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
9/05

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 sensors and advanced seal technology with standard weld connections.

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."

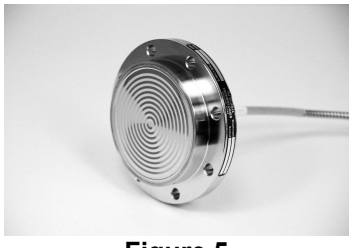
Maureen Atchison, DuPont
Site Electrical & Instrumentation Leader

Description of Diaphragm Seals

Diaphragm seals are traditionally used when a standard pressure transmitter should not be exposed to the process pressure directly. Diaphragm seals typically protect the pressure transmitter from one or more damaging aspects of the process media. Consideration for using a diaphragm seal should be made in the following circumstances.

- High Process Temperature
- Process Media is Viscous or Contains Suspended Solids
- Process Media is Subject to Solidifying
- Process Media is Corrosive
- Process Application Requires Sanitary Connections
- Process Application Subjects the Measuring Instrument to Hydrogen Permeation
- Tank Level Applications with Maintenance Intensive Wet Legs
- Tank Application with Density or Interface Measurements
- Measuring Instrument Requires Remote Mounting

The following diaphragm seals are standard from Honeywell (please call your local salesperson if you do not see the product you need for your application):

Figure 2 - Flush Flange Seals can be used with differential, gauge and absolute pressure transmitters and are available with 3” ANSI Class 150, ANSI Class 300 and DIN DN80-PN40 process connections. Flush flange seals can also be provided with Lowers. Lowers are essentially calibration rings, which allow flushing connections if needed – see Figure 31.	 **Figure 2**
Figure 3 - Flange Seal with Extended Diaphragm can be used with differential, gauge and absolute pressure transmitters and are available with 3” and 4” ANSI Class 150, ANSI Class 300, DIN DN80-PN40 and DIN DN100-PN40 process connections. 2”, 4” and 6” extension lengths are available.	 **Figure 3**
Figure 4 - Pancake Seals can be used with differential, gauge and absolute pressure transmitters and are available with 3” ANSI Class 150, 300 and 600 process connections.	 **Figure 4**
Figure 5 - Chemical Tee “Taylor” Wedge seals can be used with differential pressure transmitters and are available with Taylor Wedge 5” O.D. process connection.	 **Figure 5**

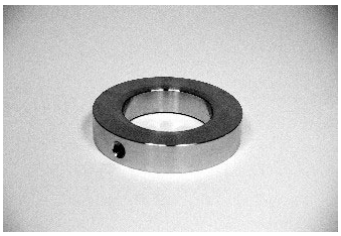
Description of Diaphragm Seals	
Figure 6 - Seals with Threaded Process Connections can be used with differential, gauge and absolute pressure transmitters and are available with ½", ¾" and 1" NPT Female process connections.	 **Figure 6**
Figure 7 - Sanitary Seals can be used with differential, gauge and absolute pressure transmitters and are available with 3" and 4" Tri-Clover-Tri-Clamp process connections.	 **Figure 7**
Figure 8 - Saddle Seals can be used with differential, gauge and absolute pressure transmitters and are available with 3" and 4" (6 bolt or 8 bolt designs) process connections.	 **Figure 8**
Figure 9 - Calibration Rings are available with Flush Flange Seals and Pancake Seals. Flushing ports (1/4" or ½") are available with calibration rings.	 **Figure 9**
Figure 10 - Stainless Steel Armor and PVC Coated Stainless Steel Armor Capillaries are available with Honeywell Remote Seal Solutions.	 **Figure 10**
Figure 11 - 2" Stainless Steel Nipples are available for Close-Coupled remote seal solutions.	 **Figure 11**

Figure 12 - Welded Meter Body for All-Welded Remote Seal Solution. The welded ST 3000 meter body is an important part of an All-Welded Remote Seal Solution, which is commonly used in Vacuum applications.	 **Figure 12**

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 13				-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 13					
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 14)							

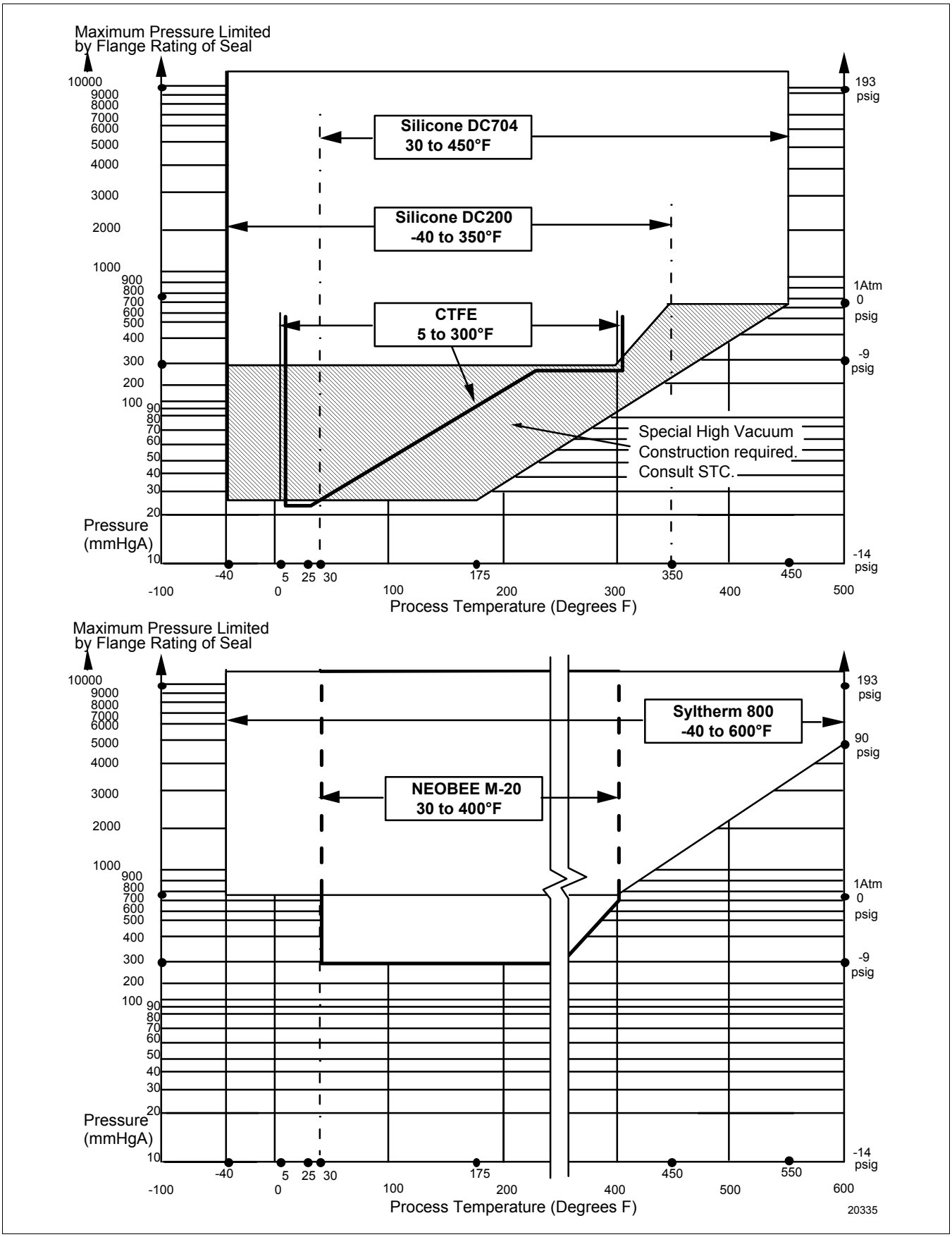


Figure 13—ST 3000 Remote Seals operable limits for pressure versus temperature

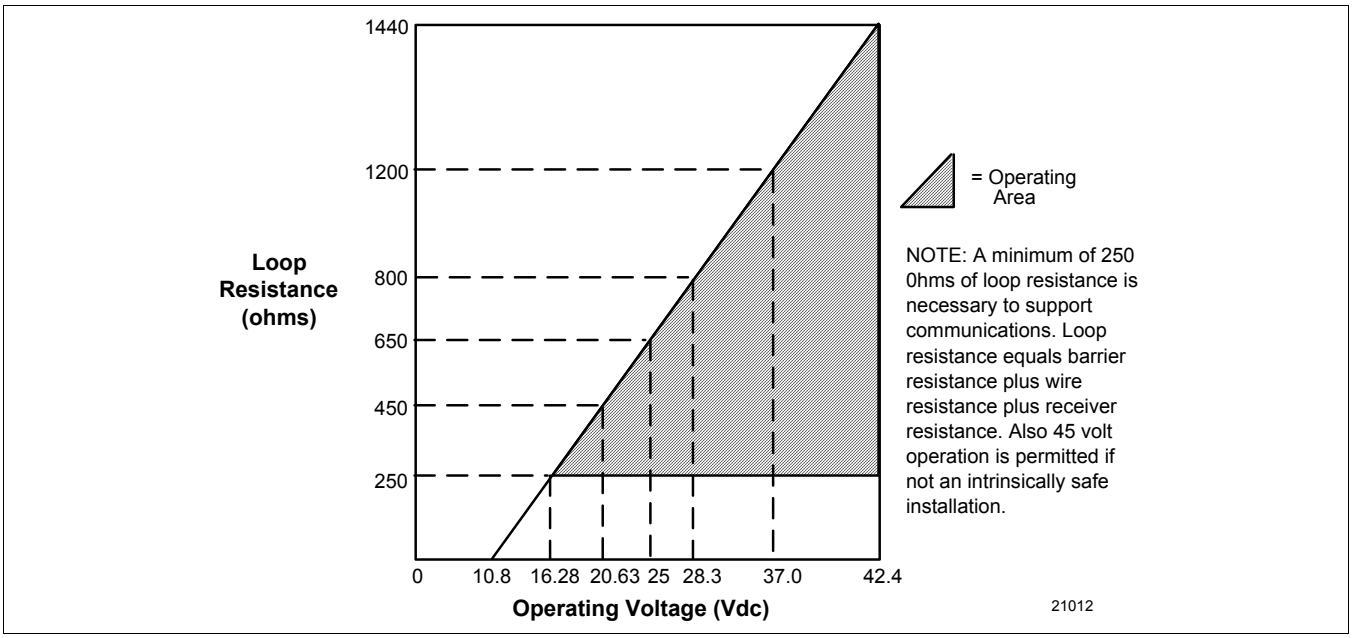


Figure 14—Supply voltage and loop resistance chart

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) **	**In Analog Mode:** ±1.5% of span. For URV below reference point (200 inH_2O), effect equals: $\pm 0.30 + 1.2 \left(\frac{200\ \text{in}\ H_2O}{\text{span in}\ H_2O} \right)$ or $\pm 0.30 + 1.2 \left(\frac{500\ \text{mbar}}{\text{span mbar}} \right)$ In % span **In Digital Mode:** ±1.475% of span. For URV below reference point (200 inH_2O), effect equals: $\pm 0.275 + 1.2 \left(\frac{200\ \text{in}\ H_2O}{\text{span in}\ H_2O} \right)$ or $\pm 0.275 + 1.2 \left(\frac{500\ \text{mbar}}{\text{span mbar}} \right)$ 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.

** Specification applies to transmitters with 2 seals only. Apply 1.5 times factor to temperature effect for capillary lengths greater than 10 feet or for 2-inch sanitary seals.

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.

* 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.

Transmitter Minimum Span and Maximum Capillary Length

Minimum recommended span for STR93D DP Transmitter with two Remote Seals

Diaphragm	Capillary							Capillary Length
Size	5'	10'	15'	20'	25'	30'	35'	maximum
2.0	15 psig	20 psig	25 psig	-	-	-	-	15'
2.4	150 iwc	200 iwc	250 iwc	300 iwc	350 iwc	400 iwc	450 iwc	35'
2.9	50 iwc	75 iwc	100 iwc	125 iwc	150 iwc	175 iwc	200 iwc	35'
3.5	25 iwc	25 iwc	25 iwc	28 iwc	32 iwc	36 iwc	40 iwc	35'
4.1	25 iwc	25 iwc	25 iwc	25 iwc	25 iwc	27 iwc	30 iwc	35'

Minimum recommended span for STR94G or STR93D DP Transmitter with one Remote Seal

Diaphragm	Direct	Capillary						Capillary Length
Size	Mount	5'	10'	15'	20'	30'	35'	maximum
2.0	25 psi	30 psi	40 psi	50 psi	-	-	-	15'
2.4	10 psi	15 psi	20 psi	25 psi	30 psi	40 psi	50 psi	35'
2.9	8 psi	9 psi	10 psi	11 psi	12 psi	14 psi	15 psi	35'
3.5	2 psi	2 psi	3 psi	4 psi	5 psi	7 psi	8 psi	35'
4.1	0.9 psi	0.9 psi	1 psi	2 psi	3 psi	4 psi	5 psi	35'

Minimum span is the higher of the value from the table above or the value defined under Performance Conditions for the range transmitter

Figure 15— Maximum capillary length and diaphragm size chart.

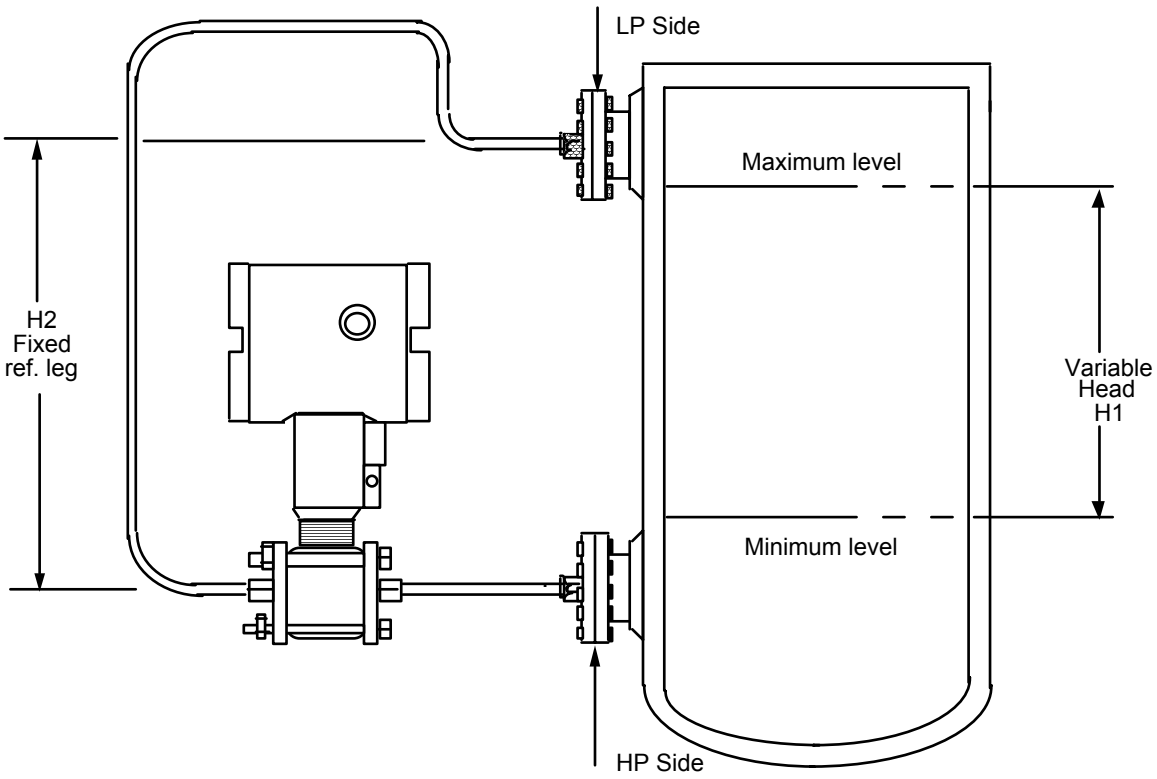
Performance Under Rated Conditions - General for all Models

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 Teflon Gylon 3510
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 16.
Dimensions	See Figures 19 and 20 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 13 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 16—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 17).

$P_{Min} = (SG_p \times a) - (SG_f \times d)$
= 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 9 for values.)

SG_p = Specific Gravity of process fluid

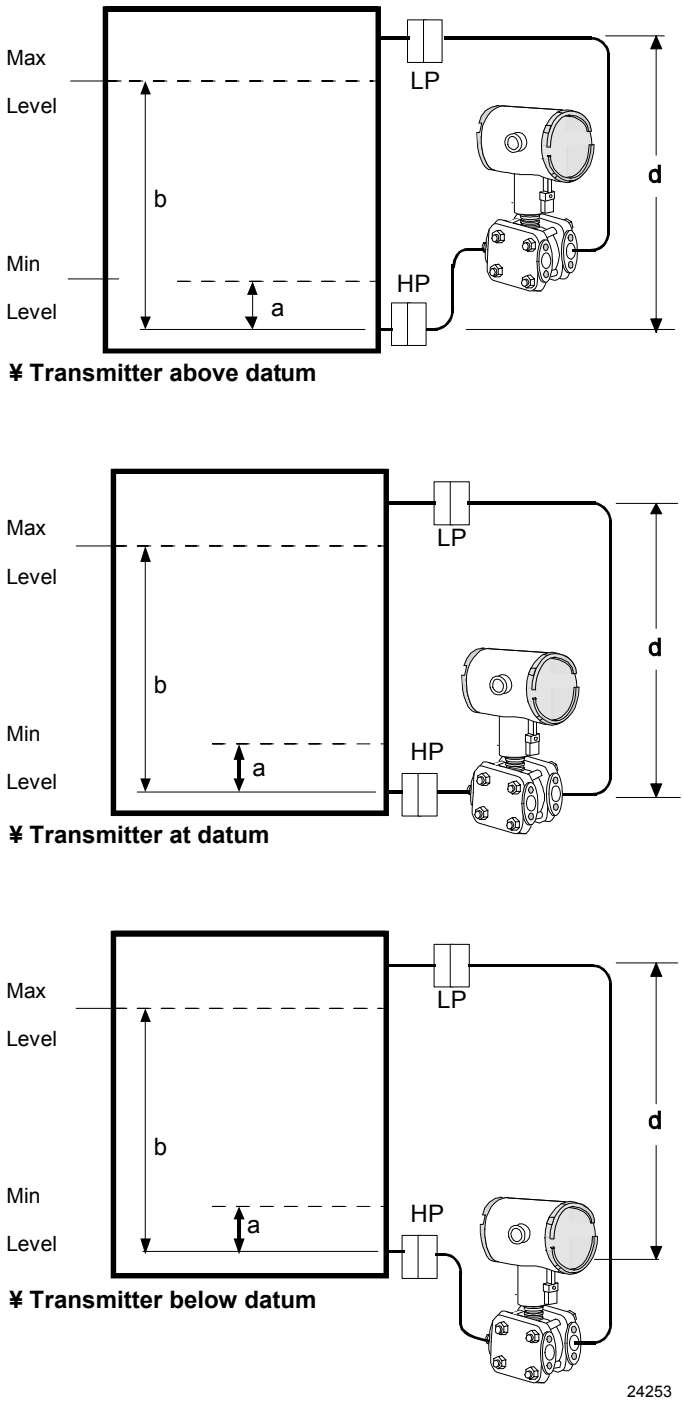


Figure 17—Closed tank liquid level measurement distances

Density or Interface
Calculate the minimum and maximum pressure differentials to be measured (Figure 18).

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

$P_{max} = (SG_{max} – SG_f) \times (d)$; 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 9 for values.)

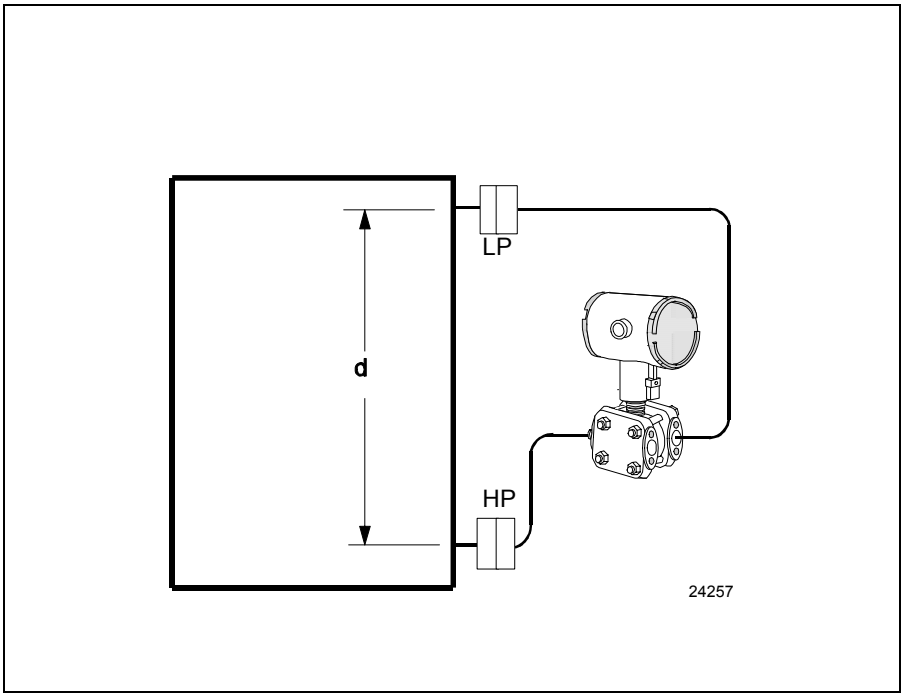
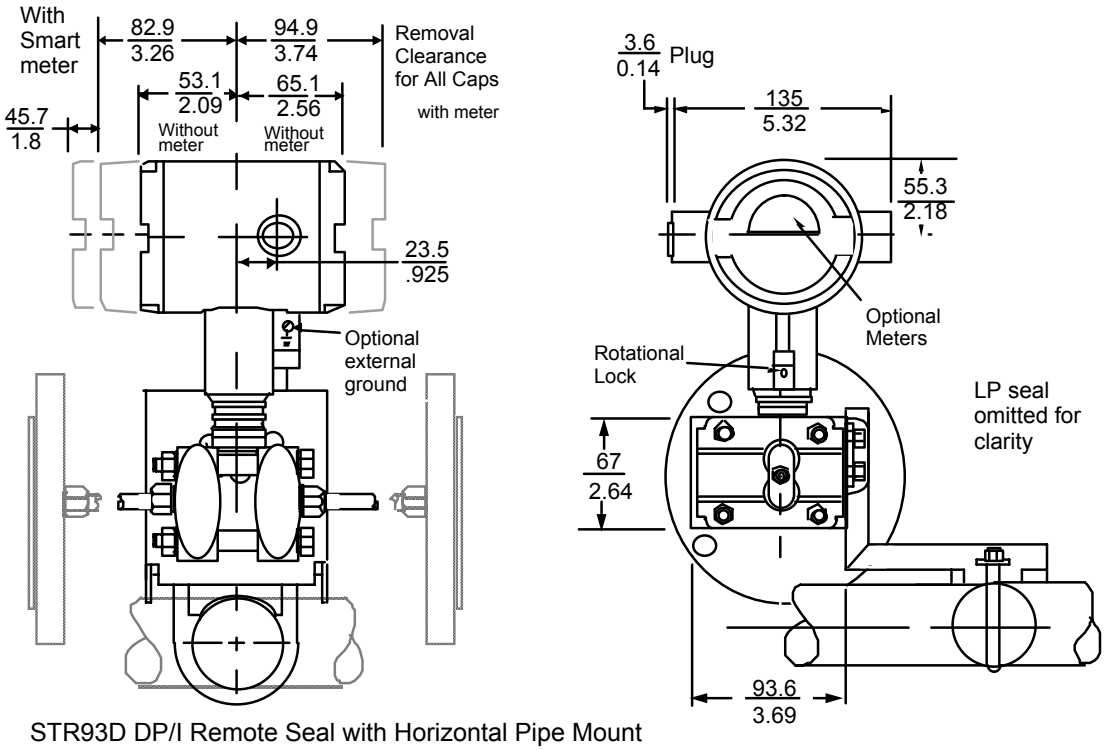
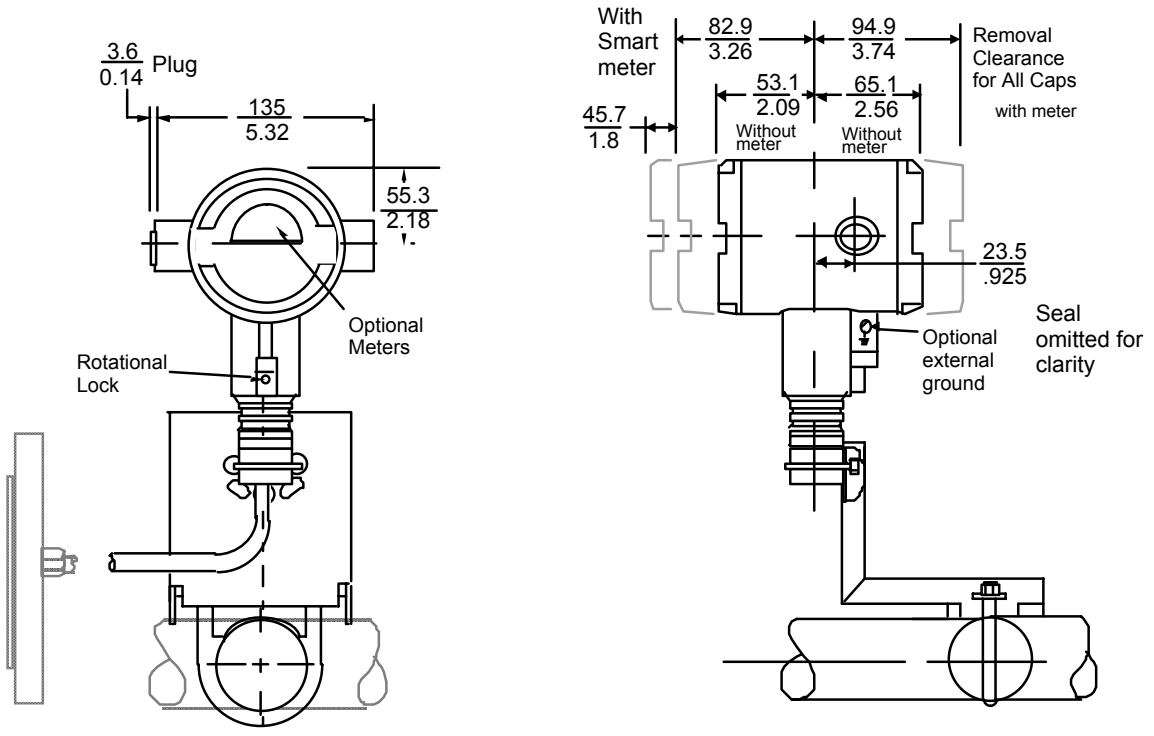


Figure 18—Density, direct acting transmitter configuration

Reference Dimensions: millimeters
Inches



STR93D DP/I Remote Seal with Horizontal Pipe Mount

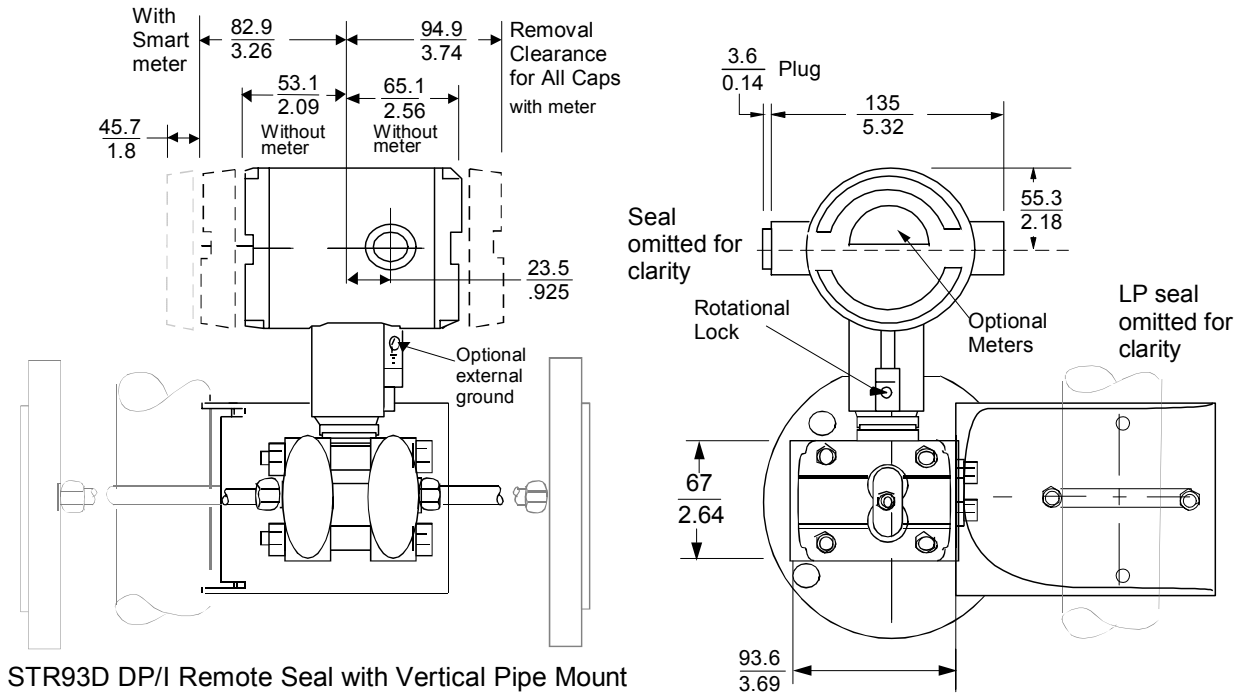


STR94G LGP/I Remote Seal with Horizontal Pipe Mount

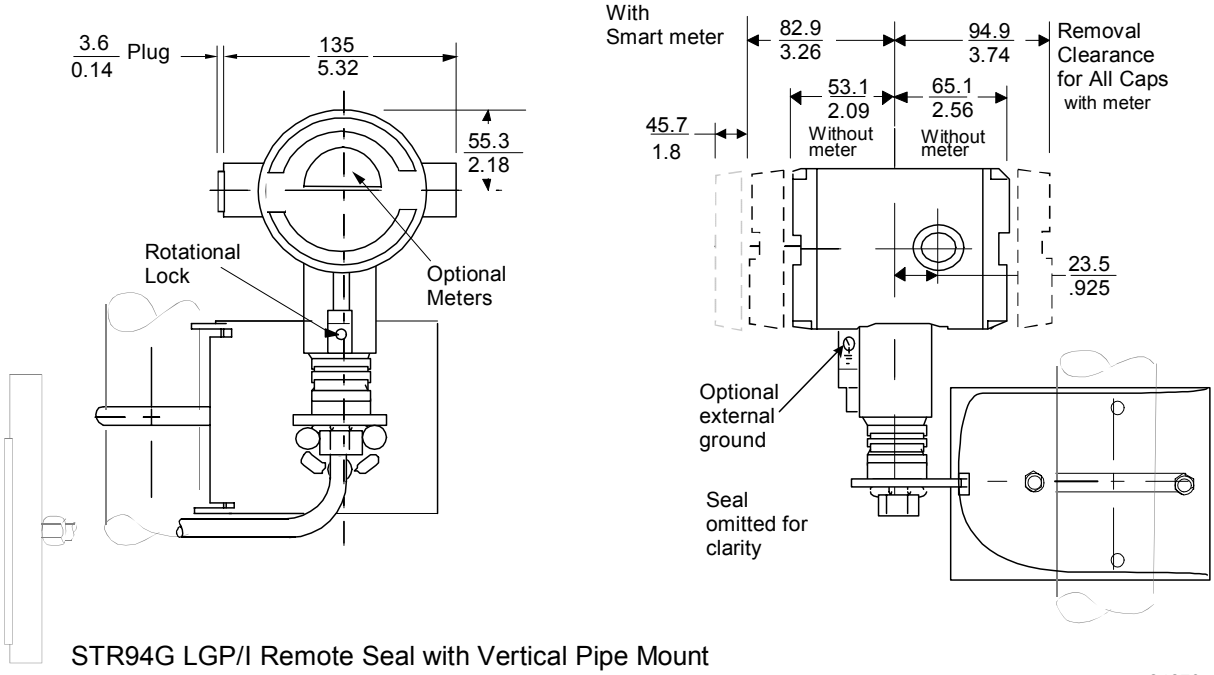
24272

Figure 19—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 20—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**

Model Selection Guide

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	Availability	
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 _ _	◆	
	Value Added Model (VAM unit)	5 _ _	**8**	**8**
Fill Fluid	Silicone (DC 200)	_ 1 _	◆	◆
(Meter Body)	CTFE	_ 2 _	**q**	**q**
Construction	**Non-Wetted Material**			
In-Line Gauge	316 St. St.	_ _ A		◆
	316 St. St. for Close-Couple	_ _ D		**y**
Dual Head DP	316 St. St. Heads	_ _ A	◆	
	316 St. St. Heads for Close-Couple connection	_ _ D	**y**	
	316 St. St. with all-welded meter body	_ _ C	**7**	

Availability

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	No Fill Fluid				0 _ _ _ _ _ _ _ _ _ _	3	3
	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	No Capillary, No Nipple				_ 0 _ _ _ _ _ _ _ _ _	3	3
	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 _ _ _ _ _ _ _ _	•	•
No Seal Attached to Core Transmitter					_ _ _ 0 0 0 0 0 0 0 0 0	3	3
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 _ _ _ _	◆	◆
			Tantalum	Tantalum[a]	_ _ _ _ _ _ AF _ _ _ _	1	1
	Flange Material		CS (Nickel Plated)		_ _ _ _ _ _ _ _ 1 _ _ _	◆	◆
			316 St. St.		_ _ _ _ _ _ _ _ 2 _ _ _	◆	◆
	Seal-Capillary Connection		Center of Seal		_ _ _ _ _ _ _ _ _ 1 _ _	◆	◆
			Side of Seal		_ _ _ _ _ _ _ _ _ 2 _ _	9	9
	Calibration Rings		None		_ _ _ _ _ _ _ _ _ _ A _	◆	◆
			316 St. St.		_ _ _ _ _ _ _ _ _ _ B _	5	5
			Hastelloy C		_ _ _ _ _ _ _ _ _ _ C _	5	5
			Monel		_ _ _ _ _ _ _ _ _ _ D _	5	5

Table II continued next page

Availability

STR9_ _

TABLE II - SEALS (continued)			**Selection**	**3D**	**4G**
	Flushing	None	_ _ _ _ _ _ _ _ _ _ _ 0	◆	◆
Flush	Connections	One 1/4" with plastic plug	_ _ _ _ _ _ _ _ _ _ _ H	6	6
Flanged	and Plugs****	One 1/4" with metal plug	_ _ _ _ _ _ _ _ _ _ _ J	6	6
Seal	(Metal plug material	Two 1/4" with plastic plugs	_ _ _ _ _ _ _ _ _ _ _ M	6	6
	will be the same as	Two 1/4" with metal plugs	_ _ _ _ _ _ _ _ _ _ _ N	6	6
	Cal. Ring material, if	One 1/2" with plastic plug	_ _ _ _ _ _ _ _ _ _ _ P	6	6
	metal plug is chosen -	One 1/2" with metal plug	_ _ _ _ _ _ _ _ _ _ _ Q	6	6
	SS Plug for CS Lower)	Two 1/2" with plastic plugs	_ _ _ _ _ _ _ _ _ _ _ R	6	6
		Two 1/2" with metal plugs	_ _ _ _ _ _ _ _ _ _ _ S	6	6

Table II continued below

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

** Limited vacuum availability.

*** Minimum static pressure requirement. No vacuum allowed. See Specification Figure 13.

**** Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

a Tantalum Upper insert has Tantalum wetted parts and 316SS or CS non-wetted parts

STR9_ _

TABLE II - SEALS (continued)	**Diaphragm Diameter**	**Flange Size**	**Flange Pressure Rating ***	**Const. - See Spec. Figure 34-ST-03-57**	**Selection**	**3D**	**4G**
	2.4"	1"	ANSI 150	22	_ _ _ BCA _ _ _ _ _ _	◆	◆
			ANSI 300	22	_ _ _ BCC _ _ _ _ _ _	◆	◆
		1-1/2"	ANSI 150	22	_ _ _ BGA _ _ _ _ _ _	◆	◆
			ANSI 300	22	_ _ _ BGC _ _ _ _ _ _	◆	◆
		2"	ANSI 150	22	_ _ _ BDA _ _ _ _ _ _	◆	◆
			ANSI 300	22	_ _ _ BDC _ _ _ _ _ _	◆	◆
		3"	ANSI 150	22	_ _ _ BFA _ _ _ _ _ _	◆	◆
			ANSI 300	22	_ _ _ BFC _ _ _ _ _ _	◆	◆
Flush	2.9"	1/2"	ANSI 150	23	_ _ _ CAA _ _ _ _ _ _	◆	◆
Flanged		1"	ANSI 150	23	_ _ _ CCA _ _ _ _ _ _	◆	◆
Seal with			ANSI 300	23	_ _ _ CCC _ _ _ _ _ _	◆	◆
Lower		1-1/2"	ANSI 150	22	_ _ _ CGA _ _ _ _ _ _	◆	◆
			ANSI 300	22	_ _ _ CGC _ _ _ _ _ _	◆	◆
		2"	ANSI 150	22	_ _ _ CDA _ _ _ _ _ _	◆	◆
			ANSI 300	22	_ _ _ CDC _ _ _ _ _ _	◆	◆
	4.1"	1/2"	ANSI 150	23	_ _ _ DAA _ _ _ _ _ _	◆	◆
		1"	ANSI 150	23	_ _ _ DCA _ _ _ _ _ _	◆	◆
			ANSI 300	23	_ _ _ DCC _ _ _ _ _ _	◆	◆
		1-1/2"	ANSI 150	23	_ _ _ DGA _ _ _ _ _ _	◆	◆
			ANSI 300	23	_ _ _ DGC _ _ _ _ _ _	◆	◆
		2"	ANSI 150	23	_ _ _ DDA _ _ _ _ _ _	◆	◆
			ANSI 300	22	_ _ _ DDC _ _ _ _ _ _	◆	◆
		3"	ANSI 150	22	_ _ _ DFA _ _ _ _ _ _	◆	◆
			ANSI 300	22	_ _ _ DFC _ _ _ _ _ _	◆	◆

Table II continued next page

TABLE II - SEALS (continued)					Selection	Availability STR9_ _ 3D	4G
			Diaphragm	**Lower**			
	Wetted Material		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 _ _ _ _	1	1
			Tantalum	Hastelloy C	_ _ _ _ _ _ BG _ _ _ _	1	1
			Tantalum	Tantalum Clad	_ _ _ _ _ _ BH _ _ _ _	k,1	k,1
	Non-Wetted		**Upper**	**Upper Insert**			
	Material (upper,		316 St. St.	316 St. St.	_ _ _ _ _ _ _ _ 4 _ _ _	◆	◆
	upper insert)		CS	316 St. St.	_ _ _ _ _ _ _ _ 5 _ _ _	◆	◆
	Bolts***		No Selection		_ _ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Flushing		None		_ _ _ _ _ _ _ _ _ _ 0 _	◆	◆
	Connections		One 1/4" with plastic plug		_ _ _ _ _ _ _ _ _ _ H _	◆	◆
	and Plugs**		One 1/4" with metal plug		_ _ _ _ _ _ _ _ _ _ J _	◆	◆
	(Metal plug material		Two 1/4" with plastic plugs		_ _ _ _ _ _ _ _ _ _ M _	◆	◆
	will be the same as		Two 1/4" with metal plugs		_ _ _ _ _ _ _ _ _ _ N _	◆	◆
	Lower material, if		One 1/2" with plastic plug		_ _ _ _ _ _ _ _ _ _ P _	◆	◆
	metal plug is chosen -		One 1/2" with metal plug		_ _ _ _ _ _ _ _ _ _ Q _	◆	◆
	(SS Plug for CS Lower		Two 1/2" with plastic plugs		_ _ _ _ _ _ _ _ _ _ R _	◆	◆
	and Tantalum Clad)		Two 1/2" with metal plugs		_ _ _ _ _ _ _ _ _ _ S _	◆	◆
	Gasket		Klinger C-4401 (non-asbestos)		_ _ _ _ _ _ _ _ _ _ _ K	c	c
			Grafoil		_ _ _ _ _ _ _ _ _ _ _ G	d	d
			Teflon		_ _ _ _ _ _ _ _ _ _ _ T	c	c
			Gylon 3510		_ _ _ _ _ _ _ _ _ _ _ L	d	d
	Diaphragm Diameter	**Flange Size**	**Flange Pressure Rating ***				
	2.8"	3" (2.8" OD extension)	ANSI Class 150		_ _ _ EFA _ _ _ _ _ _	◆	◆
			ANSI Class 300		_ _ _ EFC _ _ _ _ _ _	◆	◆
			DIN DN80-PN40		_ _ _ EFM _ _ _ _ _ _	◆	◆
Flange	3.5"	4" (3.70" OD extension)	ANSI Class 150		_ _ _ FGA _ _ _ _ _ _	◆	◆
Seal with			ANSI Class 300		_ _ _ FGC _ _ _ _ _ _	◆	◆
Extended			DIN DN100-PN40		_ _ _ FGP _ _ _ _ _ _	◆	◆
Diaphragm			**Diaphragm**	**Ext. Tube**			
	Wetted Material		316L SS	316 St. St.	_ _ _ _ _ _ EA _ _ _ _	◆	◆
			Hastelloy C	316 St. St.	_ _ _ _ _ _ EB _ _ _ _	◆	◆
			Hastelloy C	Hastelloy C	_ _ _ _ _ _ EC _ _ _ _	◆	◆
	Flange Material		CS (Nickel Plated)		_ _ _ _ _ _ _ _ 7 _ _ _	◆	◆
			316 SS		_ _ _ _ _ _ _ _ 8 _ _ _	◆	◆
	Bolts		No Selection		_ _ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Extension		2"		_ _ _ _ _ _ _ _ _ _ 2 _	◆	◆
	Length		4"		_ _ _ _ _ _ _ _ _ _ 4 _	◆	◆
			6"		_ _ _ _ _ _ _ _ _ _ 6 _	◆	◆
			No Selection		_ _ _ _ _ _ _ _ _ _ 0	◆	◆

Table II continued next page

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

** Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

*** Bolt material will be same as Upper Material. However, if Table 3 bolt/nut option chosen, seal bolt material will be the same.

TABLE II - SEALS (continued)					STR9_ _ Selection	3D	4G
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 _ _ _ _	◆	◆
			Tantalum	Tantalum[a]	_ _ _ _ _ _ GG _ _ _ _	1	1
	Non-Wetted Material		No Selection		_ _ _ _ _ _ _ _ 0 _ _ _	◆	◆
			No Selection		_ _ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Calibration Rings		None		_ _ _ _ _ _ _ _ _ _ A _	◆	◆
			316 St. St.		_ _ _ _ _ _ _ _ _ _ B _	5	5
			Hastelloy C		_ _ _ _ _ _ _ _ _ _ C _	5	5
			Monel		_ _ _ _ _ _ _ _ _ _ D _	5	5
	Flushing Connections and Plugs*** (Metal plug material will be the same as Cal. Ring material, if metal plug is chosen - SS Plug for CS Lower)		None		_ _ _ _ _ _ _ _ _ _ _ 0	◆	◆
			One 1/4" with plastic plug		_ _ _ _ _ _ _ _ _ _ _ H	6	6
			One 1/4" with metal plug		_ _ _ _ _ _ _ _ _ _ _ J	6	6
			Two 1/4" with plastic plugs		_ _ _ _ _ _ _ _ _ _ _ M	6	6
			Two 1/4" with metal plugs		_ _ _ _ _ _ _ _ _ _ _ N	6	6
			One 1/2" with plastic plug		_ _ _ _ _ _ _ _ _ _ _ P	6	6
			One 1/2" with metal plug		_ _ _ _ _ _ _ _ _ _ _ Q	6	6
			Two 1/2" with plastic plugs		_ _ _ _ _ _ _ _ _ _ _ R	6	6
			Two 1/2" with metal plugs		_ _ _ _ _ _ _ _ _ _ _ S	6	6

Table II continued below

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

a Tantalum Body has Tantalum wetted parts and 316SS non-wetted parts

*** Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

TABLE II - SEALS (continued)					STR9_ _ Selection	3D	4G
Chemical Tee "Taylor" Wedge	Diaphragm Diameter	Flange Size	Flange Pressure Rating				
	3.5"	Taylor Wedge 5" O.D.	750 psi		_ _ _ HM0 _ _ _ _ _ _	v	
	Wetted Material		Diaphragm	Body			
			316L SS	316 St. St.	_ _ _ _ _ _ HA _ _ _ _	◆	
			Hastelloy C	316 St. St.	_ _ _ _ _ _ HB _ _ _ _	◆	
			Hastelloy C	Hastelloy C	_ _ _ _ _ _ HC _ _ _ _	◆	
	Non-Wetted Material		No Selection		_ _ _ _ _ _ _ _ 0 _ _ _	◆	
	Bolts		No Selection		_ _ _ _ _ _ _ _ _ 0 _ _	◆	
	Styles		No Selection		_ _ _ _ _ _ _ _ _ _ 0 _	◆	
			No Selection		_ _ _ _ _ _ _ _ _ _ _ 0	◆	

Table II continued next page

TABLE II - SEALS (continued)

					Selection	Availability STR9_ _ 3D	4G
Seal with Threaded Process Connection	Diaphragm Diameter	Threaded Process Connection Size (NPT Female)	Seal Pressure Rating *	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	Selection	3D	4G
Seal with Threaded Process Connection	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 _ _ _ _	1	1
		Tantalum	Hastelloy C.	_ _ _ _ _ _ JG _ _ _ _	1	1
	Non-Wetted Material (upper)	CS (Nickel Plated)		_ _ _ _ _ _ _ _ A _ _ _	◆	◆
		Stainless Steel		_ _ _ _ _ _ _ _ C _ _ _	w	w
	Bolts***	C.S.		_ _ _ _ _ _ _ _ _ C _ _	1	1
		304 St. St.		_ _ _ _ _ _ _ _ _ D _ _	◆	◆
	Flushing Connections and Plugs** (Metal plug material will be the same as Lower material, if metal plug is chosen - (SS Plug for CS Lower and Tantalum Clad)	None		_ _ _ _ _ _ _ _ _ _ 0 _	◆	◆
		One 1/4" with plastic plug		_ _ _ _ _ _ _ _ _ _ H _	◆	◆
		One 1/4" with metal plug		_ _ _ _ _ _ _ _ _ _ J _	◆	◆
		Two 1/4" with plastic plugs		_ _ _ _ _ _ _ _ _ _ M _	◆	◆
		Two 1/4" with metal plugs		_ _ _ _ _ _ _ _ _ _ N _	◆	◆
		One 1/2" with plastic plug		_ _ _ _ _ _ _ _ _ _ P _	10	10
		One 1/2" with metal plug		_ _ _ _ _ _ _ _ _ _ Q _	10	10
		Two 1/2" with plastic plugs		_ _ _ _ _ _ _ _ _ _ R _	10	10
		Two 1/2" with metal plugs		_ _ _ _ _ _ _ _ _ _ S _	10	10
	Gasket	Klinger C-4401 (non-asbestos)		_ _ _ _ _ _ _ _ _ _ K	c	c
		Grafoil		_ _ _ _ _ _ _ _ _ _ G	d	d
		Teflon		_ _ _ _ _ _ _ _ _ _ T	c	c
		Gylon 3510		_ _ _ _ _ _ _ _ _ _ L	d	d

* 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.

Table II continued next page

** Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

*** If Table 3 Bolt/Nut option is chosen, Seal bolts will ship as same material

TABLE II - SEALS (continued)

					STR9_ _ 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" **8-Bolt** Design	for 3" Pipe = or > 4" pipe	1500 psi	1500 psi	_ _ _ RFK _ _ _ _ _ _ _ _ _ RGK _ _ _ _ _ _	◆ ◆	◆ ◆
	2.4" **6-Bolt** Design	for 3" Pipe = or > 4" pipe	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 _ _ _ _	◆	◆
			Hastelloy C	Hastelloy C	_ _ _ _ _ _ RD _ _ _ _	◆	◆
			316 LSS	N/A-Body Only	_ _ _ _ _ _ SB _ _ _ _	◆	◆
			Hastelloy C	N/A-Body Only	_ _ _ _ _ _ SC _ _ _ _	◆	◆
	Non-Wetted Material		**Body**	**Bolts ***			
			C. S.	C. S.	_ _ _ _ _ _ _ _ B _ _ _	1	1
			316 St. St.	304 St. St.	_ _ _ _ _ _ _ _ C _ _ _	◆	◆
	No Selection				_ _ _ _ _ _ _ _ _ 0 _ _	◆	◆
	Styles		No Selection		_ _ _ _ _ _ _ _ _ _ 0 _	◆	◆
	Gasket		Klinger C-4401 (non-asbestos)		_ _ _ _ _ _ _ _ _ _ _ K	◆	◆
			Grafoil		_ _ _ _ _ _ _ _ _ _ _ G	◆	◆
			Teflon		_ _ _ _ _ _ _ _ _ _ _ T	◆	◆
			Gylon 3510		_ _ _ _ _ _ _ _ _ _ _ L	◆	◆

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

** 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.

*** If Table 3 Bolt/Nut option is chosen, Seal bolts will ship as same material

TABLE III - OPTIONS	Selection	STR9_ _ 3D	4G	
None	00	◆	◆	
Communication Options				
HART® Protocol Compatible Electronics	HC	e	e	b
FOUNDATION Fieldbus Communications	FF	r	r	
Indicating Meter Options				
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	
Transmitter Housing & Electronics Options				
Lightning Protection	LP	◆	◆	
Custom Calibration and I.D. in Memory	CC	◆	◆	
Transmitter Configuration	TC	◆	◆	
Write Protection	WP	◆	◆	
316 ST.ST. Electronics Housing - *with M20 Conduit Connections*	SH	n	n	b
1/2" NPT to M20 316SS Conduit Adapter (BASEEFA EEx d IIC)	A1	n	n	
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	
Stainless Steel Customer Wired-On Tag (4 lines, 28 characters per line, customer supplied information)	TG	◆	◆	
Stainless Steel Customer Wired-On Tag (blank)	TB	◆	◆	
End Cap Live Circuit Warning Label in Spanish (only with ATEX 3D)	SP	a	a	b
End Cap Live Circuit Warning Label in Portuguese (only with ATEX 3D)	PG	a	a	
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	
Meter Body Options (Seal bolt material depends on Transmitter bolt material)				
A286SS (NACE) Bolts and 304SS (NACE) Nuts for Heads	CR	◆		b
316 SS Bolts and 316 SS Nuts for Process Heads	SS	◆		
B7M Bolts and Nuts for Process Heads	B7	◆		
Remote Seal Options				
Gold Plated Seal Diaphragm (1 Seal)	G1	j	j	b
Gold Plated Seal Diaphragm (2 Seals)	G2	j		
Teflon Coated Seal Diaphragm (1 Seal) - only for anti-sticking	N1	j	j	
Teflon Coated Seal Diaphragms(2 Seals) - only for anti-sticking	N2	j		
Transmitter Mounting Brackets Options				
Mounting Bracket - Carbon Steel	MB	◆	◆	b
Mounting Bracket - ST. ST.	SB	◆	◆	
Flat Mounting Bracket	FB	◆	◆	
Services/Certificates Options				
Clean Transmitter & Seals for Oxygen or Chlorine Service with Certificate	0X	h	h	
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	◆	
Marine Type Approvals (DNV, ABS, BV & LR)	MT	2	2	
Warranty Options				
Additional Warranty - 1 year	W1	◆	◆	b
Additional Warranty - 2 years	W2	◆	◆	
Additional Warranty - 3 years	W3	◆	◆	
Additional Warranty - 4 years	W4	◆	◆	

Table III continued next page

TABLE III - OPTIONS (continued)

Approval Body	Approval Type	Location or Classification	Selection	STR9_ _ 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	◆	◆
	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 1 G EEx ia IIC T4, T5,T6	3S	◆	◆
	Flameproof, Zone 1	Ex II 1 G EEx d IIC T5, T6, Enclosure IP 66/67	3D	◆	◆
	Non-Sparking, Zone 2	Ex II 3 G 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	◆	◆

b

*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 Letter	Available Only With		Not Available With	
	Table	Selection	Table	Selection
a	III	3D or 3H		
b	Select only one option from this group			
c			II	_ _ _ _ _ _ BF _ _ _ _, _ _ _ _ _ _ BG _ _ _ _, _ _ _ _ _ _ BH _ _ _ _, _ _ _ _ _ _ JF _ _ _ _, _ _ _ _ _ _ JG _ _ _ _,
d	II	_ _ _ _ _ _ BF _ _ _ _, _ _ _ _ _ _ BG _ _ _ _, _ _ _ _ _ _ JF _ _ _ _, _ _ _ _ _ _ JG _ _ _ _,		
e			III	4G
g	II	_ A _ _ _ _ _ _ _ _ _ _, _ B _ _ _ _ _ _ _ _ _ _, _ C _ _ _ _ _ _ _ _ _ _, _ G _ _ _ _ _ _ _ _ _ _, _ H _ _ _ _ _ _ _ _ _ _, _ J _ _ _ _ _ _ _ _ _ _, _ 2 _ _ _ _ _ _ _ _ _ _,		
h	I, II	_ 2 _ - 2 _ _ _ _ _ _ _ _ _ _ _		
i	III	1C or 2J		
j			II	_ _ _ _ _ _ AF _ _ _ _ _ _ _ _ _ _ BF _ _ _ _ _ _ _ _ _ _ BG _ _ _ _ _ _ _ _ _ _ BH _ _ _ _ _ _ _ _ _ _ GG _ _ _ _ _ _ _ _ _ _ JF _ _ _ _ _ _ _ _ _ _ JG _ _ _ _
k	II	_ _ _ _ _ _ _ _ _ _ 0 _	II	_ _ _ _ _ _ _ _ _ _ _ T
m	III	SM		
n			III	1C, 2J
o	III	CR		
p			II	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 _ _ _
q	II	0 _ _ _ _ _ _ _ _ _ _ _, 2 _ _ _ _ _ _ _ _ _ _ _, 4 _ _ _ _ _ _ _ _ _ _ _		
r			III	TC, ME, 4G, 3S
s			III	FF, ME

Restrictions continued next page

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			III	MB, SB, FB
				DC704 and Sylltherm 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 _ _ _
			I	2 _ _
			II	_ A - M _ _ _ _ _ _ _ _ _ _
z	I	_ _ D		
1			III	F7
2			III	FB
3	I	5 _ _, 1 _ _		
5			II	_ _ _ _ _ _ _ _ _ _ _ 0
6			II	_ _ _ _ _ _ _ _ _ _ A _
7			I	1 _ _, 3 _ _
8			III	CC,G1,G2,T1,T2,OX,TP,MT,WP
9	II	_ _ _ _ _ _ AA2_ _ _ _ _ _ _ _ _ AB2_ _ _		
10			II	_ _ _ _ _ _JJG_ _ _ _ _ _ _ _ _JKG_ _ _ _ _ _ _ _ _JLG_ _ _ _ _ _ _ _ _CAA_ _ _ _ _ _ _ _ _CCA_ _ _ _ _ _ _ _ _CCC_ _ _

Note: See ST-83 for Published Specials with pricing.
See ST-89 and User's Manual for part numbers.
See COMS 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.

Dimensions and drawings

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	All	All	**21a**	7.50	1.08
		SS	316L SS	N/A	**21b**	7.50	0.94
			Hast C	SS	**21b**		0.94
			Hast C	Hast C	**21a**		1.08
			Monel	Monel	**21a**		1.08
			Tantalum	Tantalum	**21a**		1.08
	3" 300	CS	All	All	**21a**	8.25	1.26
		SS	316L SS	N/A	**21b**	8.25	1.12
			Hast C	SS	**21b**		1.12
			Hast C	Hast C	**21a**		1.26
			Monel	Monel	**21a**		1.26
			Tantalum	Tantalum	**21a**		1.26
	3" 600	CS	All	All	**21a**	8.25	1.50
		SS	316L SS	N/A	**21b**	8.25	1.50
			Hast C	SS	**21b**		1.50
			Hast C	Hast C	**21a**		1.50
			Monel	Monel	**21a**		1.50
			Tantalum	Tantalum	**21a**		1.50
	DN80-PN40	CS	All	All	**21a**	7.87	1.02
		SS	316L SS	N/A	**21b**	7.87	0.94
			Hast C	SS	**21b**		0.94
			Hast C	Hast C	**21a**		1.02
			Monel	Monel	**21a**		1.02
			Tantalum	Tantalum	**21a**		1.02

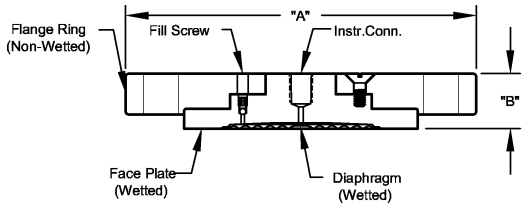


Figure 21a. Flush Flanged Seal

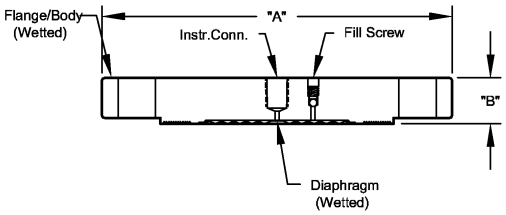


Figure 21b. Flush Flanged Seal

Dimensions and drawings, 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	□ 5.25
			B0	□ 1.72	□ 1.72	□ 1.84
			B1	□ 1.72	□ 1.72	□ 1.84
			B2	□ 2.22	□ 2.22	□ 2.34
		1"	A	○ 4.25	□ 4.00	□ 5.25
			B0	○ 1.12	□ 1.72	□ 1.84
			B1	○ 1.62	□ 1.72	□ 1.84
			B2	○ 1.98	□ 2.22	□ 2.34
		1-1/2"	A	○ 5.00	○ 5.00	□ 5.25
			B0	○ 1.17	○ 1.72	□ 1.78
			B1	○ 1.67	○ 1.72	□ 2.12
			B2	○ 2.02	○ 2.22	□ 2.12
		2"	A	○ 6.00	○ 6.00	□ 6.00
			B0	○ 1.34	○ 1.34	□ 2.12
			B1	○ 1.84	○ 1.84	□ 2.12
			B2	○ 2.34	○ 2.34	□ 2.12
		3"	A	○ 7.50	○ 7.50	○ 7.50
			B0	○ 1.53	○ 1.53	○ 1.63
			B1	○ 2.03	○ 2.03	○ 2.03
			B2	○ 2.53	○ 2.53	○ 2.43
	300#	1"	A	○ 4.88	□ 4.00	□ 5.25
			B0	○ 1.27	□ 1.72	□ 1.88
			B1	○ 1.77	□ 1.72	□ 2.12
			B2	○ 2.27	□ 2.22	□ 2.12
		1-1/2"	A	○ 6.12	○ 6.12	□ 5.25
			B0	○ 1.40	○ 1.40	□ 2.12
			B1	○ 1.90	○ 1.96	□ 2.12
			B2	○ 2.40	○ 2.46	□ 2.12
		2"	A	○ 6.50	○ 6.50	○ 6.50
			B0	○ 1.47	○ 1.47	○ 1.67
			B1	○ 1.97	○ 1.97	○ 2.17
			B2	○ 2.47	○ 2.47	○ 2.47
		3"	A	○ 8.25	○ 8.25	○ 8.25
			B0	○ 2.09	○ 2.09	○ 1.81
			B1	○ 2.21	○ 2.21	○ 2.21
			B2	○ 2.61	○ 2.61	○ 2.61
	600#	1"	A	○ 4.88	□ 4.50	○ 5.25
			B0	○ 1.84	□ 2.15	○ 2.26
			B1	○ 1.84	□ 2.15	○ 2.26
			B2	○ 2.34	□ 2.40	○ 2.50
		1-1/2"	A	○ 6.12	○ 6.12	○ 5.25
			B0	○ 1.78	○ 1.53	○ 2.39
			B1	○ 2.03	○ 2.09	○ 2.39
			B2	○ 2.53	○ 2.49	○ 2.50
		2"	A	○ 6.50	○ 6.50	○ 6.50
			B0	○ 1.65	○ 1.65	○ 1.85
			B1	○ 2.15	○ 2.15	○ 2.25
			B2	○ 2.65	○ 2.65	○ 2.63
		3"	A	○ 8.25	○ 8.25	○ 8.25
			B0	○ 2.28	○ 2.28	○ 2.28
			B1	○ 2.40	○ 2.40	○ 2.40
			B2	○ 2.80	○ 2.80	○ 2.80

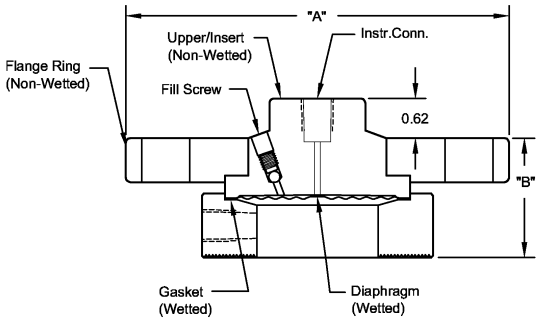


Figure 22 Flush Flanged Seal with Lower

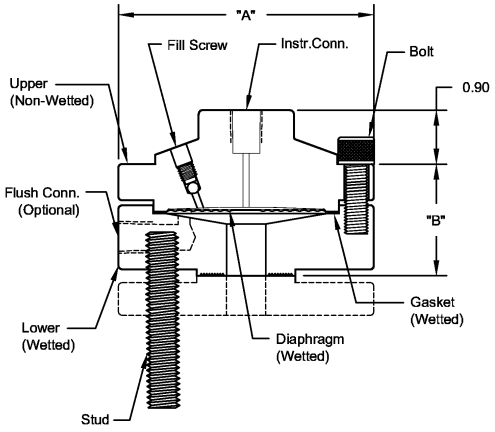


Figure 23 Flush Flanged Seal with Lower

Note: 0.90 Dimension is 0.70 for 4.1 Dia. Diaphragm

B0 = Without Flush
B1 = B Dimension With 1/4 NPT Flush
B2 = B Dimension With 1/2 NPT Flush

Dimensions and drawings, cont.

Type	Size	Dim.	2.8" Diaph. Dia. (in.)	3.5" Diaph. Dia. (in.)
Flanged Seal With Extended Diaphragam	3" 150	A	7.50	-
		B	0.94	-
		C	2.80	-
	3" 300	A	8.25	-
		B	1.12	-
		C	2.80	-
	DIN DN80-PN40	A	7.87	-
		B	0.94	-
		C	2.80	-
	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

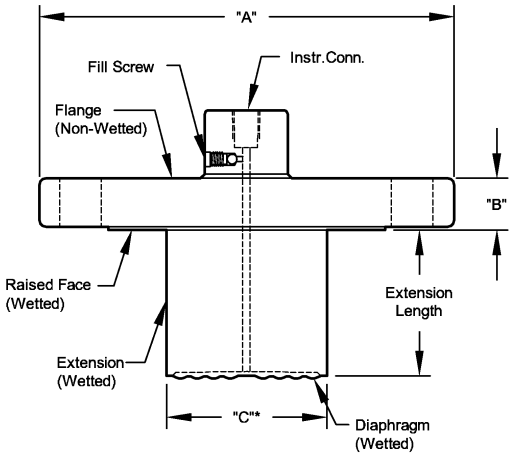


Figure 24 Flange Extended Seal

Type	Size	Dimension	3.5" Diaph. Dia. (in.)
Pancake Seal	150/300/600	A	5.00
		B	1.08

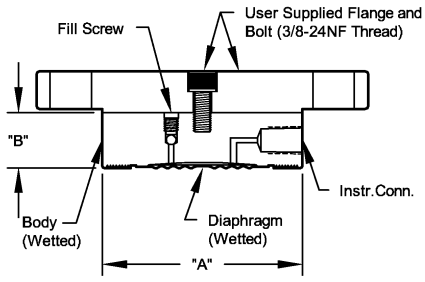


Figure 25 Pancake Seal

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

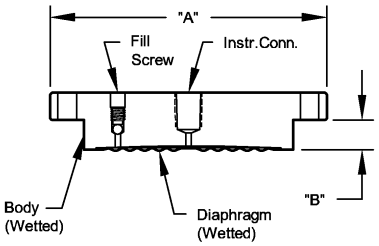


Figure 26 Chemical Tee "Taylor Wedge"

Dimensions and drawings, cont.

Type	Size	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	3.50	4.00	5.25
		B0	1.66	1.66	1.79
		B1	1.66	1.66	1.79
		B2	2.16	2.16	2.14
	3/4" or 1"	A	3.50	4.00	5.25
		B0	1.66	1.66	1.79
		B1	1.66	1.66	1.79
		B2	2.16	2.16	2.14

B0 = B dimension for No Flush
B1 = B dimension for 1/4 NPT
B2 = B dimension for 1/2 NPT

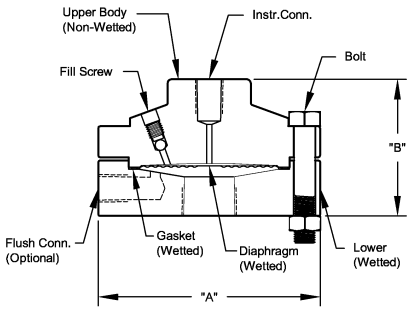


Figure 27 **Threaded Process Connection**

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	2.50	-	-	-
		B	1.42	-	-	-
	2-1/2"	A	-	3.00	-	-
		B	-	1.28	-	-
	3"	A	-	-	3.57	-
		B	-	-	1.38	-
	4"	A	-	-	-	4.68
		B	-	-	-	1.60

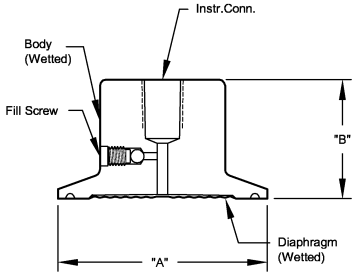


Figure 28 **Sanitary Seal**

Dimensions and drawings, cont.

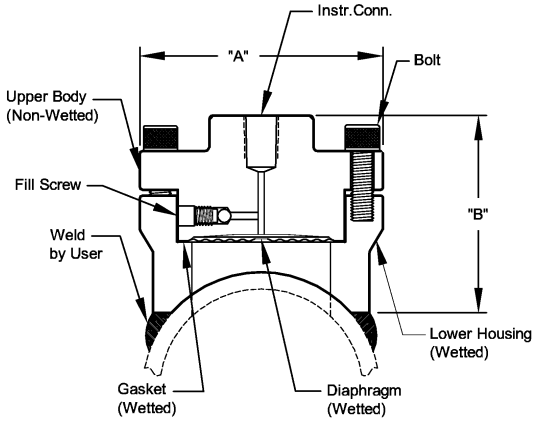


Figure 29 3" Saddle Seal

Type	Size	Dimension	2.4" Diaph. Dia.
Saddle Seal	3"	A	3.50
		B	2.90
	4" or larger	A	3.50
		B	3.04

Note: Specify 6 or 8 Bolt Pattern

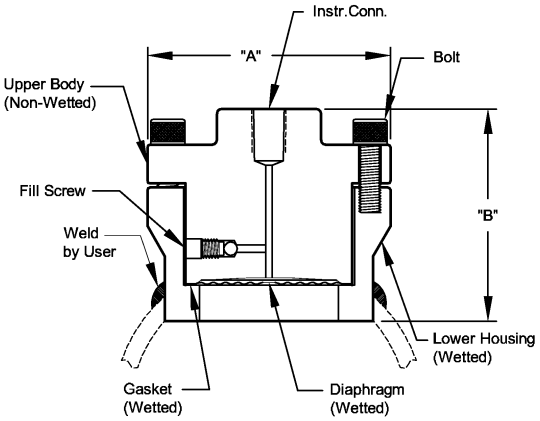


Figure 30 4" or larger Saddle Seal

SIZE	RATING	DIM.	1/4 NPT	1/2 NPT
3"	150/600#	A	5.00	5.00
		B	1.00	1.50
		C	3.00	3.00

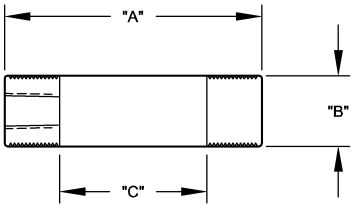


Figure 31 Calibration Ring

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Industrial Measurement and Control
Honeywell International Inc.
2500 W. Union Hill Drive
Phoenix, Arizona 85027