

Model Selection Guide, cont.

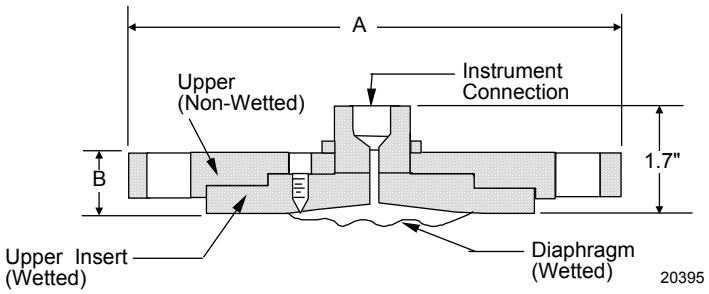


Figure 8a. Flush Flanged Seal

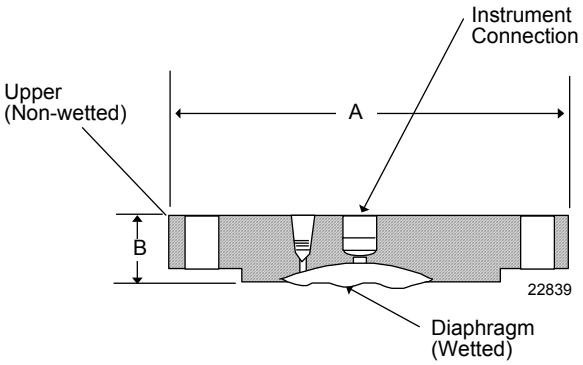


Figure 8b. Flush Flanged Seal

Model Selection Guide, cont.

Type	Size		Dim.	2.4" Diaph. Dia. (in.)	2.9" Diaph. Dia. (in.)	4.1" Diaph. Dia. (in.)
Flush Flanged Seal with Lower	150	1/2"	A	□3.50	□4.00	□5.30
			B	□2.00	□2.00	□2.10
			C	—	—	—
		1"	A	■ 4.00	□4.00	□5.30
			B	■ 1.70	□2.10	□2.10
			C	■ 1.10	—	—
		1-1/2"	A	■ 5.00	■ 5.00	□5.30
			B	■ 1.80	■ 1.90	□2.10
			C	■ 1.20	■ 1.30	—
		2"	A	■ 6.00	■ 6.00	□5.80
			B	■ 1.90	■ 1.90	□2.00
			C	■ 1.40	■ 1.40	—
		3"	A	■ 7.50	■ 7.50	■ 7.50
			B	■ 2.30	■ 2.30	■ 2.00
			C	■ 1.90	■ 1.90	■ 1.60
	300	1"	A	■ 4.90	□4.50	□5.30
			B	■ 1.90	□2.10	□2.10
			C	■ 1.30	—	—
		1-1/2"	A	■ 6.10	■ 6.10	□5.80
			B	■ 1.80	■ 1.90	□2.30
			C	■ 1.20	■ 1.40	—
		2"	A	■ 6.50	■ 6.50	■ 6.50
			B	■ 1.90	■ 1.90	■ 2.30
			C	■ 1.50	■ 1.50	■ 1.90
		3"	A	■ 8.30	■ 8.30	■ 8.30
			B	■ 2.70	■ 2.70	■ 2.30
			C	■ 2.10	■ 2.10	■ 2.10

Dimensions without flushing connection.

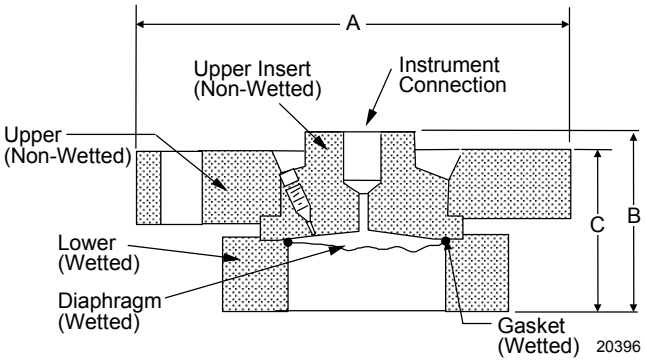


Figure 9. Flush Flanged Seal with Lower (■)

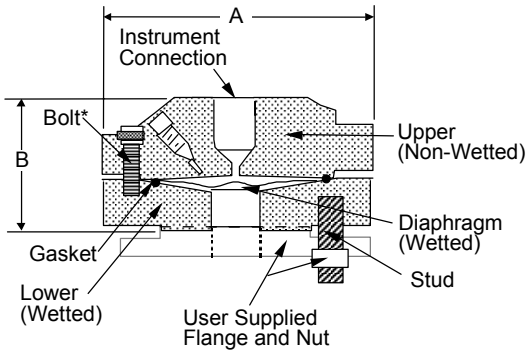


Figure 10. Flush Flanged Seal with Lower (□)

Type	Size	Dim.	2.9" Diaph. Dia. (in.)	3.5" Diaph. Dia. (in.)
Flanged Seal with Extended Diaphragm	3" 150	A	7.50	—
		B	0.94	—
		C*	2.85	
	3" 300	A	8.25	—
		B	1.12	—
		C*	2.85	
	DIN DN80-PN40	A	7.87	—
		B	0.94	—
		C*	2.85	
	4" 150	A	—	9.00
		B	—	0.94
		C*		3.70
	4" 300	A	—	10.00
		B	—	1.25
		C*		3.70
	DIN DN100-PN40	A	—	9.25
		B	—	0.94
		C*		3.70

* Designed to mate with Sch 40 pipe

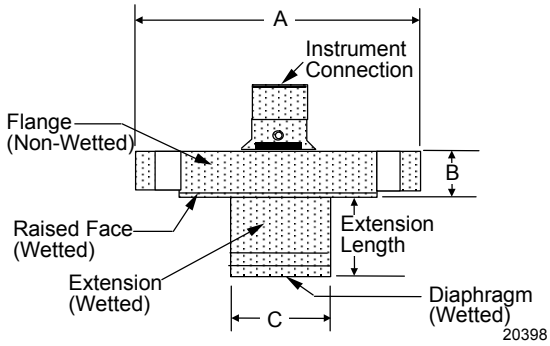


Figure 11. Flanged Seal with Extended Diaphragm

Model Selection Guide, cont.

Type	Size	Dimension	3.5" Diaph. Dia. (in.)
Pancake Seal	3" 150/300/ 600	A B	5.00 0.90

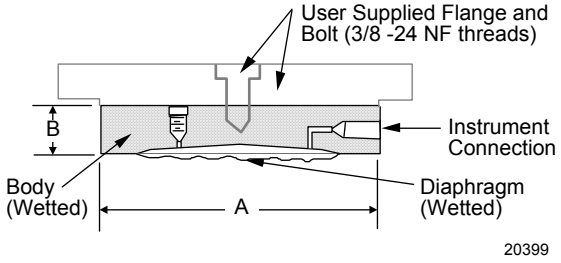


Figure 12 Pancake Seal

Type	Size	Dimension	3.5" Diaph. Dia. (in.)
Chemical Tee "Taylor Wedge" Seal	750 psi	A B	5.00 0.50

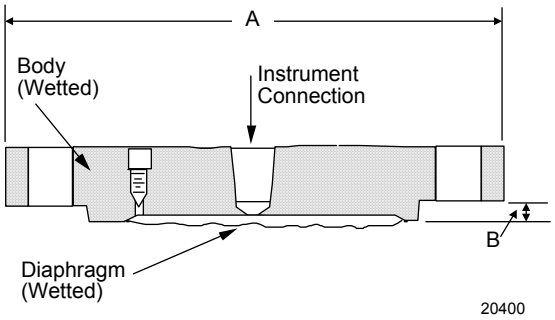


Figure 13. Chemical Tee "Taylor Wedge"

Type	Size (NPT)	Dim.	2.4" Diaph. Dia. (in.)	2.9" Diaph. Dia. (in.)	4.1" Diaph. Dia. (in.)
Seal with Threaded Process Connection	1/4" or 1/2"	A B	3.50 1.80	4.00 1.80	5.30 1.80
	3/4" or 1"	A B	3.50 2.10	4.00 2.10	5.30 2.10

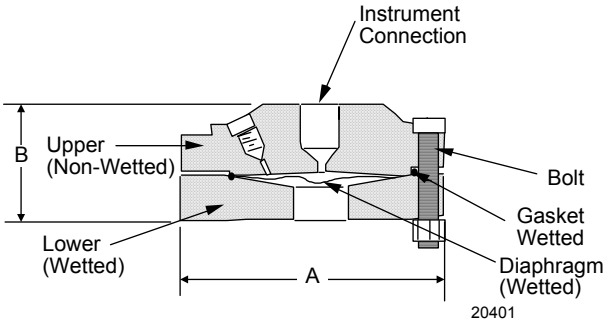


Figure 14. Seal with Threaded Process Connection

Model Selection Guide, cont.

Type	Size	Dim.	1.9" Diaph. Dia. (in.)	2.4" Diaph. Dia. (in.)	2.9" Diaph. Dia. (in.)	4.1" Diaph. Dia. (in.)
Sanitary Seal	2"	A B	2.50 1.20	— —	— —	— —
	2-1/2"	A B	— —	3.00 1.20	— —	— —
	3"	A B	— —	— —	3.60 1.20	— —
	4"	A B	— —	— —	— —	4.70 1.00

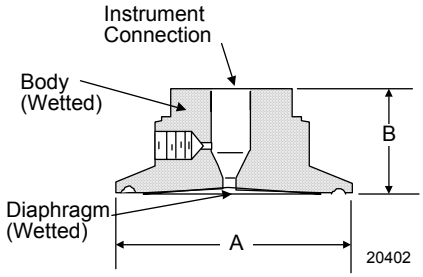


Figure 15. Sanitary Seal

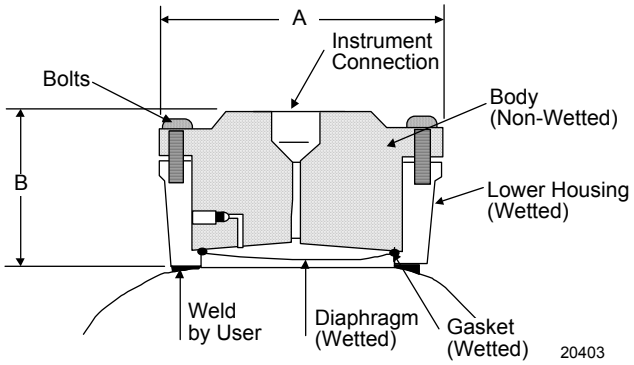


Figure 16. 3" Saddle Seal

Type	Size	Dimension	2.4" Diaph. Dia. (in.)
Saddle Seal	3"	A B	3.50 2.30
	4" or larger	A B	3.50 2.40

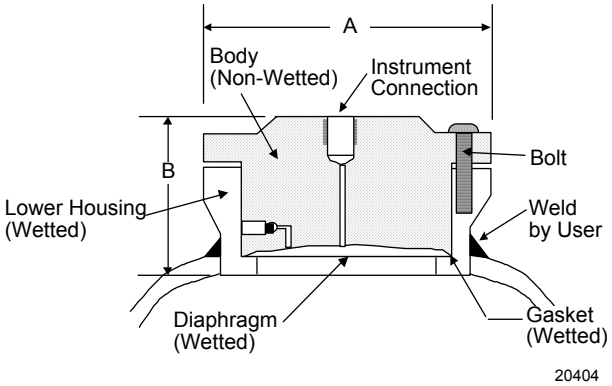


Figure 17. 4" or larger Saddle Seal

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