

# ST 3000 Smart Transmitter Series 900 Remote Diaphragm Seals Models Specifications 34-ST-03-57 August 2011



## 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.



**Figure 1**—Series 900 Remote Seal Pressure Transmitters feature proven piezoresistive sensors and advanced seal technology with standard weld connections.

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

All ST 3000 transmitters can be ordered to provide one of the following output communication options.

Communications options
4-20 mA
Honeywell Digitally Enhanced (DE)
HART® (versions 5.x or 6.x)
FOUNDATION™ Fieldbus

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.

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 ST3000 S900 transmitters lead the industry in reliability and stability:

- Stability
- Reliability

### ST3000 S900 Transmitter Benefits

Stability = ±0.01% per year

Reliability = 470 years MTBF

## 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

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.



**Figure 3**—Flange Seal with Extended Diaphragm

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 4**—Pancake Seals

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 5**—Chemical Tee "Taylor" Wedge

Chemical Tee "Taylor" Wedge seals can be used with differential pressure transmitters and are available with Taylor Wedge 5" O.D. process connection.



**Figure 6**—Seals with Threaded Process Connections

Seals with Threaded Process Connections can be used with differential, gauge and absolute pressure transmitters and are available with 1/2", 3/4" and 1" NPT Female process connections.



**Figure 7**— Sanitary Seals

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 8**— Saddle Seals

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 9**— Calibration Rings

Calibration Rings are available with Flush Flange Seals and Pancake Seals. Flushing ports (1/4" or 1/2") are available with calibration rings.



**Figure 10**— Stainless Steel Armor and PVC Coated Stainless Steel Armor Capillaries

Stainless Steel Armor and PVC Coated Stainless Steel Armor Capillaries are available with Honeywell Remote Seal Solutions.



**Figure 11**— 2" Stainless Steel Nipples

2" Stainless Steel Nipples are available for Close-Coupled remote seal solutions.



**Figure 12**— Welded Meter Body for All-Welded Remote Seal Solution

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.

## 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 uses a differential pressure sensor, a temperature sensor and a static pressure sensor in delivering the most comprehensive compensated output signal available today.

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 transmitters.

## 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 real-world temperature and static pressure variations.
- 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.
- ST 3000 transmitters feature full Dual-Seal certification based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.01 requirements without the use of additional seal protection elements.
- ST 3000 transmitters are available fully compliant to SIL 2/3 requirements as a standard option.

## Advanced Diagnostics

ST 3000 is now available for both HART® 6 and Foundation™ Fieldbus with advanced diagnostics that minimize unplanned plant outages, minimize maintenance costs and by providing the industry's most reliable transmitter.

- Provide advanced warning of possible failure events and avoid costly shutdowns.
- Three levels of failure reporting
- Comprehensive list of on-board diagnostics (Ref. ST 3000 User manual with HART® 6, 34-ST-25-17 Rev: June 09 and Foundation™ Fieldbus option manual 34-ST-25-15 Rev: June 09)

**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						
<b>Ambient Temperature</b>	25±1	77±2	-25 to 70	-13 to 158	-40 to 85	-40 to 185	-55 to 125	-67 to 257						
<b>Process Interface Temperature</b>	25±1	77±2	See Figure 13				-55 to 125	-67 to 257						
<b>Humidity</b> %RH	10 to 55		0 to 100		0 to 100		0 to 100							
<b>Vacuum Region, Minimum Pressure</b> mmHg absolute inH <sub>2</sub> O absolute	Atmospheric Atmospheric		See Figure 13											
<b>Supply Voltage, Current, and Load Resistance</b>	<b>Voltage Range:</b> 10.8 to 42.4 Vdc at terminals <b>Current Range:</b> 3.0 to 21.8 mA <b>Load Resistance:</b> 0 to 1,440 ohms (as shown in Figure 14)													
<b>Maximum Allowable Working Pressure (MAWP)<sup>4</sup></b> (ST 3000 products are rated to Maximum Allowable Working Pressure. MAWP depends on Approval Agency and transmitter materials of construction.)	MAWP is minimum of Body Rating or Seal Rating (See Model Selection Guide for Seal MAWP) <table> <tr> <td>Body</td> <td>MAWP</td> </tr> <tr> <td>STR93D</td> <td>750 psig (52 bar)</td> </tr> <tr> <td>STR94G</td> <td>500 psig (35 bar)</td> </tr> </table>								Body	MAWP	STR93D	750 psig (52 bar)	STR94G	500 psig (35 bar)
Body	MAWP													
STR93D	750 psig (52 bar)													
STR94G	500 psig (35 bar)													

<sup>1</sup> For CTFE fill fluid, the rating is -15 to 110°C (5 to 230°F)

<sup>2</sup> Short term equals 2 hours at 70°C (158°F)

<sup>3</sup> MAWP applies for temperature range -40 to 125°C. However, Static Pressure Limit is de-rated to 3,000 psi from -26°C to -40°C. Use of graphite o-rings de-rates transmitter to 3,625 psi. Use of adaptor with graphite o-rings de-rates transmitter to 3,000 psi.

<sup>4</sup> Consult factory for MAWP of ST 3000 transmitters with CSA approval.

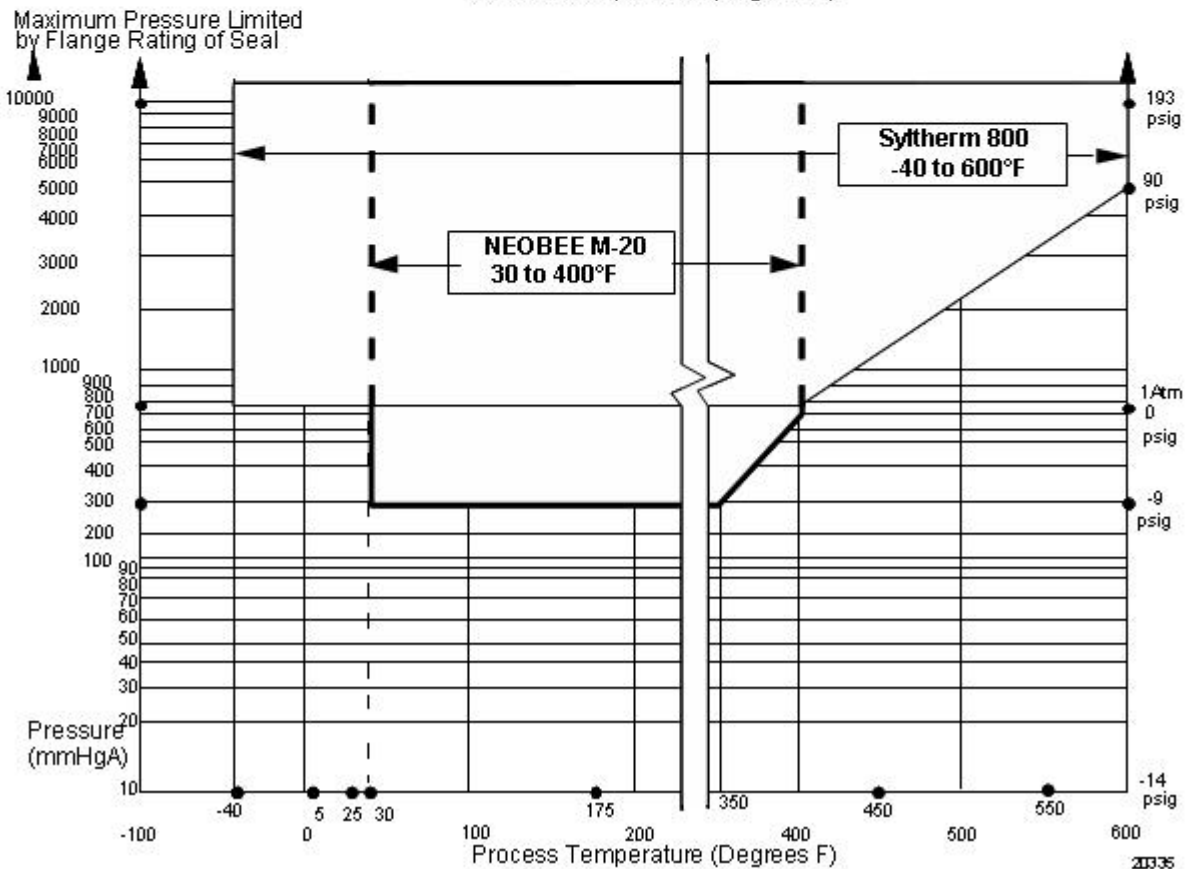
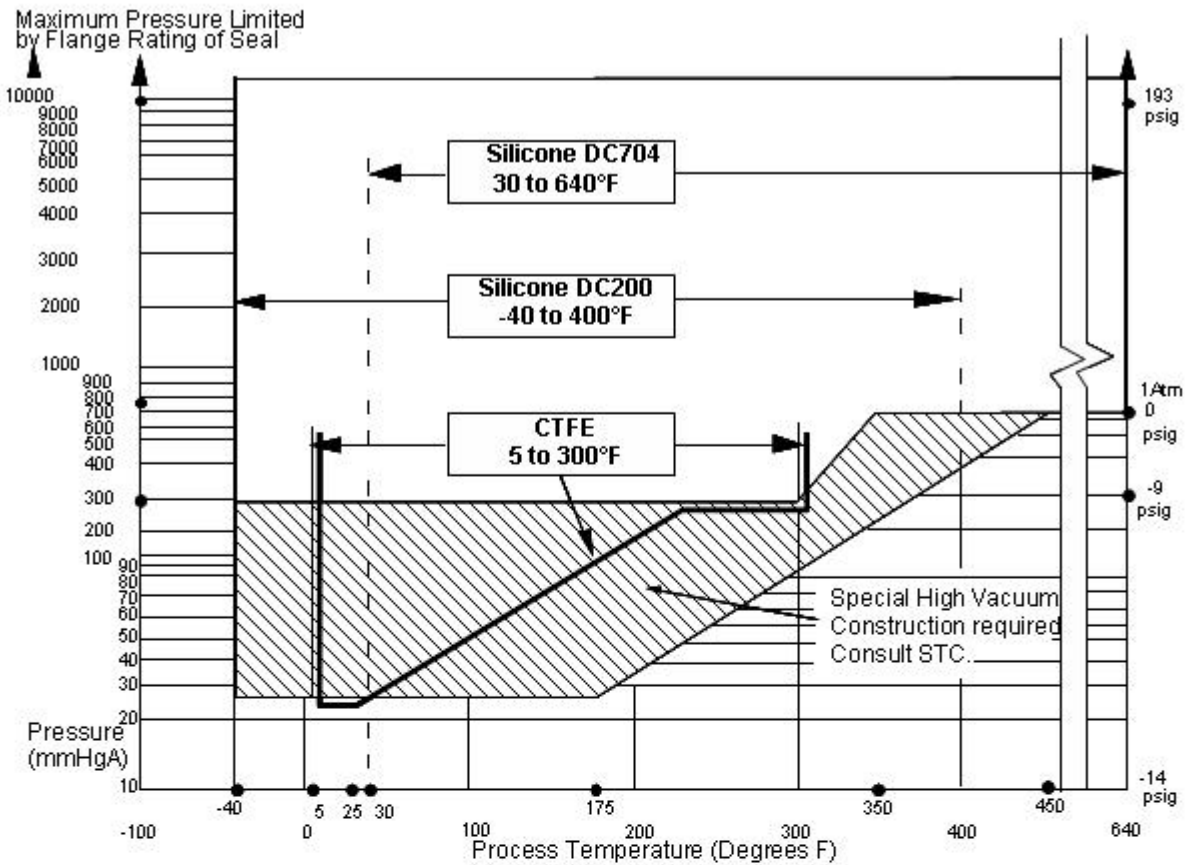


Figure 13—ST 3000 Remote Seals operable limits for pressure versus temperature

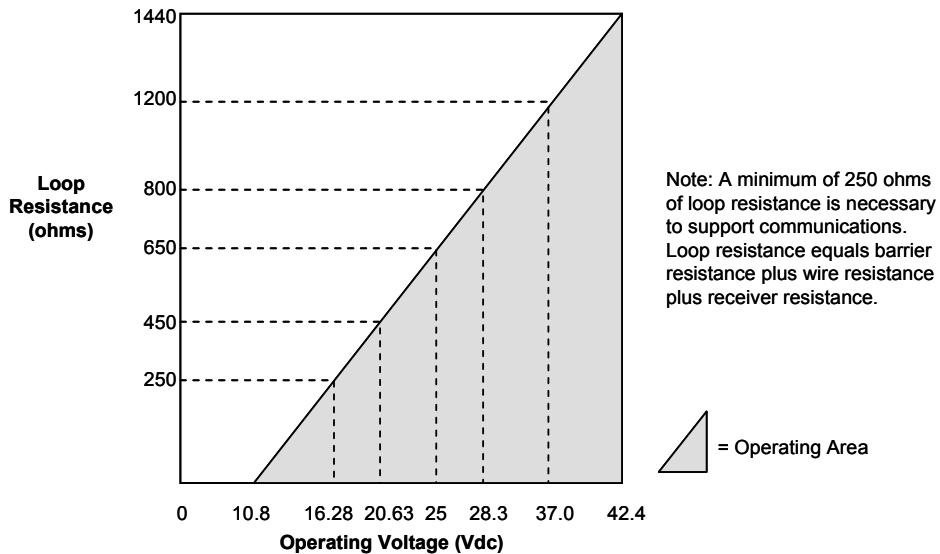


Figure 14—Supply voltage and loop resistance chart

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

Parameter	Description	
<b>Upper Range Limit</b>	psi bar	100 7
<b>Minimum Span</b>	psi bar	0.9 0.063
<b>Turndown Ratio</b>	110 to 1	
<b>Zero Elevation and Suppression</b>	No limit except minimum span within ±100% URL.	
<b>Accuracy</b> (Reference – Includes combined effects of linearity, hysteresis, and repeatability) <ul style="list-style-type: none"> <li>Accuracy includes residual error after averaging successive readings.</li> <li>For FOUNDATION™ Fieldbus use Digital Mode specifications.</li> <li>For HART® use Analog Mode specifications.</li> </ul>	<b>In Analog Mode:</b> ±0.20% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (50 inH <sub>2</sub> O), accuracy equals: $\pm \left[ 0.10 + 0.10 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \right] \text{ or } \pm \left[ 0.10 + 0.10 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right) \right] \text{ in \% of span}$ <b>In Digital Mode:</b> ±0.175% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (50 inH <sub>2</sub> O), accuracy equals: $\pm \left[ 0.075 + 0.10 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \right] \text{ or } \pm \left[ 0.075 + 0.10 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right) \right] \text{ in \% of span}$	
<b>Combined Zero and Span Temperature Effect per 28°C (50°F)**</b>	<b>In Analog Mode:</b> ±1.5% of span. For URV below reference point (200 inH <sub>2</sub> O), effect equals: $\pm \left[ 0.30 + 1.2 \left( \frac{200 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \right] \text{ or } \pm \left[ 0.30 + 1.2 \left( \frac{500 \text{ mbar}}{\text{span mbar}} \right) \right] \text{ in \% of span}$ <b>In Digital Mode:</b> ±1.475% of span. For URV below reference point (200 inH <sub>2</sub> O), effect equals: $\pm \left[ 0.275 + 1.2 \left( \frac{200 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \right] \text{ or } \pm \left[ 0.275 + 1.2 \left( \frac{500 \text{ mbar}}{\text{span mbar}} \right) \right] \text{ in \% of span}$	

\* 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
<b>Upper Range Limit</b>	<b>psi</b> 500 <b>bar</b> 35
<b>Minimum Span</b>	<b>psi</b> 20 <b>bar</b> 1.4
<b>Turndown Ratio</b>	100 to 1
<b>Zero Elevation and Suppression</b>	No limit except minimum span from absolute 0 (zero) to +100% URL.
<b>Accuracy</b> (Reference – Includes combined effects of linearity, hysteresis, and repeatability) <ul style="list-style-type: none"> <li>• Accuracy includes residual error after averaging successive readings.</li> <li>• For FOUNDATION™ Fieldbus use Digital Mode specifications.</li> <li>• For HART® use Analog Mode specifications.</li> </ul>	<p><b>In Analog Mode:</b> ±0.10% of calibrated span or upper range value (URV), whichever is greater, terminal based.</p> <p><b>In Digital Mode:</b> ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based.</p>

\* 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.

<b>Transmitter Minimum Span and Maximum Capillary Length</b>
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**Minimum recommended span for STR93D DP Transmitter with two Remote Seals**

Diaphragm Size	Capillary							Capillary Length maximum
	5'	10'	15'	20'	25'	30'	35'	
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 Size	Direct Mount	Capillary						Capillary Length maximum
		5'	10'	15'	20'	30'	35'	
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.



## Certifications

	Type of Protection	Comm. Option	Field Parameters	Temperature Codes
<b>FM Approvals<sup>SM</sup></b>	<b>Explosionproof:</b> Class I, Division 1, Groups A, B, C, D locations  <b>Dust Ignition Proof:</b> Class II, III, Division 1, Groups E, F, G locations, Enclosure Type 4X	All	All	T5 Ta = 93°C
	<b>Intrinsically Safe:</b>  Class I, II, III, Division 1, Groups A, B, C, D, E, F, G locations, Enclosure Type 4X	4-20 mA / DE	Vmax = 42.4V Imax = 225mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = 93°C
		4-20 mA / HART®	Vmax = 30V Imax = 225mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = 93°C
	<b>Intrinsically Safe:</b>  Class I, II, III, Division 1, Groups A, B, C, D, E, F, G locations;  Class 1, Zone 0, AEx ia Group IIC, Enclosure Type 4X / IP 66/67	Fieldbus – Entity (Not FISCO)	Vmax = 32V Imax = 120mA Ci = 4.2nF Li = 0 Pi = 0.84W	T4 Ta = 40°C T3 Ta = 93°C
		Fieldbus – Entity (Not FISCO)	Vmax = 24V Imax = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T4 Ta = 40°C T3 Ta = 93°C
		FISCO	Vmax = 17.5V Imax = 380mA Ci = 4.2nF Li = 0 Pi = 5.32W	T4 Ta = 40°C T3 Ta = 93°C
	<b>Nonincendive:</b>  Class I, Division 2, Groups A, B, C, D locations, Enclosure Type 4X	4-20 mA / DE	Vmax = 42.4V Imax = 225mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = 93°C
		4-20 mA / HART	Vmax = 30V Imax = 225mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = 93°C
	<b>Nonincendive:</b>  Class I, Division 2, Groups A, B, C, D;  Suitable for: Class II, Division 2, Groups F&G; Class III, Division 2; Class I, Zone 2, Group IIC, Enclosure Type 4X / IP 66/67	Fieldbus – Entity (Not FNICO)	Vmax = 32V Imax = 120mA Ci = 4.2nF Li = 0 Pi = 0.84W	T4 Ta = 40°C T3 Ta = 93°C
		Fieldbus – Entity (Not FNICO)	Vmax = 24V Imax = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T4 Ta = 40°C T3 Ta = 93°C
		FNICO	Vmax = 32V Ci = 4.2nF Li = 0	T4 Ta = 40°C T3 Ta = 93°C

\* Li = 0 except Li = 150µH when Option ME, Analog Meter, is selected.

FM Approvals<sup>SM</sup> is a service mark of FM Global

	Type of Protection	Comm. Option	Field Parameters	Temp. Codes	
<b>Canadian Standards Association (CSA)</b>	<b>Explosion Proof:</b> Class I, Division 1, Groups B, C, D locations <b>Dust Ignition Proof:</b> Class II, III, Division 1, Groups E, F, G locations, Enclosure Type 4X	All	All	T4 Ta = 93°C	
	<b>Intrinsically Safe:</b>  Class I, II, III, Division 1, Groups A, B, C, D, E, F, G locations, Enclosure Type 4X	4-20 mA / DE	Vmax = 42V Imax = 225mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = 93°C	
		4-20 mA / HART®	Vmax = 42V Imax = 225mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = 93°C	
		Fieldbus – Entity (Not FISCO)	Vmax = 24V Imax = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T4 Ta = 40°C T3 Ta = 93°C	
	<b>Nonincendive:</b>  Class I, Division 2, Groups A, B, C, D locations, Enclosure Type 4X	4-20 mA / DE	Vmax = 42.4V Imax = 225mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = 93°C	
		4-20 mA / HART®	Vmax = 30V Imax = 225mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = 93°C	
		Fieldbus – Entity (Not FNICO)	Vmax = 24V Imax = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T4 Ta = 40°C T3 Ta = 93°C	
	<b>Canadian Registration Number (CRN):</b>	All ST 3000 models except STG19L, STG99L, STG170 and STG180 have been registered in all provinces and territories in Canada and are marked CRN: 0F8914.5C.			

	Type of Protection	Comm. Option	Field Parameters	Temp. Codes
<b>IECEX International Electrotechnical Commission (LCIE)</b>	<b>Flameproof, Zone 1:</b> Ex d IIC, Enclosure IP 66/67	All	All	T5 Ta = -50 to 93°C T6 Ta = -50 to 78°C
	<b>Intrinsically Safe, Zone 0/1:</b> Ex ia IIC, Enclosure IP 66/67	4-20 mA / DE	Ui = 30V li = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 85°C T6 Ta = -50 to 70°C
		4-20 mA / HART	Ui = 30V li = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 63°C T6 Ta = -50 to 48°C
		Fieldbus (Not FISCO)	Ui = 24V li = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T3 Ta = -50 to 93°C T4 Ta = -50 to 40°C

\* Li = 0 except Li = 150µH when Option ME, Analog Meter, is selected.

	Type of Protection	Comm. Option	Field Parameters	Temp. Codes
<b>SAEx (South Africa)</b>	<b>Flameproof, Zone 1:</b> Ex d IIC, Enclosure IP 66/67	All	All	T5 Ta = -50 to 93°C T6 Ta = -50 to 78°C
	<b>Intrinsically Safe, Zone 0/1:</b> Ex ia IIC, Enclosure IP 66/67	4-20 mA / DE	Ui = 30V li = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 85°C T6 Ta = -50 to 70°C
		4-20 mA / HART	Ui = 30V li = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 63°C T6 Ta = -50 to 48°C
		Fieldbus (Not FISCO)	Ui = 24V li = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T3 Ta = -50 to 93°C T4 Ta = -50 to 40°C
	<b>Multiple Marking:</b> <b>Flameproof, Zone 1:</b> Ex d IIC, Enclosure IP 66/67  <b>Intrinsically Safe, Zone 0/1:</b> Ex ia IIC, Enclosure IP 66/67  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, subsequently the equipment shall not be reinstalled using any of the other certification types.	4-20 mA / DE	Ui = 30V li = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 85°C T6 Ta = -50 to 70°C
		4-20 mA / HART	Ui = 30V li = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 63°C T6 Ta = -50 to 48°C
		Fieldbus (Not FISCO)	Ui = 24V li = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T3 Ta = -50 to 93°C T4 Ta = -50 to 40°C

\* Li = 0 except Li = 150µH when Option ME, Analog Meter, is selected.

	Type of Protection	Comm. Option	Field Parameters	Temp. Codes
ATEX (LCIE)	<b>Flameproof, Zone 0:</b> ⊕ II 1 D, Ex tD Enclosure IP 66/67	All	All	A20 IP6X T95°C Ta = 93°C or T80°C Ta = 78°C
	<b>Flameproof, Zone 1:</b> ⊕ II 2 GD, Ex d IIC, Ex tD Enclosure IP 66/67	All	All	T5 Ta = -50 to +93°C T6 Ta = -50 to +78°C, A21 IP6X T95°C Ta = 93°C or T80°C Ta = 78°C
	<b>Intrinsically Safe, Zone 0/1:</b> ⊕ II 1 G, Ex ia IIC, Enclosure IP 66/67	4-20 mA / DE	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 85°C T6 Ta = -50 to 70°C
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 63°C T6 Ta = -50 to 48°C
		Fieldbus (Not FISCO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T3 Ta = -50 to 93°C T4 Ta = -50 to 40°C
	<b>Non-Sparking, Zone 2:</b> ⊕ II 3 G, Ex nA IIC (Honeywell), Enclosure IP 66/67	4-20 mA / DE	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 85°C T6 Ta = -50 to 70°C
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 63°C T6 Ta = -50 to 48°C
		Fieldbus (Not FNICO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T3 Ta = -50 to 93°C T4 Ta = -50 to 40°C
	<b>Multiple Marking:</b> <b>Flameproof, Zone 1:</b> ⊕ II 2 G, Ex d IIC <b>Intrinsically Safe, Zone 0/1:</b> ⊕ II 1 G, Ex ia IIC <b>Non-Sparking, Zone 2:</b> ⊕ II 3 G, Ex nA IIC  <b>NOTE:</b> 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, subsequently the equipment shall not be reinstalled using any of the other certification types.	4-20 mA / DE	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 85°C T6 Ta = -50 to 70°C
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 63°C T6 Ta = -50 to 48°C
		Fieldbus (Not FISCO/FNICO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T3 Ta = -50 to 93°C T4 Ta = -50 to 40°C

\* Li = 0 except Li = 150µH when Option ME, Analog Meter, is selected.

	Type of Protection	Comm. Option	Field Parameters	Temp. Codes
<b>INMETRO (CERTUSP) Brazil</b>	<b>Flameproof, Zone 1:</b> BR-Ex d IIC Enclosure IP 66/67	All	All	T5 Ta = -50 to 93°C T6 Ta = -50 to 78°C
	<b>Intrinsically Safe, Zone 0/1:</b> BR-Ex ia IIC Enclosure IP 66/67	4-20 mA / DE	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 85°C T6 Ta = -50 to 70°C
		4-20 mA / HART®	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi = 1.2W	T4 Ta = -50 to 93°C T5 Ta = -50 to 63°C T6 Ta = -50 to 48°C
		Fieldbus (Not FISCO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi = 1.2W	T3 Ta = -50 to 93°C T4 Ta = -50 to 40°C

\* Li = 0 except Li = 150µH when Option ME, Analog Meter, is selected.

<b>ST 3000 Pressure Transmitter Marine Certificate (MT Option)</b>	This certificate defines the certifications covered for the ST 3000 Pressure Transmitter family of products, including the SMV 3000 Smart Multivariable Transmitter. It represents the compilation of the five certificates Honeywell currently has covering the certification of these products into marine applications.  For ST 3000 Smart Pressure Transmitter and SMV 3000 Smart Multivariable Transmitter
	<b>American Bureau of Shipping (ABS)</b> - 2009 Steel Vessel Rules 1-1-4/3.7, 4-6-2/5.15, 4-8-3/13 & 13.5, 4-8-4/27.5.1, 4-9-7/13. Certificate number: 04-HS417416-PDA
	<b>Bureau Veritas (BV)</b> - Product Code: 389:1H. Certificate number: 12660/B0 BV
	<b>Det Norske Veritas (DNV)</b> - Location Classes: Temperature D, Humidity B, Vibration A, EMC B, Enclosure C. For salt spray exposure; enclosure of 316 SST or 2-part epoxy protection with 316 SST bolts to be applied. Certificate number: A-11476
	<b>Korean Register of Shipping (KR)</b> - Certificate number: LOX17743-AE001
	<b>Lloyd's Register (LR)</b> - Certificate number: 02/60001(E1) & (E2)

<p><b>European Pressure Equipment Directive (PED) (97/23/EC)</b></p>	<p>The ST 3000 Smart Pressure Transmitters are in conformity with the essential requirements of the Pressure Equipment Directive.</p> <p>Honeywell ST 3000 Smart Pressure Transmitters are designed and manufactured in accordance with the applicable portions of Annex I, Essential Safety Requirements, and sound engineering practices. These transmitters have no pressurized internal volume, or have a pressurized internal volume rated less than 200 bar (2,900 psig), and/or have a maximum volume of less than 0.1 liter (Article 3, 1.1.(a) first indent, Group 1 fluids). Therefore, these transmitters are not subject to the essential requirements of the directive 97/23/EC (PED, Annex I) and shall not have the CE mark applied.</p> <p>For transmitters rated &gt; 200 bar (2,900 psig) &lt; 1,000 bar (14,500 psig) Honeywell maintains a technical file in accordance with Annex III, Module A, (internal production control) when the CE mark is required. Transmitter Attachments: Diaphragm Seals, Process Flanges and Manifolds comply with Sound Engineering Practice.</p> <p><b>NOTE:</b> 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.</p> <p>A formal statement from TÜV Industry Service Group of TÜV America, Inc., a division of TÜV Süddeutschland, a Notified Body regarding the Pressure Equipment Directive, can be found at <a href="http://www.honeywell.com">www.honeywell.com</a>. A hard copy may be obtained by contacting a Honeywell representative.</p>
<p><b>CE Mark</b></p>	<p><b><i>Electro Magnetic Compatibility (EMC) (2004/108/EC)</i></b> All Models: EN 50081-1: 1992; EN 50082-2:1995; EN 61326-1:1997 + A1, A2, and A3 – Industrial Locations</p>
<p><b>Dual Seal Certification</b></p>	<p>Dual Seal Certification based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.01 requirements without the use of additional seal protection elements.</p>
<p><b>Recommended Frequency of Calibration</b></p>	<p>Honeywell recommends verifying the calibration of these devices once every four years.</p>
<p><b>Approved Manufacturing Locations</b></p>	<p>Honeywell Process Solutions - York, PA USA Honeywell (Tianjin) Limited – Tianjin, P.R. China Honeywell Automation India Ltd – Pune 411013 India</p>

Foundation™ Fieldbus is a trademark of the Fieldbus Foundation.

HART® is a registered trademark of HART Communications Foundation.

Hastelloy® C-276 is a registered trademark of Haynes International.

Monel® 400 is a registered trademark of Special Metals Corporation.

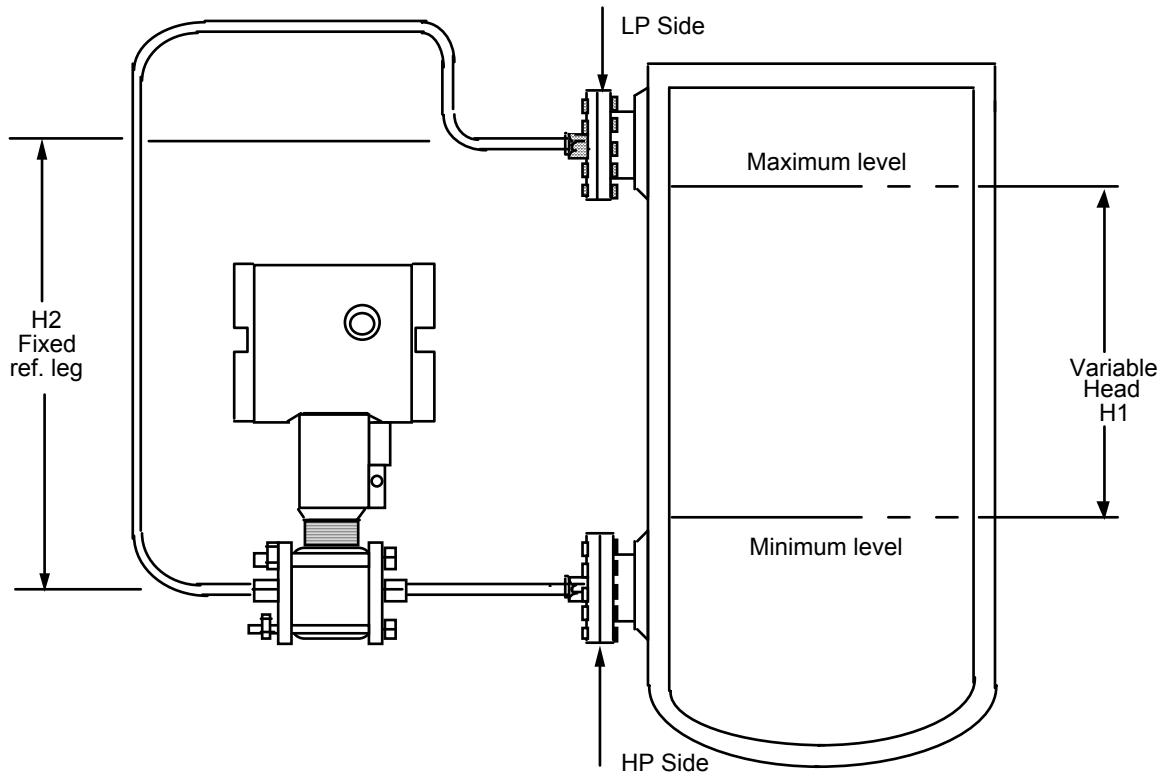
ST 3000® and Experion® are registered trademarks of Honeywell International Inc.

Viton® is a registered trademark of DuPont

Teflon® is a registered trademark of DuPont.

DC® 200 is a registered trademark of Dow Corning.

FM Approvals<sup>SM</sup> is a service mark of FM Global

**Mounting**

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

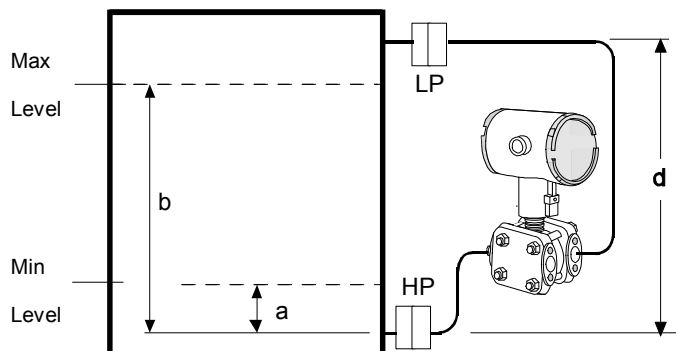
a = distance between bottom tap and minimum level

b = distance between bottom tap and maximum level

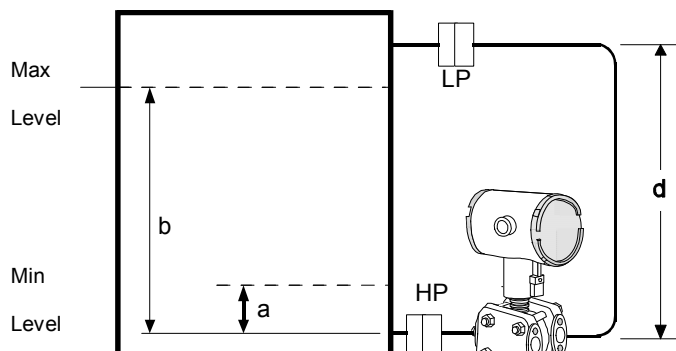
d = distance between taps

SG<sub>f</sub> = Specific Gravity of capillary fill fluid (See Page 9 for values.)

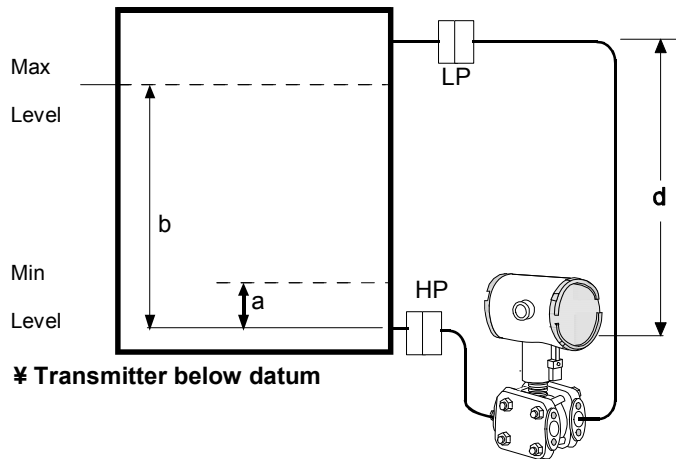
SG<sub>p</sub> = Specific Gravity of process fluid



≠ Transmitter above datum



≠ Transmitter at datum



≠ Transmitter below datum

Figure 17—Closed tank liquid level measurement distance 24253

**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

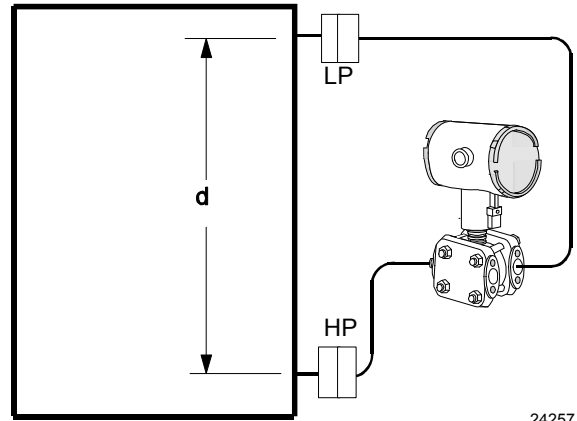
*Where:*

$d$  = distance between the taps

$SG_{\max}$  = maximum Specific Gravity

$SG_{\min}$  = minimum Specific Gravity

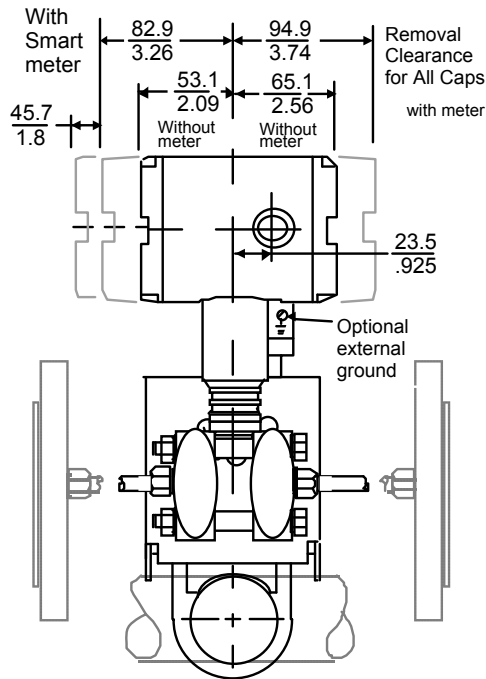
$SG_f$  = Specific Gravity of capillary fill fluid (See Page 9 for values.)



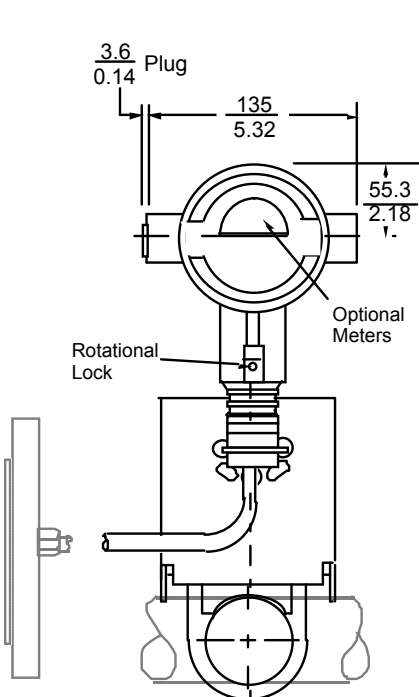
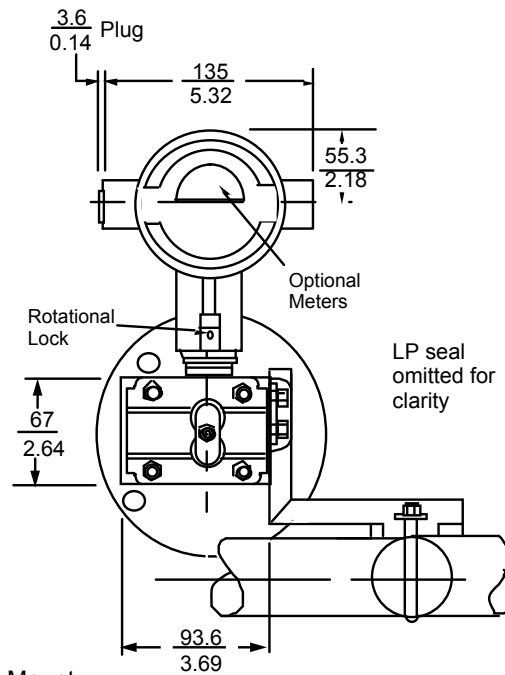
**Figure 18**—Density, direct acting transmitter configuration

**Reference Dimensions**

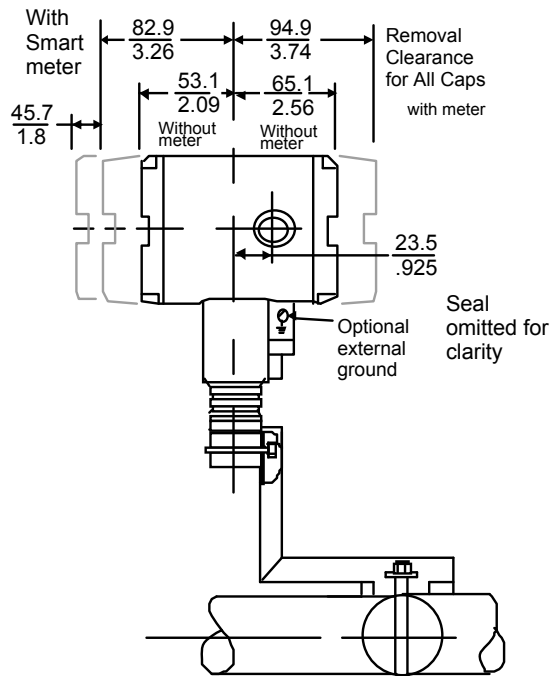
millimeters  
inches



STR93D DP/I Remote Seal with Horizontal Pipe Mount



STR94G LGP/I Remote Seal with Horizontal Pipe Mount



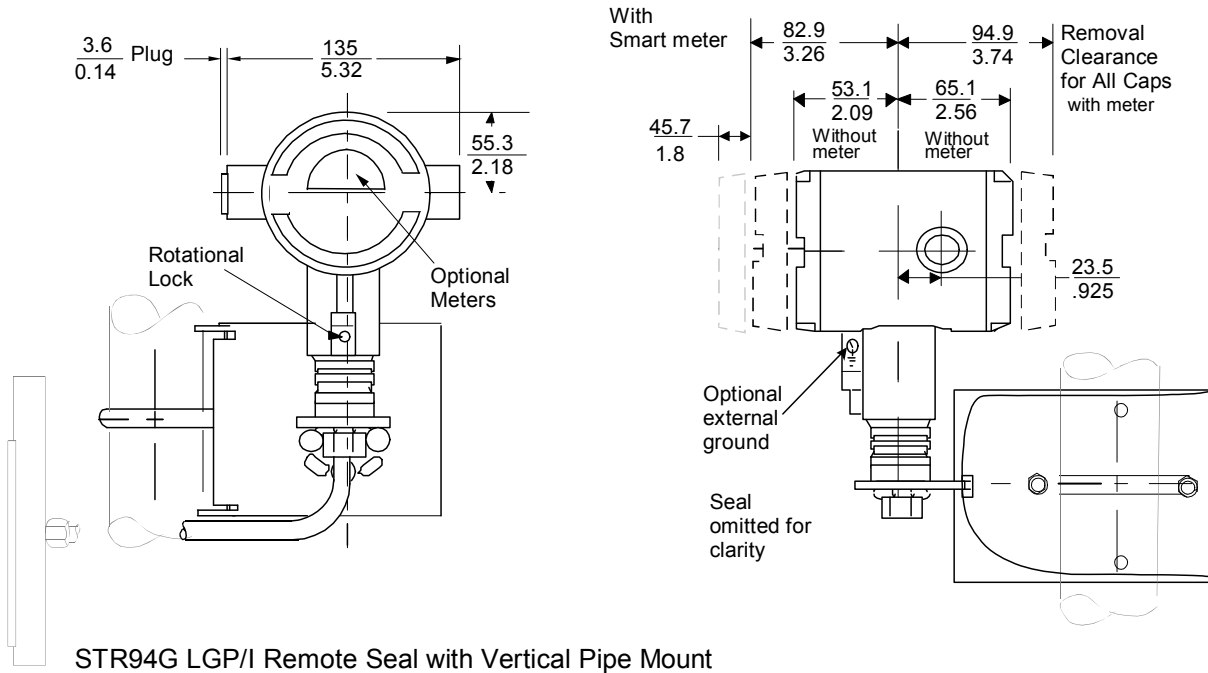
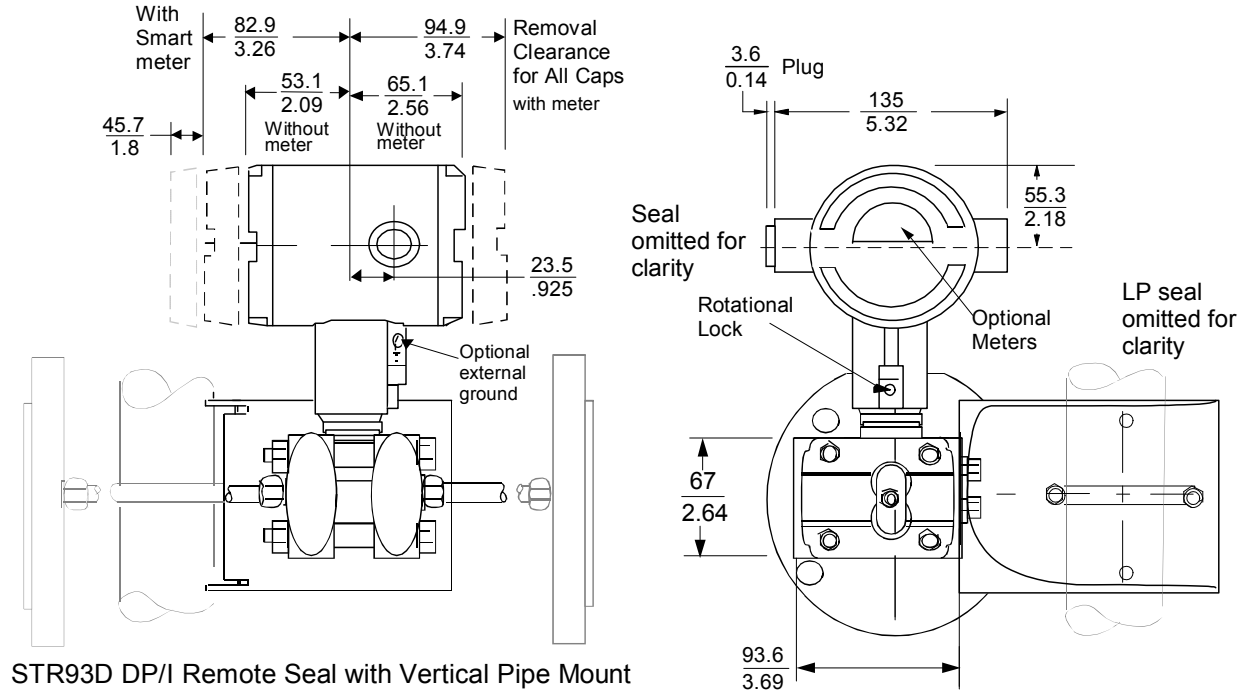
**Figure 19**—Approximate horizontal mounting dimensions for Remote Seal Transmitter

24272

Dimensions are for reference only and may be subject to change. For specific information contact Honeywell customer service per the contact information located with in this document.

**Reference Dimensions**

millimeters  
inches



24273

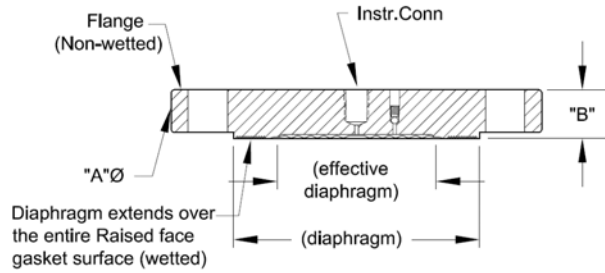
**Figure 20**—Approximate vertical mounting dimensions for Remote Seal Transmitter

Dimensions are for reference only and may be subject to change. For specific information contact Honeywell customer service per the contact information located with in this document.

## Dimensions and Drawings

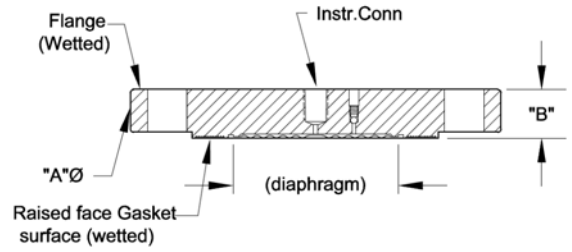
### Flush Flanged Seal

Type	ANSI/DIN Rating	Flange Material	Wetted Materials		Construction See figure	↔	↕	
			Diaphragm	Body		A	B	
Flush Flanged Seal	3" Class 150#	CS	SS	SS	D	7.5	1.37	
			Hastelloy C	SS	C			
			Hastelloy C	Hastelloy C	D			
			Monel	Monel	D			
				Tantalum	SS	C		
	3" Class 150#	SS		SS	N/A	B	7.50	0.94
				Hastelloy C	SS	A		
				Hastelloy C	Hastelloy C	D		
				Monel	Monel	D		
				Tantalum	SS	C		1.37
	3" Class 300#	CS		SS	SS	D	8.25	1.56
				Hastelloy C	SS	C		
Hastelloy C				Hastelloy C	D			
Monel				Monel	D			
			Tantalum	SS	C			
3" Class 300#	SS		SS	N/A	B	8.25	1.12	
			Hastelloy C	SS	A			
			Hastelloy C	Hastelloy C	D			
			Monel	Monel	D			
			Tantalum	SS	C		1.56	
3" Class 600#	CS		SS	SS	D	8.25	1.75	
			Hastelloy C	SS	C			
			Hastelloy C	Hastelloy C	D			
			Monel	Monel	D			
			Tantalum	SS	C			
3" Class 600#	SS		SS	N/A	B	8.25	1.5	
			Hastelloy C	SS	A			
			Hastelloy C	Hastelloy C	D			
			Monel	Monel	D			
			Tantalum	SS	C		1.75	
DN80-PN40	CS		SS	SS	D	7.87	1.32	
			Hastelloy C	SS	C			
			Hastelloy C	Hastelloy C	D			
			Monel	Monel	D			
			Tantalum	SS	C			
DN80-PN40	SS		SS	N/A	B	7.87	0.94	
			Hastelloy C	SS	A			
			Hastelloy C	Hastelloy C	D			
			Monel	Monel	D			
			Tantalum	SS	C		1.32	



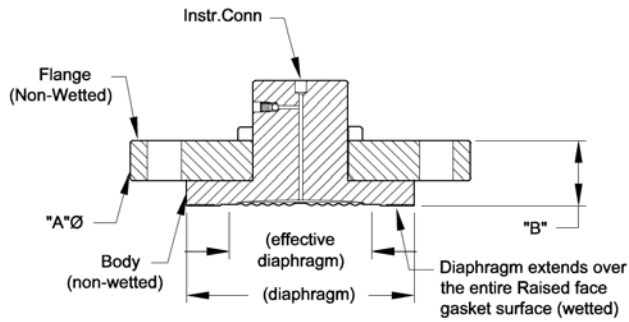
**Configuration "HS"**

**Figure "A"**



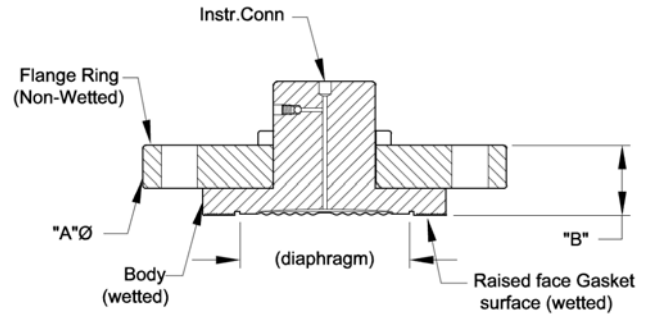
**Configuration "HT"**

**Figure "B"**



**Configuration "IS"**

**Figure "C"**



**Configuration "IT"**

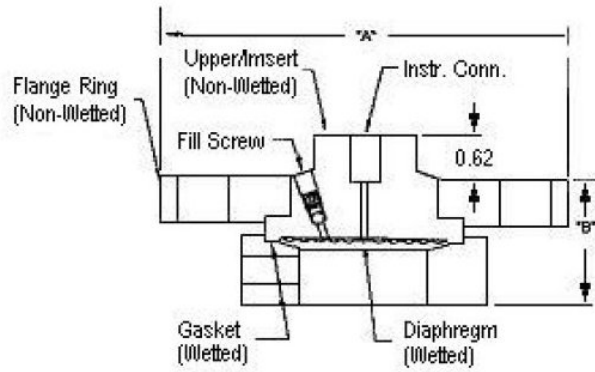
**Figure "D"**

## Dimensions and Drawings

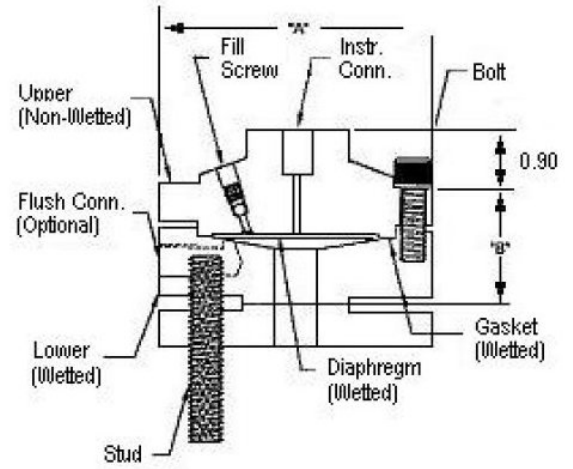
### Flush Flanged Seal with Lower

Type	ANSI/DIN Rating	Size	Dimension	2.4" Diaph. Dia. (in.)	2.9" Diaph. Dia. (in.)	4.1" Diaph. Dia. (in.)
Flush Flanged Seal with Lower	Class 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"	B0	4.25	4.00	5.25
			B1	1.12	1.72	1.84
			B2	1.62	1.72	1.84
		1-1/2"	B0	5.00	5.00	5.25
			B1	2.50	2.50	1.78
			B2	3.00	3.00	2.12
			B2	3.50	3.40	2.12
		2"	A	6.00	6.00	6.00
			B0	2.50	2.50	2.12
			B1	3.00	3.00	2.12
			B2	3.50	3.40	2.12
	3"	A	7.50	7.50	7.50	
		B0	2.58	2.88	2.80	
		B1	2.88	2.88	3.00	
		B2	3.50	3.40	3.40	
	Class 300#	1"	A	4.88	4.00	5.25
			B0	2.50	1.72	1.88
			B1	3.00	1.72	2.12
			B2	3.50	2.22	2.12
		1-1/2"	A	6.12	6.12	5.25
B0			2.50	2.50	2.12	
B1			3.00	3.00	2.12	
B2			3.50	3.40	2.12	
2"		A	6.50	6.50	6.50	
		B0	2.50	2.50	2.70	
		B1	3.00	3.00	3.00	
		B2	3.50	3.40	3.50	
3"	A	8.25	8.25	8.25		
	B0	3.48	3.48	3.20		
	B1	3.48	3.48	3.60		
	B2	4.10	4.00	4.00		
Class 600#	1"	A	4.88	4.50	5.25	
		B0	2.50	2.15	2.26	
		B1	3.00	2.15	2.26	
		B2	3.50	2.40	2.50	
	1-1/2"	A	6.12	6.12	5.25	
		B0	2.50	1.53	2.50	
		B1	3.00	2.09	3.00	
		B2	3.50	2.49	3.50	
	2"	A	6.50	6.50	6.50	
		B0	3.10	3.10	3.30	
		B1	3.60	3.60	3.60	
		B2	4.10	4.00	4.10	
	3"	A	8.25	8.25	8.25	
		B0	3.48	3.48	3.20	
		B1	3.48	3.48	3.60	
		B2	4.10	4.00	4.00	

- B0 Without Flush  
 B1 B Dimension with 1/4 NPT Flushing Connection  
 B2 B dimension with 1/2 NPT Flushing Connection



**Flush Flanged Seal with Lower**



**Flush Flanged Seal with Lower**

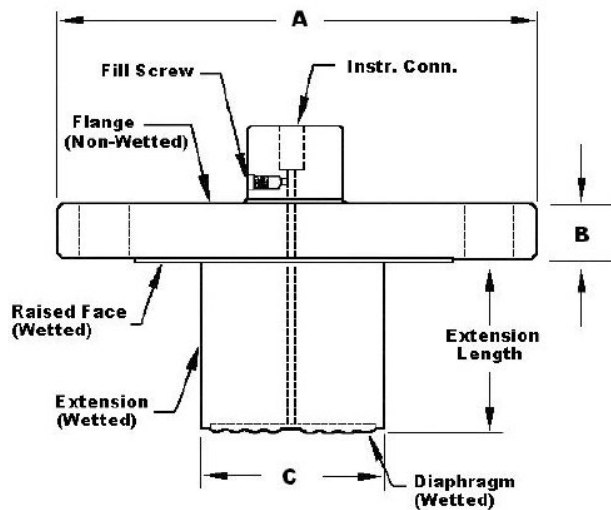
Note: 0.90 dimension is 0.70 for 4.1" Dia. Diaphragm

**Dimensions and Drawings**

**Flanged Seal with Extended Diaphragm**

Type	ANSI/DIN Rating	Dimension	2.8" Diaphragm Dia. (in.)	3.5" Diaphragm Dia. (in.)
Flanged Seal with Extended Diaphragm	3" Class 150#	A	7.50	-
		B	0.94	-
		C	2.80	-
	3" Class 300#	A	8.25	-
		B	1.12	-
		C	2.80	-
	DIN DN80-PN40	A	7.87	-
		B	0.94	-
		C	2.80	-
	4" Class 150#	A	-	9.00
		B	-	0.94
		C	-	3.70
4" Class 300#	A	-	10.00	
	B	-	1.25	
	C	-	3.70	
DIN DN80-PN40	A	-	9.25	
	B	-	0.94	
	C	-	3.70	

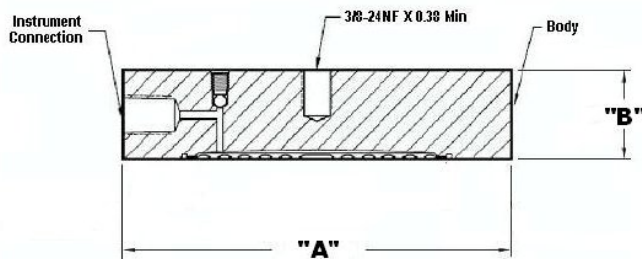
Designed to meet with schedule 40 pipe



**Flange Extended Seal**

**Pancake Seal**

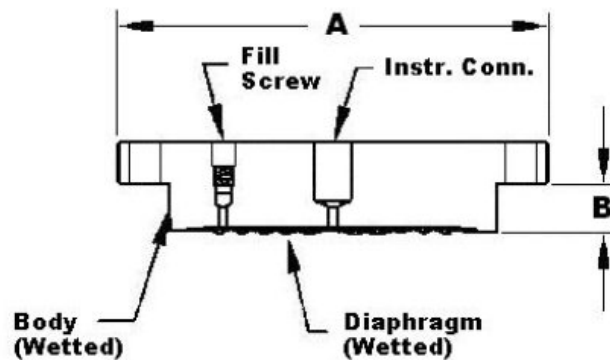
Type	ANSI/DIN	Dimension	3.5" Diaph. (in.)
Pancake Seal	Class 150#, 300#, 600# DN80-PN40	A	5.00
		B	1.08



**Pancake Flange Seal**

**Chemical Tee "Taylor Wedge" Seal**

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

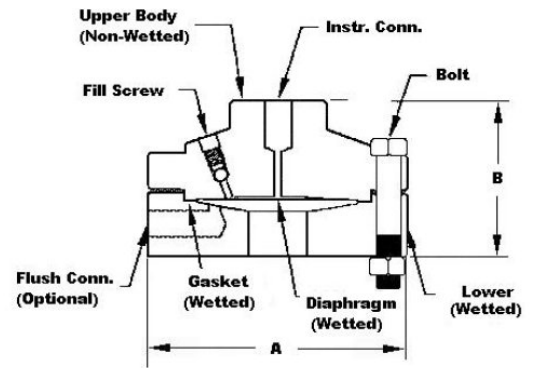


**Chemical Tee "Taylor Wedge" Seal**

**Seal with Threaded Process Connection**

Type	Size	Dimension	2.4" Diaphragm Dia. (in.)	2.9" Diaphragm Dia. (in.)	4.1" Diaphragm Dia. (in.)
Threaded Process Conn. Seal	1/4" or 1/2"	A	3.50	4.00	5.25
		B0	1.88	1.88	1.79
		B1	1.88	1.88	1.79
	3/4" or 1"	A	3.50	4.00	5.25
		B0	1.88	1.88	1.79
		B1	1.88	1.88	1.79
		B2	8.25	2.18	2.14

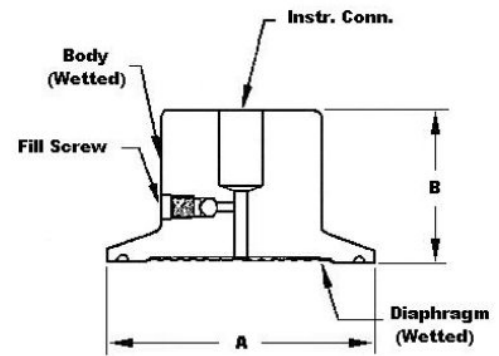
B0 Without Flush  
 B1 B Dimension with 1/4 NPT Flushing Connection  
 B2 B dimension with 1/2 NPT Flushing Connection



**Threaded Process Connection Seal**

**Sanitary Seal**

Type	Size	Dimension	1.9" Diaphragm Dia. (in.)	2.4" Diaphragm Dia. (in.)	2.9" Diaphragm Dia. (in.)	4.1" Diaphragm 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	

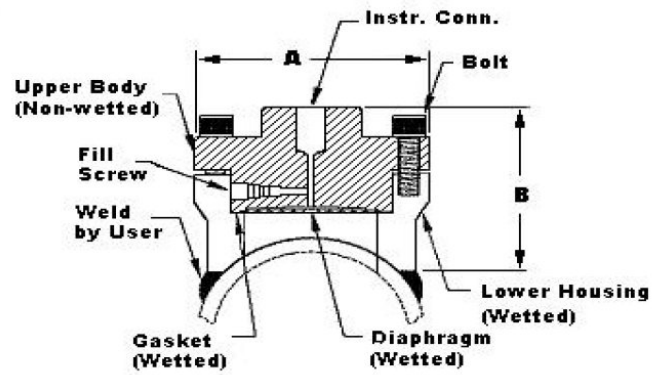


**Sanitary Seal**

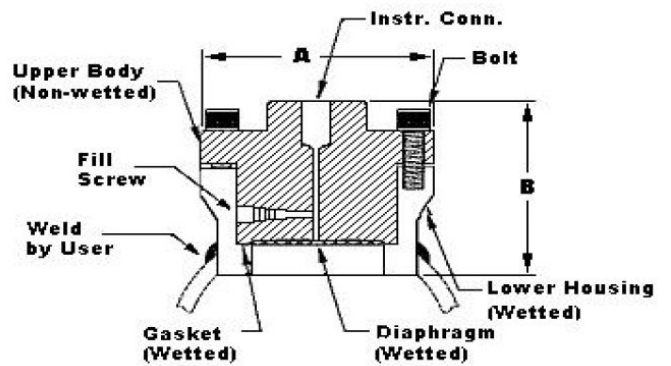
**Saddle Seal**

Type	Size	Dimension	2.4" Diaph. (in.)
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



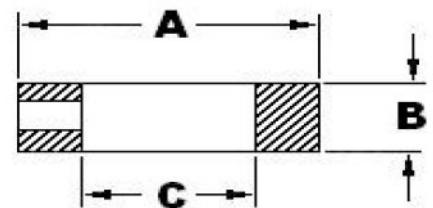
**3" Saddle Seal**



**4" Saddle Seal**

**Calibration Rings**

Type	Size	Rating	Dimension	1/4 NPT	1/2 NPT
Calibration Ring	3"	150# / 800#	A	5.00	5.00
			B	1.00	1.50
			C	3.00	3.00



**Calibration Ring**

## Options

- **High Accuracy (Option HA)**  
Extends applicable S100 models to  $\pm 0.025\%$  analog reference accuracy.
- **Angle Mounting Bracket (Options MB, MX, SB, SX, FB)**  
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. An option also exists for Marine approved mounting brackets used with Marine certification options.
- **Indicating Meter (Options ME and SM)**  
Two integral meter options are available. An analog meter (option ME) is available with a dual 0 to 10 square root and 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 selected engineering units.
- **HART<sup>®</sup> Output Protocol (Options HC and H6)**  
Optional electronic modules for the ST 3000 provide HART<sup>®</sup> Protocol compatibility in either HART<sup>®</sup> 5.x or 6.x formats. Transmitters with a HART<sup>®</sup> Option are compatible with any HART<sup>®</sup> enabled system that provides 5.x or 6.x format support.
- **Foundation<sup>™</sup> Fieldbus Output (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.
- **SIL2/SIL3 Certification (Option SL)**  
This ST 3000 product is available for use with safety systems. With the SL option, we are fully certified to SIL 2 capability for single transmitters and SIL 3 capability for multiple transmitter use through TÜV Nord Sys Tec GmbH & Co. KG. We are in compliance with the following SIL standards:

  - IEC 61508-1: 1998
  - IEC 61508-2: 2000
  - IEC 61508-3: 1998
- **Lightning Protection (Option LP)**  
A terminal block is available with circuitry that protects the transmitter from transient surges induced by nearby lightning strikes.
- **NAMUR NE43 Compliance (Option NE)**  
This option provides software that meets the NAMUR NE43 requirements for failsafe software. Transmitter failure information is generated when the measuring information is no longer valid.  
  
Transmitter failure values are  $\leq 3.6$  mA and  $\geq 21.0$  mA.  
  
The normal ST 3000 ranges are  $\leq 3.8$  mA and  $\geq 20.8$  mA.
- **Write Protection (Options WP and WX)**  
Provides the capability to hardwire write-protect installed transmitter configurations.
- **Stainless Steel 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. 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 (Options TC and FC)**  
With Option TC, the factory can configure the analog, DE or HART<sup>®</sup> transmitter's 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.  
  
With Option FC, the Device ID, Transmitter Tag, Unit Level Node Address, Output Mode and Damping Time Constants can be 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.
- **Indicator Configuration (Option CI)**  
Provides custom configuration of Smart Meters.
- **Lifetime Warranty (Option WL)**  
Extends limited 1-year warranty policy to 15 years for ST 3000 S100 pressure transmitters. See Honeywell Terms and Conditions.

## Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

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Model Selection Guides are subject to change and are inserted into the specifications as guidance only. Prior to specifying or ordering a model check for the latest revision Model Selection Guides which are published at: <http://hpsweb.honeywell.com/Cultures/en-US/Products/Instrumentation/ProductModelSelectionGuides/default.htm>

**Model Selection Guide**



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**ST 3000 Smart Transmitter  
(DP & GP) Remote Seals  
Series 900**

**Model Selection Guide**

**Instructions**

- Select the desired Key Number. The arrow to the right marks the selection available.
- Make selections from each Table (I, II and IV), using the column below the proper arrow.
- Select as many Table III options as desired plus a communications option selection.
- A (\*) denotes unrestricted availability. A letter denotes restricted availability.
- Restrictions follow Table IV.



Key Number    I    II    III (Optional)    IV

\_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ + \_\_\_\_\_

**KEY NUMBER**

Description	Selection	Avail.
<b>0-25" to 0-2,700" H<sub>2</sub>O / 0-62.2 to 0-7,000 mbar</b> Body Rating*: 750 psi (51.7 bar) Compound Characterized	STR93D	↓
<b>0-5 to 0-500 psig / 0-0.35 to 0-35 bar</b> Body Rating*: 500 psi (35 bar)	STR94G	↓

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

Important Note: Base STR models no longer include a default communications option. All units now require the selection of a communication option from Table III (AN, DE, HC, H6 or FF).

TABLE I - METER BODY

	Description	Selection		
Number of Seals	1 Remote Seal ( <i>High Side</i> )	1 __	•	•
	2 Remote Seals	2 __	•	
	1 Remote Seal ( <i>Low Side</i> )	3 __	•	
	Value Added Model ( <i>VAM unit</i> )	5 __	8	8
Fill Fluid ( <i>Meter Body</i> )	DC <sup>®</sup> 200 Silicone	_ 1 _	•	•
	CTFE	_ 2 _	q	q
Construction	<b>Non-Wetted Material</b>			
In-Line Gauge	316 SS	_ _ A		•
	316 SS for Close-Couple	_ _ D		y
Dual Head DP	316 SS Heads	_ _ A	•	
	316 SS Heads for Close-Couple connection	_ _ D	y	
	316 SS with all-welded meter body	_ _ C		7

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



In-Line Gauge



Dual Head DP



All Welded

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**TABLE II - SEALS**

Format for Seal Selection:					Availability		
Specify 12 characters					STR9xx		
<b>Note:</b> The first 3 characters are common to all seals. When selecting required seal, you must specify only the 9 selections within the required seal.							
					Selection	3D	4G
Secondary Fill	No Fill Fluid				0	3	3
	Silicone DC <sup>®</sup> 200				1	•	•
	CTFE				2	•	•
	Silicone DC <sup>®</sup> 704				3	•	•
	Neobee <sup>®</sup> M20 <sup>2</sup>				4	•	•
	Syltherm <sup>®</sup> 800 <sup>3</sup>				5	•	•
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	3	3
Flush Flanged Seal	Diaphragm Diameter	Flange Size	Flange Pressure Rating <sup>1</sup>		Selection		
	3.5"	3"	ANSI Class 150		_ _ AFA	•	•
		80mm	ANSI Class 300		_ _ AFC	•	•
			DIN DN80-PN40		_ _ AFM	•	•
	Wetted Material		Diaphragm	Upper Insert	Selection		
			316L SS	316L SS	_ _ AA	•	•
			Hastelloy <sup>®</sup> C-276	316L SS	_ _ AB	•	•
			Hastelloy <sup>®</sup> C-276	Hastelloy <sup>®</sup> C-276	_ _ AC	•	•
			Monel 400 <sup>®</sup>	Monel 400 <sup>®</sup>	_ _ AE	•	•
			Tantalum <sup>5</sup>	316L SS	_ _ AF	1	1
Flange Material		CS ( <i>Nickel Plated</i> )		_ _ _ 1	•	•	
		316L SS		_ _ _ 2	•	•	
Seal-Capillary Connection		Center Seal		_ _ _ 1	•	•	
		Side Seal		_ _ _ 2	9	9	
Calibration Rings		None		_ _ _ A	•	•	
		316L SS		_ _ _ B	5	5	
		Hastelloy <sup>®</sup> C-276		_ _ _ C	5	5	
		Monel 400 <sup>®</sup>		_ _ _ D	5	5	

Table II continued next page

<sup>1</sup> Standard facing 125-250 AARH RF (raised face) serrated surface finish.

<sup>2</sup> Limited vacuum availability.

<sup>3</sup> Minimum static pressure requirement. No vacuum allowed. See Specifications Figure 15.

<sup>5</sup> Tantalum Upper insert has Tantalum wetted parts and 316 SS or CS non-wetted parts

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

TABLE II - SEALS (continued)


		Description		Selection		Availability	
						3D	4G
 <p>Flush Flanged Seal</p>	Flushing Connections and Plugs <sup>4</sup> <i>Metal plug material will be the same as Lower material, if metal plug is chosen - (SS Plug for CS Lower and Tantalum Clad)</i>	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


		Diaphragm Diameter		Flange Size		Flange Pressure Rating <sup>1</sup>		Const. - See Spec. Figure 34-ST-03-57		Selection		Availability	
												3D	4G
 <p>Flush Flanged Seal with Lower</p>	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	•	•						
	2.9"	1/2"	ANSI 150	23	CAA	•	•						
		1"	ANSI 150	23	CCA	•	•						
			ANSI 300	23	CCC	•	•						
		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

<sup>1</sup> Standard facing 125-250 AARH RF (raised face) serrated surface finish.

<sup>4</sup> Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

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

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TABLE II - SEALS (continued)

					Availability		
					STR9xx	3D	4G
<p>Flush Flanged Seal with Lower (continued)</p>	Wetted Material	Diaphragm	Lower	Selection			
		316L SS	316L SS	----- BA -----	•	•	
		Hastelloy® C-276	316L SS	----- BB -----	•	•	
		Hastelloy® C-276	Hastelloy® C-276	----- BC -----	•	•	
		Monel 400®	Monel 400®	----- BE -----	•	•	
		Tantalum	316L SS	----- BF -----	1	1	
		Tantalum	Hastelloy® C-276	----- BG -----	1	1	
		Tantalum	Tantalum Clad	----- BH -----	10	10	
	Non-Wetted Material (upper, upper insert)	Upper	Upper Insert	Selection			
		316L SS	316L SS	----- 4 -----	•	•	
	Carbon Steel	316L SS	----- 5 -----	•	•		
	Bolts <sup>6</sup>	No Selection		----- 0 -----	•	•	
	Flushing Connections and Plugs <sup>4</sup>	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 -----	•	•		
		One 1/2" with metal plug	----- Q -----	•	•		
		Two 1/2" with plastic plugs	----- R -----	•	•		
		Two 1/2" with metal plugs	----- S -----	•	•		
	Gasket	Klinger® C-4401 (non-asbestos)		----- K -----	c	c	
		Grafoil®		----- G -----	•	•	
		Teflon®		----- T -----	c	c	
		Gylon® 3510		----- L -----	d	d	
<p>Flange Seal with Extended Diaphragm</p>	Diaphragm Diameter	Flange Size	Flange Pressure Rating <sup>1</sup>	Selection			
	2.8"	3" (2.8" 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	Ext. Tube	Selection			
		316L SS	316L SS	----- EA -----	•	•	
		Hastelloy® C-276	316L SS	----- EB -----	•	•	
	Hastelloy® C-276	Hastelloy® C-276	----- EC -----	•	•		
Flange Material	CS (Nickel Plated)		----- 7 -----	•	•		
	316L SS		----- 8 -----	•	•		
Bolts	No Selection		----- 0 -----	•	•		
Extension Length	2"		----- 2 -----	•	•		
	4"		----- 4 -----	•	•		
	6"		----- 6 -----	•	•		
No Selection	No Selection		----- 0 -----	•	•		

Table II continued next page

<sup>1</sup> Standard facing 125-250 AARH RF (raised face) serrated surface finish.

<sup>4</sup> Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

<sup>6</sup> Bolt material will be same as Upper Material. However, if Table III bolt/nut option is chosen, seal bolt material will be the same.

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

**TABLE II - SEALS (continued)**

Availability  
STR9xx ↓ ↓  
3D 4G



	Diaphragm Diameter	Flange Size	Flange Pressure Rating Dependent on Customer Flange <sup>1</sup>		Selection	3D	4G	
			Diaphragm	Body				Selection
 Pancake Seal 	3.5"	3"	ANSI Class 150/300/600		___ GFA ___	•	•	
	Wetted Material			316L SS	316L SS	___ GA ___	•	•
				Hastelloy® C-276	316L SS	___ GB ___	•	•
				Hastelloy® C-276	Hastelloy® C-276	___ GC ___	•	•
				Monel 400®	Monel 400®	___ GE ___	•	•
				Tantalum	Tantalum <sup>7</sup>	___ GG ___	1	1
	Non-Wetted Materials		No Selection		___ 0 ___	•	•	
	No Selection		No Selection		___ 0 ___	•	•	
	Calibration Rings		None		___ A ___	•	•	
			316L SS		___ B ___	5	5	
		Hastelloy® C-276		___ C ___	5	5		
		Monel 400®		___ D ___	5	5		
Flushing Connections and Plugs <sup>4</sup> <i>Metal plug material will be the same as Lower material, if metal plug is chosen - (SS Plug for CS Lower and Tantalum Clad)</i>		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

**TABLE II - SEALS (continued)**

Availability  
STR9xx ↓ ↓  
3D 4G


	Diaphragm Diameter	Flange Size	Flange Pressure Rating <sup>1</sup>		Selection	3D	4G	
			Diaphragm	Body				Selection
 Chemical Tee "Taylor" Wedge	3.5"	Taylor Wedge 5" O.D.	750 psi		___ HM0 ___	v		
	Wetted Material			316L SS	316L SS	___ HA ___	•	
				Hastelloy® C-276	316L SS	___ HB ___	•	
				Hastelloy® C-276	Hastelloy® C-276	___ HC ___	•	
	Non-Wetted Material		No Selection		___ 0 ___	•		
	Bolts		No Selection		___ 0 ___	•		
	Styles		No Selection		___ 0 ___	•		
No Selection		No Selection		___ 0 ___	•			

Table II continued next page

<sup>1</sup> Standard facing 125-250 AARH RF (raised face) serrated surface finish.


<sup>4</sup> Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

<sup>7</sup> Tantalum Body has Tantalum wetted parts and 316 SS non-wetted parts

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

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**TABLE II - SEALS (continued)**



	Diaphragm Diameter	Threaded Process Connection Size (NPT Female)	Seal Pressure Rating *		Selection	Availability		
			C.S. Bolts	304 SS Bolts		3D	4G	
								STR9xx
 <p>Seal with Threaded Process Connection</p>	2.4"	1/2 NPT	2,500 psi	1,250 psi	--- J J G ---	•	•	
		3/4 NPT			--- J K G ---	•	•	
		1 NPT			--- J L G ---	•	•	
	2.9"	1/2 NPT	2,500 psi	1,250 psi	--- K J G ---	•	•	
		3/4 NPT			--- K K G ---	•	•	
		1 NPT			--- K L G ---	•	•	
	4.1"	1/2 NPT	1,500 psi	750 psi	--- L J G ---	•	•	
		3/4 NPT			--- L K G ---	•	•	
		1 NPT			--- L L G ---	•	•	
	Wetted Material	<b>Diaphragm</b>	<b>Lower</b>		<b>Selection</b>			
		316L SS	Carbon Steel		--- J A ---	•	•	
		316L SS	316L SS		--- J B ---	•	•	
		Hastelloy® C-276	316L SS		--- J C ---	•	•	
		Hastelloy® C-276	Hastelloy® C-276		--- J D ---	•	•	
		Monel 400®	Monel 400®		--- J E ---	•	•	
		Tantalum	316L SS		--- J F ---	1	1	
		Tantalum	Hastelloy® C-276		--- J G ---	1	1	
	Non-Wetted Material (upper)	CS (Nickel Plated)			--- A ---	•	•	
		Stainless Steel			--- C ---	w	w	
	Bolts <sup>8</sup>	Carbon Steel			--- C ---	1	1	
304 SS			--- D ---	•	•			
Flushing Connections and Plugs <sup>4</sup> <i>Metal plug material will be the same as Lower material, if metal plug is chosen - (SS Plug for CS Lower and Tantalum Clad)</i>	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 ---	11	11		
	One 1/2" with metal plug			--- Q ---	11	11		
	Two 1/2" with plastic plugs			--- R ---	11	11		
Two 1/2" with metal plugs			--- S ---	11	11			
Gasket	Klinger® C-4401 (non-asbestos)			--- K ---	c	c		
	Grafoil®			--- G ---	•	•		
	Teflon®			--- T ---	c	c		
	Gylon® 3510			--- L ---	d	d		

<sup>4</sup> Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

<sup>8</sup> If Table III Bolt/Nut option is chosen, Seal bolts will ship as same material, and MAWP may change.

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

TABLE II - SEALS (continued)

		Diaphragm Diameter	Flange Size	Pressure Rating		Selection	Availability	
							3D	4G
 <p>Sanitary Seal <sup>9</sup></p>	1.9"	2"	Customer clamp rating or 600 psi, whichever is less		___ MD0 ___	25	24	
	2.4"	2-1/2"			___ NE0 ___	24	24	
	2.9"	3"			___ PF0 ___	24	24	
	4.1"	4"			___ QG0 ___	24	24	
	Wetted Material		Diaphragm		Body	Selection		
			316L SS		316L SS	___ N A ___	•	•
	Non-Wetted Material		No Selection			___ 0 ___	•	•
	Bolts		No Selection			___ 0 ___	•	•
Styles		Tri-Clover Tri-Clamp <sup>®</sup>			___ 8 ___	•	•	
Gasket		No Selection			___ 0 ___	•	•	
 <p>Saddle Seal</p>	Diaphragm Diameter	Size and Bolt Pattern	Seal Pressure Rating **		Selection			
			C.S. Bolts	304 SS Bolts				
	2.4" 8-Bolt Design	for 3" Pipe ≥ 4" pipe	1,500 psi	1,500 psi	___ RFK ___	•	•	
					___ RGK ___	•	•	
	2.4" 6-Bolt Design	for 3" Pipe ≥ 4" pipe	1,250 psi	1,250 psi	___ RPK ___	•	•	
					___ RQK ___	•	•	
	Wetted Material		Diaphragm	Lower Housing		Selection		
			316L SS	Carbon Steel		___ RA ___	•	•
			316L SS	316L SS		___ RB ___	•	•
			Hastelloy <sup>®</sup> C-276	316L SS		___ RC ___	•	•
			Hastelloy <sup>®</sup> C-276	Hastelloy <sup>®</sup> C-276		___ RD ___	•	•
			316L SS	N/A-Body Only <sup>10</sup>		___ SB ___	•	•
		Hastelloy <sup>®</sup> C-276	N/A-Body Only <sup>10</sup>		___ SC ___	•	•	
Non-Wetted Material		Body	Bolts <sup>8, 10</sup>		Selection			
		Carbon Steel	Carbon Steel		___ B ___	1	1	
		316L SS	304 SS		___ C ___	•	•	
No Selection		No Selection			___ 0 ___	•	•	
Styles		No Selection			___ 0 ___	•	•	
Gasket		Klinger <sup>®</sup> C-4401 (non-asbestos)			___ K ___	•	•	
		Grafoil <sup>®</sup>			___ G ___	•	•	
		Teflon <sup>®</sup>			___ T ___	•	•	
		Gylon <sup>®</sup> 3510			___ L ___	•	•	

<sup>8</sup> If Table III Bolt/Nut option is chosen, Seal bolts will ship as same material, and MAWP may change.

<sup>9</sup> All sanitary seals have dairy grade 3A approval.

<sup>10</sup> Bolts are not included with "body only" selection.

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

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TABLE III - OPTIONS	STR9xx Selection	Availability		
		3D	4G	
<b>Communication Options</b> (Must choose a communications option)				
Analog only (can be configured using appropriate Honeywell DE tool)	AN	•	•	b
DE Protocol communications	DE	•	•	
HART® 5.x Protocol compatible electronics	HC	•	•	
HART® 6.x Protocol compatible electronics	H6	•	•	
FOUNDATION™ Fieldbus Communications	FF	r	r	
<b>Indicating Meter Options</b>				
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	
<b>Transmitter Housing &amp; Electronics Options</b>				
No housing conduit plugs or adaptors come standard with the ST 3000. For certain approval codes, you <b>must</b> select a certified conduit plug from below and it will come packaged in the box with your transmitter.				
316 SS <sup>5</sup> Electronics Housing - (with M20 Conduit Connections)	SH	n	n	b
316 SS <sup>5</sup> Electronics Housing - (with M20 to 1/2 NPT 316 SS Conduit Adapter for use with FM and CSA Approval codes)	A3	i	i	
1/2 NPT Male to M20 Female 316 SS Certified Conduit Adapter (ATEX, CSA & IECEx)	A1	•	•	
1/2 NPT Male to 3/4 NPT Female 316 SS Certified Conduit Adapter (ATEX, CSA & IECEx)	A2	•	•	
M20 Male to 1/2 NPT Female 316 SS Certified Conduit Adaptor (ATEX, CSA & IECEx)	A4	•	•	
1/2 NPT Zinc-plated Certified Conduit Plug (ATEX, CSA & IECEx)	A5	•	•	
1/2 NPT 316 SS Certified Conduit Plug (ATEX, CSA & IECEx)	A6	•	•	
M20 316 SS Certified Conduit Plug (ATEX, CSA & IECEx)	A7	•	•	
1/2 NPT Non-certified Conduit plug (Zinc-plated carbon steel, general use)	A8	•	•	
NAMUR Failsafe Software	NE	15	15	
SIL 2 - TÜV Certified transmitter (requires HC or H6 and WP options)	SL	14	14	
Lightning Protection	LP	•	•	
Custom Calibration and I.D. in Memory	CC	•	•	
Transmitter Configuration - (non-Fieldbus)	TC	15	15	
Transmitter Configuration - (Fieldbus)	FC	21	21	
Write Protection (Delivered in the "enabled" position)	WP	•	•	b
Write Protection (Delivered in the "disabled" position)	WX	•	•	
Stainless Steel Customer Wired-On Tag (4 lines, 26 characters per line, customer supplied information)	TG	•	•	
Stainless Steel Customer Wired-On Tag (blank)	TB	•	•	
<b>Meter Body Options</b> (Carbon Steel standard)				
A286 SS (NACE) Bolts and 304 SS (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	•	•	
<b>Remote Seal Options</b>				
Gold Plated Seal Diaphragm (1 Seal)	G1	j	j	b
Gold Plated Seal Diaphragm (2 Seals)	G2	j	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	j	
<b>Transmitter Mounting Bracket Options</b>				
Angle Mounting Bracket - Carbon Steel	MB	•	•	b
Marine Approved Angle Mounting Bracket - Carbon Steel	MX	•	•	
Angle Mounting Bracket - 304 SS	SB	•	•	
Marine Approved Angle Mounting Bracket - 304 SS	SX	•	•	
Flat Mounting Bracket - Carbon Steel	FB	•	•	
<b>Services/Certificates Options</b>				
Users Manual Paper Copy (Standard, HC/H6 or FF ships accordingly)	UM	•	•	b
Clean Transmitter & Seals for Oxygen or Chlorine Service with Certificate	0X	h	h	
Over-Pressure Leak Test with Certificate (F3392)	TP	•	•	
Calibration Test Report and Certificate of Conformance (F3399)	F1	•	•	
Certificate of Conformance (F3391)	F3	•	•	
Certificate of Origin (F0195)	F5	•	•	
SIL Certificate (SIL 2/3) (FC33337)	FE	22	22	
NACE Certificate (Process-Wetted & Non-Process Wetted) (FC33339)	F7	o	•	
NACE Certificate for welded meter bodies only (F0198)	F8	16	•	
NACE Certificate (Process-Wetted) (FC33338)	FG	•	•	
Material Traceability Certification per EN 10204 3.1 (FC33341)	FX	•	•	
Marine Type Approvals (DNV, ABS, BV, KR & LR)	MT	2	2	

Table III continued next page

<sup>5</sup> Supplied as 316 SS or as Grade CF8M, the casting equivalent of 316 SS.

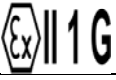







TABLE III - OPTIONS (continued)		STR9xx Selection	3D	4G	
<b>Warranty Options</b>					
Additional Warranty - 1 year		W1	•	•	
Additional Warranty - 2 years		W2	•	•	
Additional Warranty - 3 years		W3	•	•	
Additional Warranty - 4 years		W4	•	•	
<b>Approval Body</b>	<b>Approval Type</b>	<b>Location or Classification</b>	<b>Selection</b>	<b>3D</b> <b>4G</b>	
No hazardous location approvals			9X	• •	
FM Approvals <sup>SM</sup>	Explosion Proof	Class I, Div. 1, Groups A,B,C,D	1C	• •	
	Dust-Ignitionproof	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			
ATEX <sup>10</sup> (LCIE)	Intrinsically Safe, Zone 0	 <b>Ex ia IIC</b> T4 (Ta = -50°C to +93°C); T5 (Ta = -50°C to +85°C); T6 (Ta = -50°C to +70°C) Enclosure IP 66/67	3S	• •	
	Intrinsically Safe, Zone 1	 <b>Ex ia IIC</b> T4 (Ta = -50°C to +93°C); T5 (Ta = -50°C to +85°C); T6 (Ta = -50°C to +70°C) Enclosure IP 66/67			
	Dust-tight Enclosure, Zone 0	 <b>Ex tD A20 IP6X</b> T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C)) Enclosure IP 66/67	33	26	26
	Flameproof and Dust-tight Enclosure, Zone 1	 <b>Ex d IIC</b> T5 (Ta = -40°C to +93°C), T6 (Ta = -40°C to +78°C) Supply 11- 42Vdc <b>Ex tD A21 IP6X</b> T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C) Enclosure IP 66/67			
	Non-Sparking, Zone 2	 <b>Ex nA, IIC</b> T5 (Ta = -40°C to +93°C), T6 (Ta = -40°C to +78°C); Zone 2 Supply < 42Vdc, 23mA <b>Ex tD A22 IP6X</b> T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C) (Honeywell). Enclosure IP 66/67			
	Multiple Marking <sup>11</sup> Int. Safe, Zone 0/1 and Dust-tight Enclosure, or Flameproof, Zone 1 and and Dust-tight Enclosure, or Non-Sparking, Zone 2	 <b>Ex ia IIC</b> T4 (Ta = -50°C to +93°C); T5 (Ta = -50°C to +85°C); T6 (Ta = -50°C to +70°C); Ui = 30V; Ii = 100mA <b>Ex tD A20 IP6X</b> T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C)	3C	26	26
 <b>Ex d IIC</b> T5 (Ta = -40°C to +93°C), T6 (Ta = -40°C to +78°C) Supply 11- 42Vdc <b>Ex tD A21 IP6X</b> T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C)					
 <b>Ex nA, IIC</b> T5 (Ta = -40°C to +93°C), T6 (Ta = -40°C to +78°C); Zone 2 Supply < 42Vdc, 23mA <b>Ex tD A22 IP6X</b> T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C) (Honeywell) Enclosure IP 66/67					

Table III Approvals continued next page

STR9xx      ↓      ↓

**TABLE III - Approvals Options (continued)**

Approval Body	Approval Type	Location or Classification	Selection	3D	4G
Canadian Standards Association (CSA)	Explosion Proof	Class I, Div. 1, Groups B,C,D	2J	26	26
	Dust-Ignitionproof	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			
IECEX	Flameproof, Zone 1	<b>Ex d IIC;</b> T5 (Ta = -40 to +93°C), T6 (Ta = -40 to +78°C)	CA	26	26
	Intrinsically Safe, Zone 0/1	<b>Ex ia IIC;</b> T3, T4, T5, T6 See Spec for detailed temperature codes by Communications option			
SAEx (South Africa)	Intrinsically Safe, Zone 0/1	<b>Ex ia IIC</b> T4, T5, T6	Z2	•	•
	Flameproof, Zone 1	<b>Ex d IIC</b> T5, T6 Enclosure IP 66/67	ZD	•	•
	Multiple Marking <sup>11</sup> Int. Safe, Zone 0/1, or Flameproof, Zone 1	<b>Ex ia IIC</b> T4, T5, T6 <b>Ex d IIC</b> T5, T6 Enclosure IP 66/67	ZA	•	•
CERTUSP INMETRO (Brazil)	Flameproof, Zone 1	<b>BR- Ex d IIC</b> T5, T6	6D	•	•
	Intrinsically Safe, Zone 0/1	<b>BR- Ex ia IIC;</b> T4, T5, T6 (See CERTUSP certificate for detailed temperature codes by Communications option)	6S	•	•

<sup>10</sup> See ATEX installation requirements in the ST 3000 User's Manual

<sup>11</sup> The user must determine the type of protection required for installation of the equipment. The user shall then check the box [x] adjacent to the type of protection used on the equipment certification nameplate. Once a type of protection has been checked on the nameplate, subsequently the equipment shall not be reinstalled using any of the other certification types.

**TABLE IV**

Factory Identification	Selection		
	X X X X	•	•

**RESTRICTIONS**

Restriction Letter	Available Only With		Not Available With	
	Table	Selection	Table	Selection
<b>b</b>		Select only one option from this group		
<b>c</b>			II	----- BF ----- ----- BG ----- ----- BH ----- ----- JF ----- ----- JG -----
<b>d</b>	II	----- BF ----- ----- BG ----- ----- JF ----- ----- JG -----		
<b>h</b>	I, II	2 - 2		
<b>i</b>	III	1C or 2J		
<b>j</b>			II	----- AF ----- ----- BF ----- ----- BG ----- ----- BH ----- ----- GG ----- ----- JF ----- ----- JG -----
<b>m</b>	III	SM		
<b>n</b>			III	1C, 2J
<b>o</b>	III	CR		
<b>q</b>	II	0 ----- 2 ----- 4 -----		
<b>r</b>	III	FISCO/FNICO compliance available only with 1C	III	TC, ME or FISCO/FNICO compliance not available with 3C, 3N, 33, 3S, 2J, CA, Z2, ZD, ZA, 6D & 6S
<b>s</b>			III	FF, ME
<b>v</b>	I	2		
<b>w</b>			II	----- JA -----
<b>x</b>	III	FF, SM		

Restrictions continued next page

## RESTRICTIONS - (continued)

Restriction Letter	Available Only With		Not Available With	
	Table	Selection	Table	Selection
y			I III	2 MB, SB, FB
	II	2 _____		
z	I	___ D		
1			III	F7
2	III	MX, SX	III	FB, MB, SB
3	I	5 __		
5			II	_____ 0
6			II	_____ A
7			I III	1, 3 CR
			III	CC, G1, G2, N1, N2, 0X, TP, MT, F1, TC, FC
9	II	_____ AA2 _____ AB2		
10	II	_____ 0	II	_____ T
			III	F7
11			II	_____ JJG
				_____ JKG
				_____ JLG
				_____ CAA
				_____ CCA
				_____ CCC
14	III	HC or H6 and WP	III	FF
15			III	FF
16	I	___ C		
21	III	FF		
22	III	SL		
24	III		I & II	2 - 2 _____
25	II	_____ A _____,		
		_____ G _____,		
		_____ 2 _____		
26	III	This approval code requires the selection of a certified conduit plug: A5, A6 or A7		

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*Specifications are subject to change without notice.*

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