Technical Information

Honeywell

ST 3000 Smart Transmitter Series 100 Remote Diaphragm Seals Models Specifications
34-ST-03-64 March 2013

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 100 Remote Seal Transmitters continue to bring proven “smart” technology to a wide spectrum of measurement applications. Typical applications include high accuracy level measurement in pressurized vessels in the chemical and hydrocarbon processing industries. A second application consists of accurate flow measurement for slurries and high viscosity fluids in the chemical industry. Honeywell remote seal transmitters demonstrate proven reliability in hundreds on installations in a wide variety of industries and applications with a wide variety of secondary fill fluids for corrosive or high temperature process fluids.

Models		
STR12D	0-4 to 0-400 inH_2O	0-10 to 0-1,000 mbar
STR13D	0-1 to 0-100 psid	0-0.07 to 0-7 bar
STR14G	0-5 to 0-500 psig	0-0.35 to 0-35 bar
STR17G	0-30 to 0-3,000 psig	2.1 to 0-210 bar
STR14A	0-5 to 0-500 psia	0-0,35 to 0-35 bara

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

Figure 1 — Series 100 Remote Seal Pressure Transmitters feature proven piezoresistive sensors and advanced seal technology with standard weld connections.

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 high-performance ST 3000 S100 transmitters lead the industry in:

- Accuracy
- Stability
- Reliability
- Rangeability
- Warranty

ST3000 S900 Transmitter Benefits
Total Accuracy = ±0.0375%
Stability = ±0.01% per year
Reliability = 470 years MTBF
Rangeability = 400 to 1
Lifetime Warranty = 15 years

The devices provide comprehensive self-diagnostics to help users maintain high uptime, meet regulatory requirements, and attain high quality standards. S100 transmitters are ideal for critical applications, such as custody transfer of natural gas and energy and material balances, where accuracy and stability are of the utmost importance.

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 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 ½”, ¾” 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.

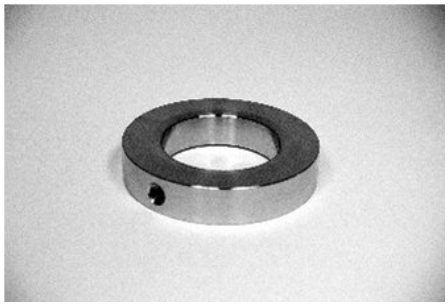


Figure 9— Calibration Rings

Calibration Rings are available with Flush Flange Seals and Pancake Seals. Flushing ports (1/4” or ½”) 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
Ambient Temperature*	25±1	77±2	-	-	-	-	-55 to 90	-67 to 194
Humidity %RH	10 to 55		0 to 100		0 to 100		0 to 100	
Vacuum Region, Minimum Pressure mmHg absolute	Atmospheric (See Figure 15 for vacuum limitation.							
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 1,440 ohms (as shown in Figure 16)							
Maximum Allowable Working Pressure (MAWP)[4] (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) **Body** **MAWP** STR12D 2,500 psig (172 bar) Bolted Process Heads Table I _ _ A STR13D 2,500 psig (172 bar) Bolted Process Heads Table I _ _ A STR12D 1,450 psig (100 bar) All Welded Process Heads Table I _ _ C STR13D 1,450 psig (100 bar) All Welded Process Heads Table I _ _ C STR14G 500 psig (35 bar) STR17G 3,000 psig (207 bar) STR14A 500 psia (35 bara)							

* Ambient Temperature Limit is a function of Process Interface Temperature. (See Figure 13.)

[3] 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.

[4] Consult factory for MAWP of ST 3000 transmitters with CSA approval.

Performance Under Rated Conditions* - Model STR12D (4 to 0-400 inH_2O)

Parameter	Description
Upper Range Limit** **inH_2O** **mbar**	400 (39.2°F/4°C is standard reference temperature for inH_2O range.) 1,000
Minimum Span **inH_2O** **mbar**	4 Note: Recommended minimum span in square root mode is 20 inH_2O (50 mbar). 10
Turndown Ratio	100 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: $\pm\left[0.10+0.10\left(\frac{50\ inH_2O}{span\ inH_2O}\right)\right]$ or $\pm\left[0.10+0.10\left(\frac{125\ mbar}{span\ mbar}\right)\right]$ in % of 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: $\pm\left[0.075+0.10\left(\frac{50\ inH_2O}{span\ inH_2O}\right)\right]$ or $\pm\left[0.075+0.10\left(\frac{125\ mbar}{span\ mbar}\right)\right]$ in % of span
Combined Zero and Span Temperature Effect per 28°C (50°F)**	**In Analog Mode:** ±1.2% of span. For URV below reference point (200 inH_2O), effect equals: $\pm\left[0.20+0.10\left(\frac{200\ inH_2O}{span\ inH_2O}\right)\right]$ or $\pm\left[0.20+0.10\left(\frac{500\ mbar}{span\ mbar}\right)\right]$ in % of span **In Digital Mode:** ±1.175% of span. For URV below reference point (200 inH_2O), effect equals: $\pm\left[0.175+1.0\left(\frac{200\ inH_2O}{span\ inH_2O}\right)\right]$ or $\pm\left[0.175+1.0\left(\frac{500\ mbar}{span\ mbar}\right)\right]$ 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.

** Transmitter URL limit or maximum seal pressure rating, whichever is lower.

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

Performance Under Rated Conditions* - Model STR13D (1 to 0-100 psid)

Parameter	Description
Upper Range Limit** **psid** **bar**	100 7
Minimum Span **psid** **bar**	1 0.07
Turndown Ratio	100 to 1
Zero Elevation and Suppression	No limit except minimum span within –18% and +100% of URL. Specifications valid from –5% to 100% of URL.
Accuracy (Reference – Includes combined effects of linearity, hysteresis, and repeatability) • *Stated accuracy **does not** apply for models with 2.9 inch diameter remote seal diaphragms.* • *Accuracy includes residual error after averaging successive readings.* • *For FOUNDATION™ Fieldbus use Digital Mode specifications.* • *For HART® use Analog Mode specifications.*	**In Analog Mode:** ±0.1% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (30 psi), accuracy equals: $\pm\left[0.05+0.05\left(\frac{30\ \text{psi}}{\text{span psi}}\right)\right]$ or $\pm\left[0.05+0.05\left(\frac{2\ \text{bar}}{\text{span bar}}\right)\right]$ in % of span **In Digital Mode:** ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (30 psi), accuracy equals: $\pm\left[0.025+0.05\left(\frac{30\ \text{psi}}{\text{span psi}}\right)\right]$ or $\pm\left[0.025+0.05\left(\frac{2\ \text{bar}}{\text{span bar}}\right)\right]$ in % of span
Combined Zero and Span Temperature Effect per 28°C (50°F)**	**In Analog Mode:** ±0.33% of span. For URV below reference point (60 psi), effect equals: $\pm\left[0.05+0.20\left(\frac{60\ \text{psi}}{\text{span psi}}\right)\right]$ or $\pm\left[0.05+0.28\left(\frac{4\ \text{bar}}{\text{span bar}}\right)\right]$ in % of span **In Digital Mode:** ±0.305% of span. For URV below reference point (60 psi), effect equals: $\pm\left[0.025+0..25\left(\frac{60\ \text{psi}}{\text{span psi}}\right)\right]$ or $\pm\left[0.025+0.28\left(\frac{4\ \text{bar}}{\text{span bar}}\right)\right]$ 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.

** Transmitter URL limit or maximum seal pressure rating, whichever is lower.

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

Performance Under Rated Conditions* - Model STR14G (0-5 to 0-500 psig)

Parameter	Description
Upper Range Limit** **psig** **bar**	500 35
Minimum Span **psig** **bar**	5 0.35
Turndown Ratio	100 to 1
Zero Elevation and Suppression	No limit except minimum span from absolute zero to 100% of URL. Specifications valid over this range.
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:** ±0.1% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (20 psi), accuracy equals: $\pm\left[0.05+0.05\left(\frac{20\ \text{psi}}{\text{span}\ \ \text{psi}}\right)\right]$ or $\pm\left[0.05+0.05\left(\frac{1.4\ \text{bar}}{\text{span}\ \ \text{bar}}\right)\right]$ in % of span **In Digital Mode:** ±0.075% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (20 psi), accuracy equals: $\pm\left[0.025+0.05\left(\frac{20\ \text{psi}}{\text{span}\ \ \text{psi}}\right)\right]$ or $\pm\left[0.025+0.05\left(\frac{1.4\ \text{bar}}{\text{span}\ \ \text{bar}}\right)\right]$ 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.
** URL limit or maximum seal pressure rating, whichever is lower.

Performance Under Rated Conditions* - Model STR17G (0-30 to 0-3,000 psig)

Parameter	Description
Upper Range Limit** **psig** **bar**	3,000 210
Minimum Span **psig** **bar**	30 2.1
Turndown Ratio	100 to 1
Zero Elevation and Suppression	No limit except minimum span from absolute zero to 100% of URL. Specifications valid over this range.
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:** ±0.15% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (300 psi), accuracy equals: $\pm\left[0.10+0.05\left(\frac{300\ \text{psi}}{\text{span}\ \ \text{psi}}\right)\right]$ or $\pm\left[0.10+0.05\left(\frac{21\ \text{bar}}{\text{span}\ \ \text{bar}}\right)\right]$ in % of span **In Digital Mode:** ±0.125% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (300 psi), accuracy equals: $\pm\left[0.075+0.05\left(\frac{300\ \text{psi}}{\text{span}\ \ \text{psi}}\right)\right]$ or $\pm\left[0.075+0.05\left(\frac{21\ \text{bar}}{\text{span}\ \ \text{bar}}\right)\right]$ 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.
** Transmitter URL limit or maximum seal pressure rating, whichever is lower.

Performance Under Rated Conditions* - STR14A (0-5 to 0-500 psia)

Parameter	Description
Upper Range Limit **psia** **bar absolute**	****** 500 35
Minimum Span **psia** **bar absolute**	5 0.35
Turndown Ratio	100 to 1
Zero Elevation and Suppression	No limit except minimum span from 0 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:** ±0.1% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (20 psi), accuracy equals: $\pm\left[0.05+0.05\left(\frac{20\ \text{psi}}{\text{span}\ \ \text{psi}}\right)\right]$ or $\pm\left[0.05+0.05\left(\frac{1.4\ \text{bar}}{\text{span}\ \ \text{bar}}\right)\right]$ in % of span **In Digital Mode:** ±0.075% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (20 psi), accuracy equals: $\pm\left[0.025+0.05\left(\frac{20\ \text{psi}}{\text{span}\ \ \text{psi}}\right)\right]$ or $\pm\left[0.025+0.05\left(\frac{1.4\ \text{bar}}{\text{span}\ \ \text{bar}}\right)\right]$ 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.

** Transmitter URL limit or maximum seal pressure rating, whichever is lower.

Performance Under Rated Conditions – General for all Models

Parameter	Description
Output (two-wire)	Analog 4 to 20 mA or digital communications DE mode. Options available for Foundation™ Fieldbus and HART® protocol.
Supply Voltage Effect	±0.005% of span per volt.
Damping Time Constant	Adjustable from 0 to 32 seconds digital damping.
RFI Protection (Standard)	Negligible (20 to 1,000 MHz at 30 volts per meter).
CE Conformity (Europe)	89/336/EEC, Electromagnetic Compatibility (EMC) Directive.
NAMUR NE 43 Compliance (Option "NE")	Transmitter failure information is generated when the measuring information is invalid or no longer present. Failure information is transmitted as a current signal but outside the normal 4-20 mA measurement signal level. Transmitter failure values are: ≤ 3.6 mA and ≥ 21.0 mA. The normal signal range is ≥ 3.8 mA and ≤ 20.5 mA.
SIL 2/3 Compliance	SIL certified to IEC 61508 for non-redundant use in SIL 2 related Safety Systems (single use) and for redundant (multiple) use in SIL 3 Safety Systems through TÜV Nord Sys Tec GmbH & Co. KG under the following standards: IEC61508-1: 1998; IEC 61508-2: 2000; IEC61508-3: 1998.

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-Chromate plated) or Stainless Steel.
Fill Fluid (Meter Body)	Silicone (DC® 200) S.G. @ 25°C = 0.94 CTFE (Chlorotrifluoroethylene) S.G. @ 25°C = 1.89
Fill Fluid (Secondary)*	Silicone (DC® 200) S.G. @ 25°C = 0.94 CTFE (Chlorotrifluoroethylene) S.G. @ 25°C = 1.89 Silicone Oil 704 S.G. @ 25°C = 1.07 Syltherm 800® S.G. @ 25°C = 0.90 NEOBEE M-20® S.G. @ 25°C = 0.93
Electronic Housing	Epoxy-Polyester hybrid paint. Low copper-aluminum alloy. Meets NEMA 4X (watertight) and NEMA 7 (explosion proof). Stainless steel optional.
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 10.7 meters). A 2 inch (51 millimeter) S.S. close-coupled nipple is also available. See Model Selection Guide. Refer to Figure 14 for guide to maximum capillary length vs. diaphragm diameter.
Wiring	Accepts up to 16 AWG (1.5 mm diameter).
Mounting	See Figure 17.
Dimensions	**Transmitter:** See Figures 20a and 20b. **Seal:** See Figures 21 through 31.
Net Weight	**Transmitter:** 15.4 pounds (7 Kg). Total weight is dependent on seal type and 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.

[1] Vent/Drains are sealed with Teflon® or PTFE
[2] Hastelloy® C-276 or UNS N10276
[3] Monel 400® or UNS N04400
[4] Supplied as 316 SS or as Grade CF8M, the casting equivalent of 316 SS.
[5] Carbon Steel heads are zinc-plated and not recommended for water service due to hydrogen migration. For that service, use 316 stainless steel wetted Process Heads.
[6] Hastelloy® C-276 or UNS N10276. Supplied as indicated or as Grade CW12MW, the casting equivalent of Hastelloy® C-276
[7] Monel 400® or UNS N04400. Supplied as indicated or as Grade M30C, the casting equivalent of Monel 400®

Certifications

	Type of Protection	Comm. Option	Field Parameters	Temperature Codes
FM Approvals[SM]	**Explosionproof:** Class I, Division 1, Groups A, B, C, D locations **Dust Ignition Proof:** Class II, III, Division 1, Groups E, F, G locations, Enclosure Type 4X	All	All	T5 Ta = 93ºC
	Intrinsically Safe: 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 = 93ºC
		4-20 mA / HART®	Vmax = 30V Imax = 225mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = 93ºC
	Intrinsically Safe: 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 = 40ºC T3 Ta = 93ºC
		Fieldbus – Entity (Not FISCO)	Vmax = 24V Imax = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T4 Ta = 40ºC T3 Ta = 93ºC
		FISCO	Vmax = 17.5V Imax = 380mA Ci = 4.2nF Li = 0 Pi =5.32W	T4 Ta = 40ºC T3 Ta = 93ºC
	Nonincendive: 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 = 93ºC
		4-20 mA / HART	Vmax = 30V Imax = 225mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = 93ºC
	Nonincendive: 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 = 40ºC T3 Ta = 93ºC
		Fieldbus – Entity (Not FNICO)	Vmax = 24V Imax = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T4 Ta = 40ºC T3 Ta = 93ºC
		FNICO	Vmax = 32V Ci = 4.2nF Li = 0	T4 Ta = 40ºC T3 Ta = 93ºC

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

FM Approvals[SM] is a service mark of FM Global

	Type of Protection	Comm. Option	Field Parameters	Temp. Codes
Canadian Standards Association (CSA)	**Explosion Proof:** Class I, Division 1, Groups B, C, D locations **Dust Ignition Proof:** Class II, III, Division 1, Groups E, F, G locations, Enclosure Type 4X	All	All	T4 Ta = 93ºC
	Intrinsically Safe: 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 = 93ºC
		4-20 mA / HART®	Vmax = 42V Imax = 225mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = 93ºC
		Fieldbus – Entity (Not FISCO)	Vmax = 24V Imax = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T4 Ta = 40ºC T3 Ta = 93ºC
	Nonincendive: 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 = 93ºC
		4-20 mA / HART®	Vmax = 30V Imax = 225mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = 93ºC
		Fieldbus – Entity (Not FNICO)	Vmax = 24V Imax = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T4 Ta = 40ºC T3 Ta = 93ºC
	Canadian Registration Number (CRN):	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
IECEx International Electrotechnical Commission (LCIE)	**Flameproof, Zone 1:** Ex d IIC, Enclosure IP 66/67	All	All	T5 Ta = –50 to 93ºC T6 Ta = –50 to 78ºC
	Intrinsically Safe, Zone 0/1: 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 93ºC T5 Ta = –50 to 85ºC T6 Ta = –50 to 70ºC
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = –50 to 93ºC T5 Ta = –50 to 63ºC T6 Ta = –50 to 48ºC
		Fieldbus (Not FISCO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T3 Ta = –50 to 93ºC T4 Ta = –50 to 40ºC

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

	Type of Protection	Comm. Option	Field Parameters	Temp. Codes
SAEx (South Africa)	**Flameproof, Zone 1:** Ex d IIC, Enclosure IP 66/67	All	All	T5 Ta = –50 to 93ºC T6 Ta = –50 to 78ºC
	Intrinsically Safe, Zone 0/1: 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 93ºC T5 Ta = –50 to 85ºC T6 Ta = –50 to 70ºC
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = –50 to 93ºC T5 Ta = –50 to 63ºC T6 Ta = –50 to 48ºC
		Fieldbus (Not FISCO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T3 Ta = –50 to 93ºC T4 Ta = –50 to 40ºC
	Multiple Marking: **Flameproof, Zone 1:** Ex d IIC, Enclosure IP 66/67 **Intrinsically Safe, Zone 0/1:** 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 Ii = 100mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = –50 to 93ºC T5 Ta = –50 to 85ºC T6 Ta = –50 to 70ºC
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = –50 to 93ºC T5 Ta = –50 to 63ºC T6 Ta = –50 to 48ºC
		Fieldbus (Not FISCO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T3 Ta = –50 to 93ºC T4 Ta = –50 to 40ºC

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

	Type of Protection	Comm. Option	Field Parameters	Temp. Codes
ATEX (LCIE)	**Flameproof, Zone 0:** ⟨Ex⟩ II 1 D, Ex tD Enclosure IP 66/67	All	All	A20 IP6X T95ºC Ta = 93ºC or T80ºC Ta = 78ºC
	Flameproof, Zone 1: ⟨Ex⟩ II 2 GD, Ex d IIC, Ex tD Enclosure IP 66/67	All	All	T5 Ta = –50 to +93ºC T6 Ta = –50 to +78ºC, A21 IP6X T95ºC Ta = 93ºC or T80ºC Ta = 78ºC
	Intrinsically Safe, Zone 0/1: ⟨Ex⟩ 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 93ºC T5 Ta = –50 to 85ºC T6 Ta = –50 to 70ºC
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = –50 to 93ºC T5 Ta = –50 to 63ºC T6 Ta = –50 to 48ºC
		Fieldbus (Not FISCO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T3 Ta = –50 to 93ºC T4 Ta = –50 to 40ºC
	Non-Sparking, Zone 2: ⟨Ex⟩ 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 93ºC T5 Ta = –50 to 85ºC T6 Ta = –50 to 70ºC
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = –50 to 93ºC T5 Ta = –50 to 63ºC T6 Ta = –50 to 48ºC
		Fieldbus (Not FNICO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T3 Ta = –50 to 93ºC T4 Ta = –50 to 40ºC
	Multiple Marking: **Flameproof, Zone 1:** ⟨Ex⟩ II 2 G, Ex d IIC **Intrinsically Safe, Zone 0/1:** ⟨Ex⟩ II 1 G, Ex ia IIC **Non-Sparking, Zone 2:** ⟨Ex⟩ II 3 G, Ex nA IIC **NOTE:** 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 93ºC T5 Ta = –50 to 85ºC T6 Ta = –50 to 70ºC
		4-20 mA / HART	Ui = 30V Ii = 100mA Ci = 4.2nF Li = * Pi =1.2W	T4 Ta = –50 to 93ºC T5 Ta = –50 to 63ºC T6 Ta = –50 to 48ºC
		Fieldbus (Not FISCO/FNICO)	Ui = 24V Ii = 250mA Ci = 4.2nF Li = 0 Pi =1.2W	T3 Ta = –50 to 93ºC T4 Ta = –50 to 40ºC

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

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

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

ST 3000 Pressure Transmitter Marine Certificate (MT Option)	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 Multivarible Transmitter
	American Bureau of Shipping (ABS) - 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
	Bureau Veritas (BV) - Product Code: 389:1H. Certificate number: 12660/B0 BV
	Det Norske Veritas (DNV) - 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
	Korean Register of Shipping (KR) - Certificate number: LOX17743-AE001
	Lloyd's Register (LR) - Certificate number: 02/60001(E1) & (E2)

European Pressure Equipment Directive (PED) (97/23/EC)	The ST 3000 Smart Pressure Transmitters are in conformity with the essential requirements of the Pressure Equipment Directive. 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. For transmitters rated > 200 bar (2,900 psig) < 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.
	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. 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 www.honeywell.com. A hard copy may be obtained by contacting a Honeywell representative.
CE Mark	***Electro Magnetic Compatibility (EMC) (2004/108/EC)*** All Models: EN 50081-1: 1992; EN 50082-2:1995; EN 61326-1:1997 + A1, A2, and A3 – Industrial Locations
Dual Seal Certification	Dual Seal Certification based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.01 requirements without the use of additional seal protection elements.
Recommended Frequency of Calibration	Honeywell recommends verifying the calibration of these devices once every four years.
Approved Manufacturing Locations	Honeywell Process Solutions - York, PA USA Honeywell (Tianjin) Limited – Tianjin, P.R. China Honeywell Automation India Ltd – Pune 411013 India

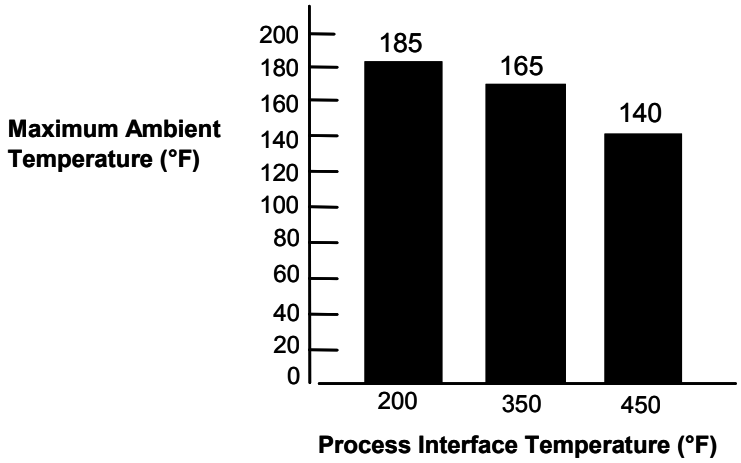


Figure 13—Ambient temperature and process interface chart

Transmitter Minimum Span and Maximum Capillary Length

Minimum recommended span for STR12D and STR13D DP Transmitter with two Remote Seals

Diaphragm	Capillary						Capillary Length
Size	5'	10'	15'	20'	30'	35'	maximum
2.4	200 iwc	-	-	-	-	-	5'
2.9	100 iwc	125 iwc	150 iwc	175 iwc	-	-	20'
3.5	16 iwc	20 iwc	24 iwc	28 iwc	36 iwc	40 iwc	35'
4.1	12 iwc	15 iwc	18 iwc	21 iwc	27 iwc	30 iwc	35'

Minimum recommended span for STR12D and STR13D DP Transmitter with one Remote Seal

Diaphragm	Direct	Capillary						Capillary Length
Size	Mount	5'	10'	15'	20'	30'	35'	maximum
2.4	20 psig	30 psig	-	-	-	-	-	5'
2.9	10 psig	15 psig	20 psig	25 psig	30 psig	-	-	20'
3.5	50 iwc	80 iwc	100 iwc	120 iwc	140 iwc	180 iwc	200 iwc	35'
4.1	40 iwc	60 iwc	80 iwc	100 iwc	120 iwc	160 iwc	180 iwc	35'

Minimum recommended span for STR14G, STR14A, STR17G Transmitter with 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	5 psi	5 psi	5 psi	5 psi	5 psi	7 psi	8 psi	35'
4.1	5 psi	5 psi	5 psi	5 psi	5 psi	7 psi	8 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 14 – Typical Maximum capillary length and diaphragm size chart

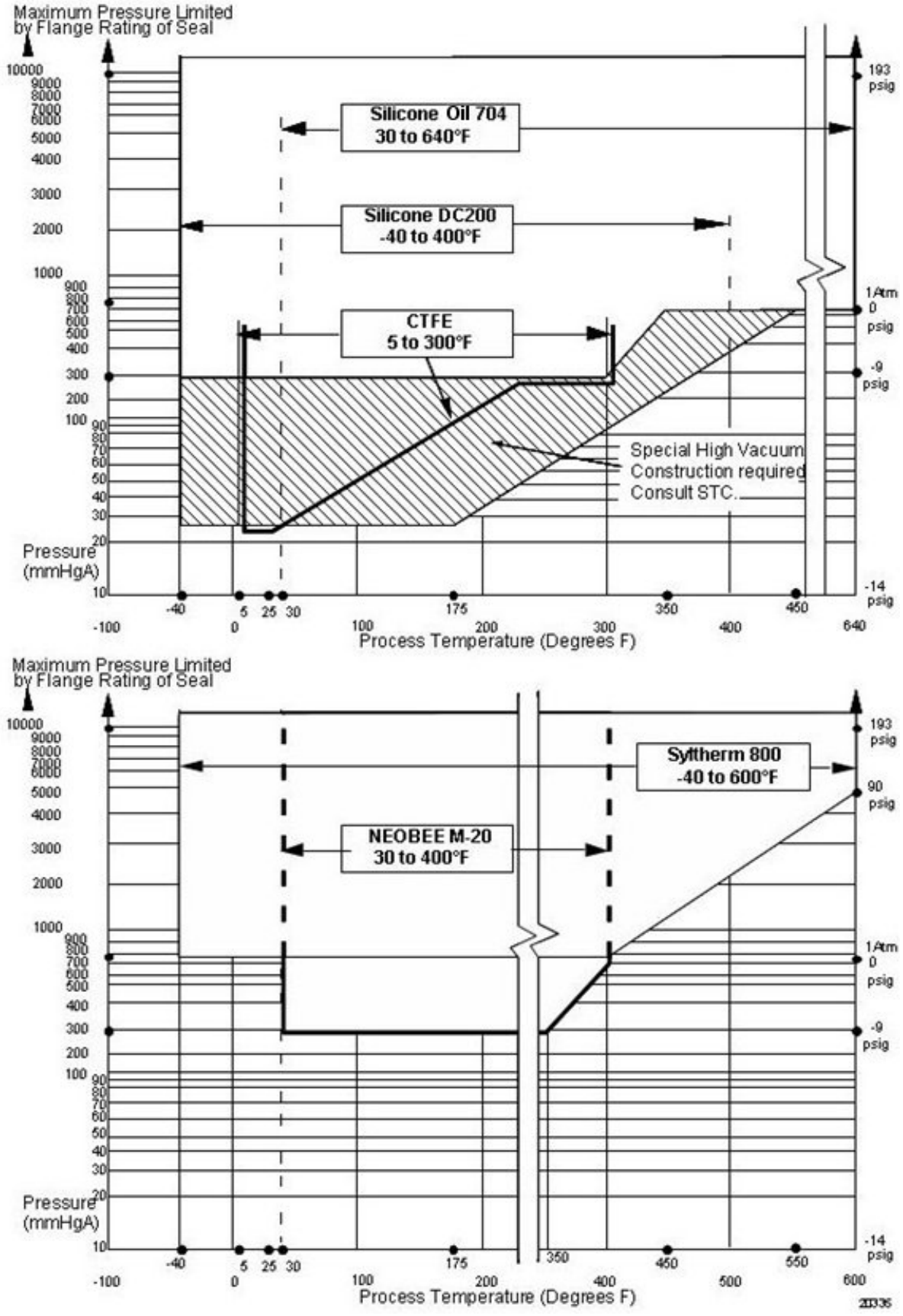


Figure 15—ST 3000 Remote Seals operable limits for pressure vs. temperature

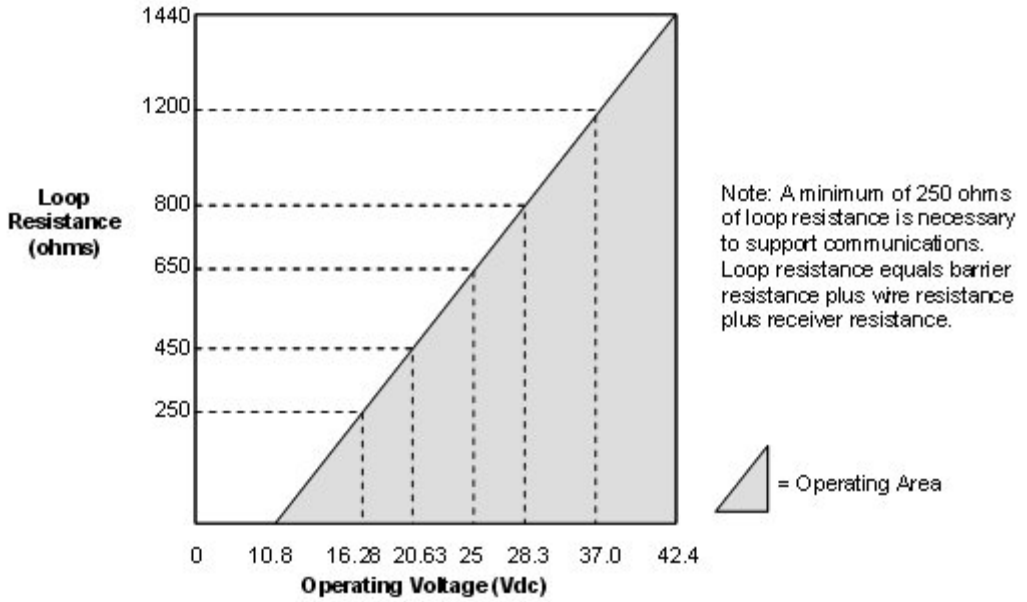
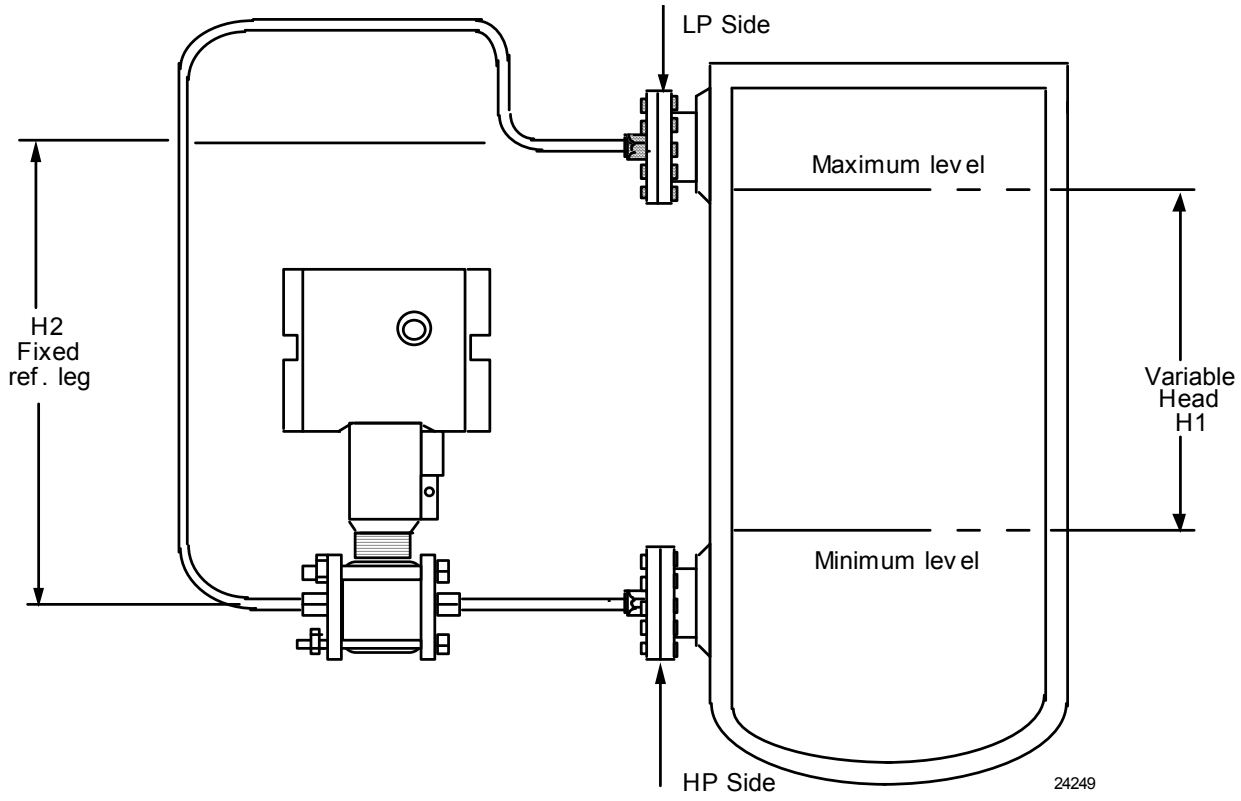


Figure 16—Supply voltage/loop resistance chart



NOTE: Lower flange seal should not be mounted over 22 feet below or above 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 STR13D.

Figure 17—The ST 3000 transmitter with remote diaphragm seals shown mounted on a tank

Application Data

Liquid Level: Closed Tank

Determine the minimum and maximum pressure differentials to be measured (Figure 18).

PMin = (SGp x a) - (SGf x d)
= LRV when HP at bottom of tank
= –URV when LP at bottom of tank

PMax = (SGp x b) - (SGf x d)
= URV when HP at bottom of tank
= –LRV when LP at bottom of tank

Where:

minimum level at 4mA
maximum level at 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 11 for values.)

SG_p = Specific Gravity of process fluid

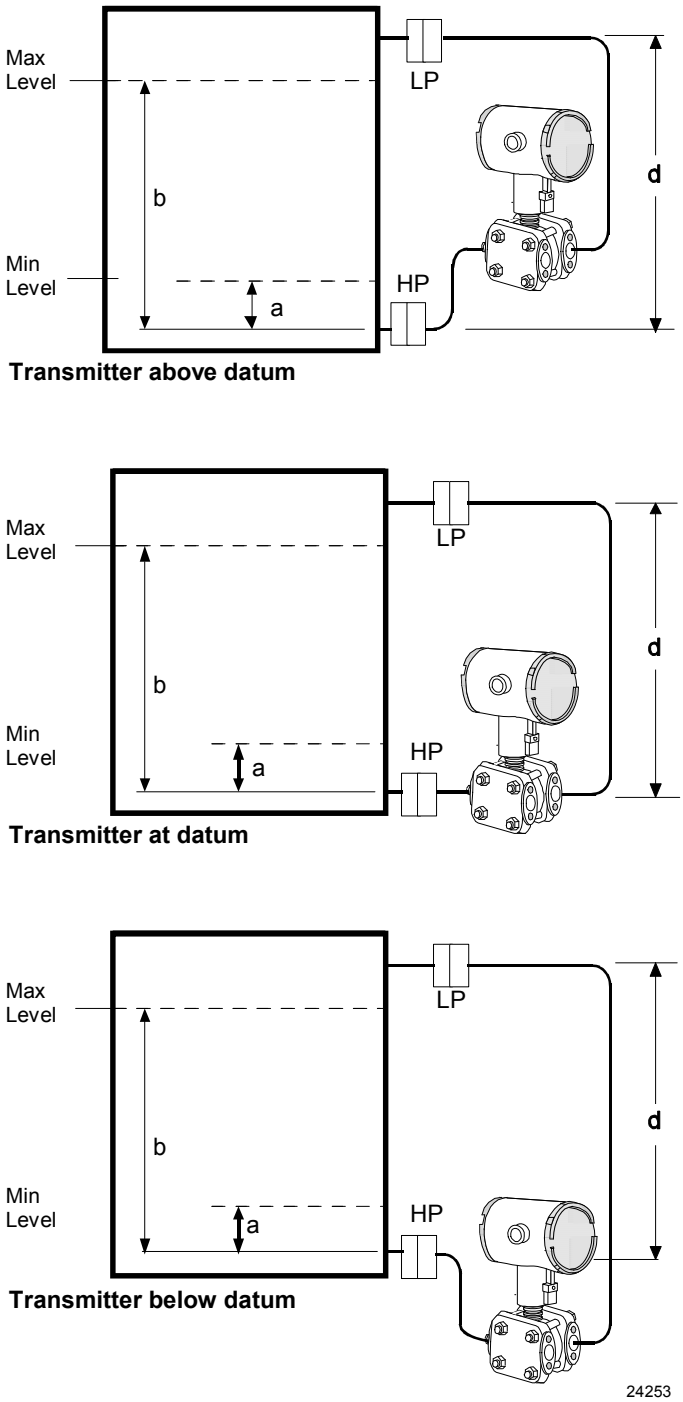


Figure 18—Closed tank liquid level measurement distance

* Contact STC-Phoenix concerning applications for model STR13D.

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 11 for values.)

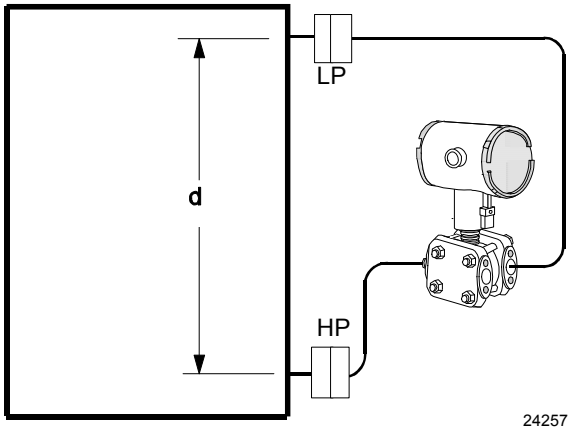


Figure 19—Density, direct acting transmitter configuration

* Contact STC-Phoenix concerning applications for model STR13D.

Reference Dimensions

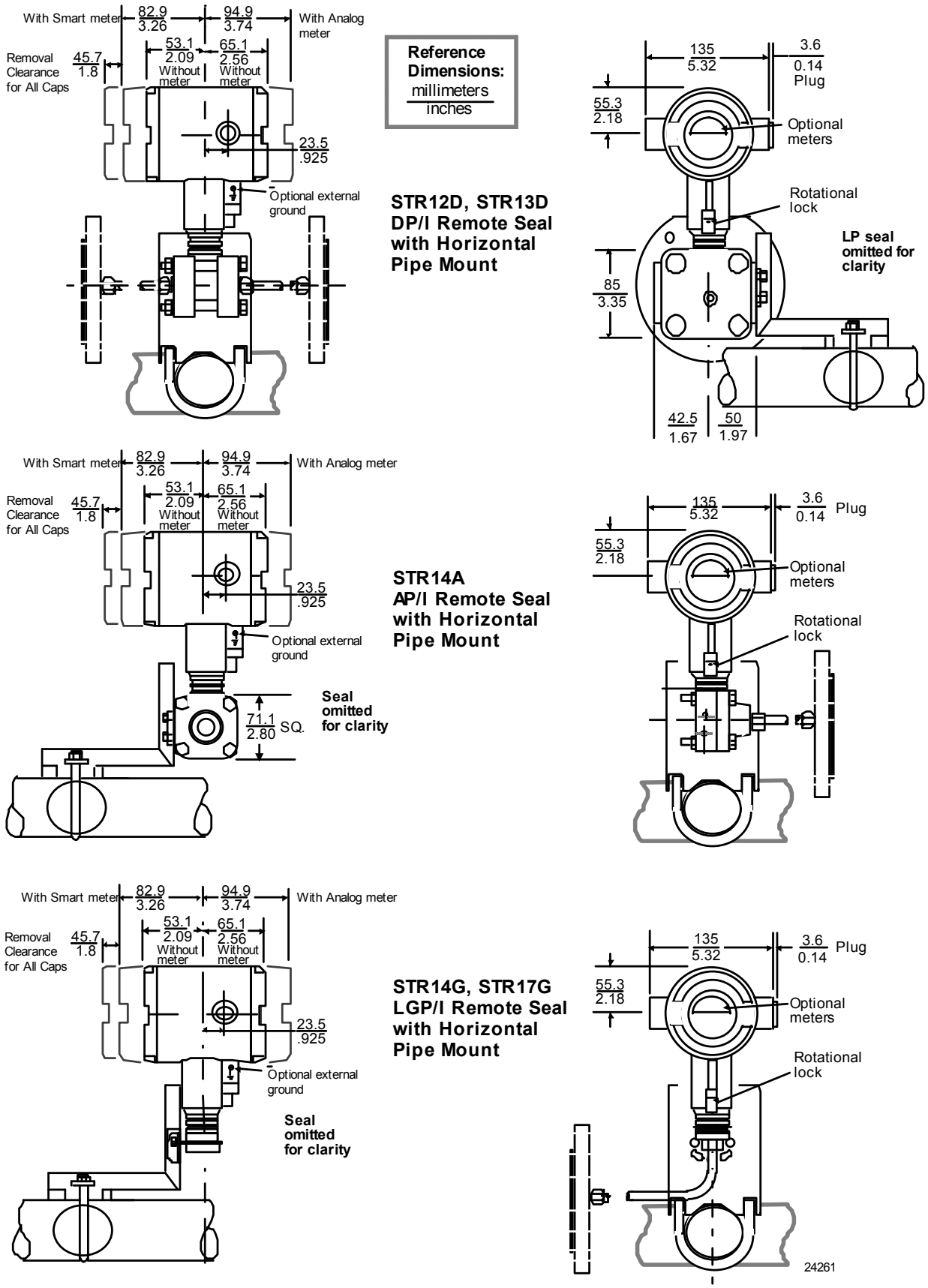


Figure 20a —Approximate horizontal mounting dimensions for Remote Seal Transmitter

Reference Dimensions

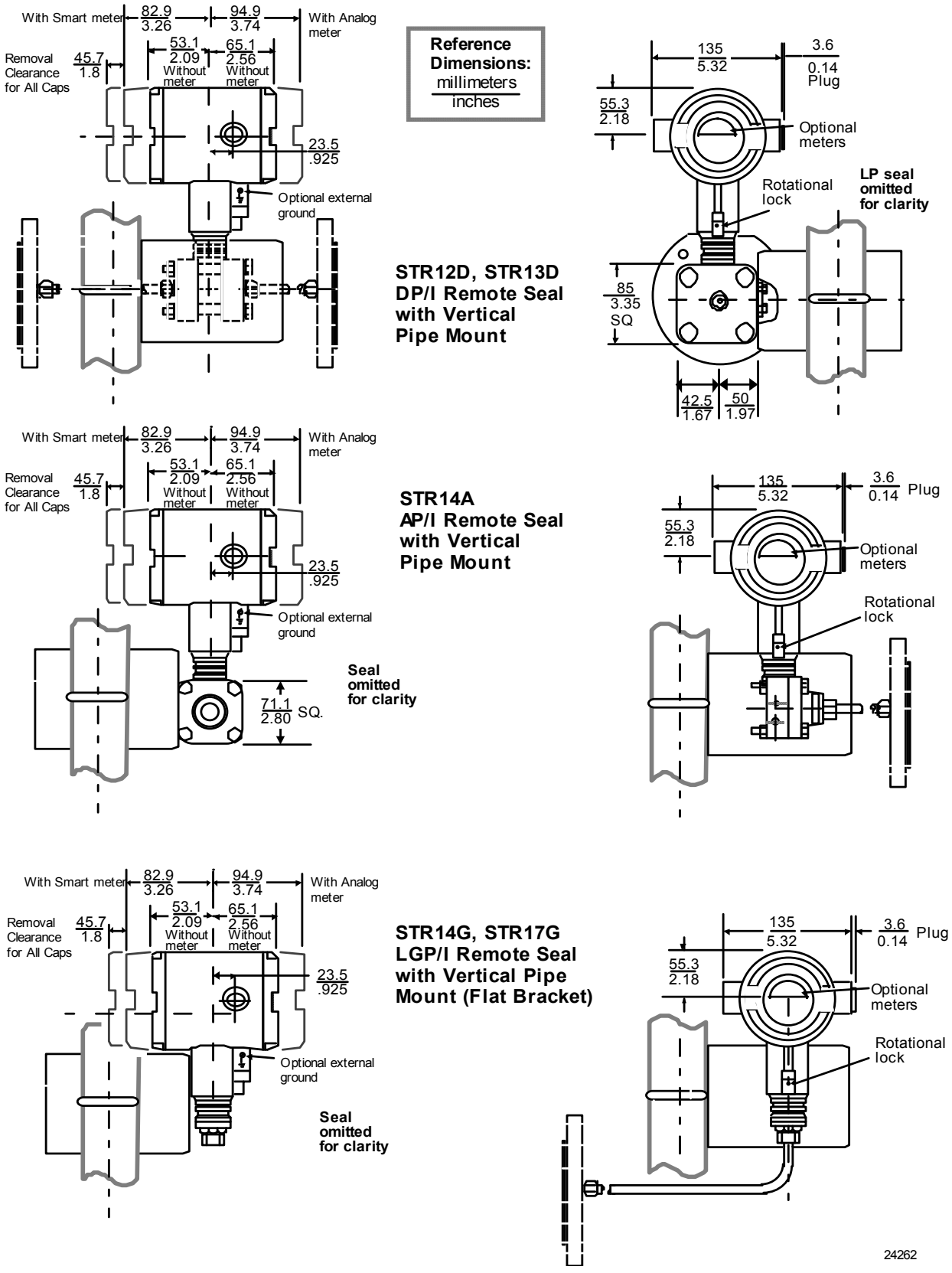


Figure 20b —Approximate vertical mounting dimensions for Remote Seal Transmitter

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		
		SS	SS	N/A	B	7.50	0.94
			Hastelloy C	SS	A		
			Hastelloy C	Hastelloy C	D		1.37
			Monel	Monel	D		
			Tantalum	SS	C		
	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		
		SS	SS	N/A	B	8.25	1.12
			Hastelloy C	SS	A		
			Hastelloy C	Hastelloy C	D		1.56
			Monel	Monel	D		
			Tantalum	SS	C		
	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		
		SS	SS	N/A	B	8.25	1.5
			Hastelloy C	SS	A		
			Hastelloy C	Hastelloy C	D		1.75
			Monel	Monel	D		
			Tantalum	SS	C		
	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		
		SS	SS	N/A	B	7.87	0.94
			Hastelloy C	SS	A		
			Hastelloy C	Hastelloy C	D		1.32
			Monel	Monel	D		
			Tantalum	SS	C		

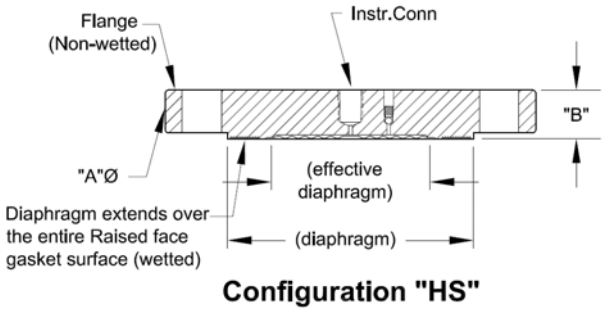


Figure “A”

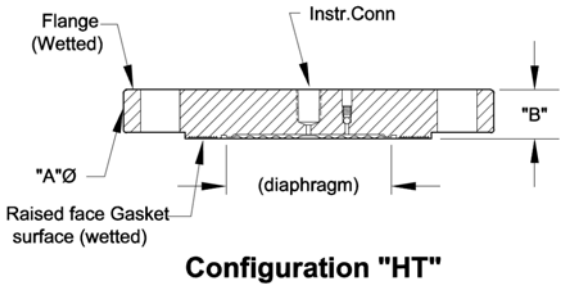


Figure “B”

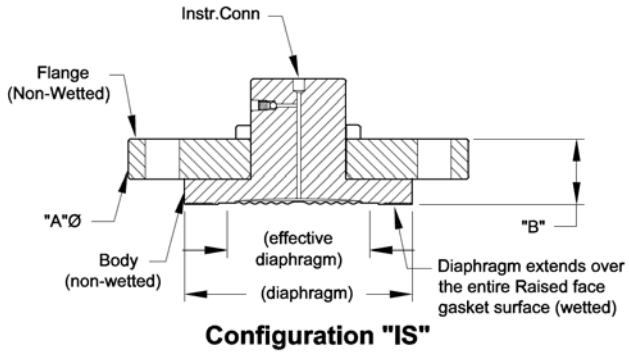


Figure “C”

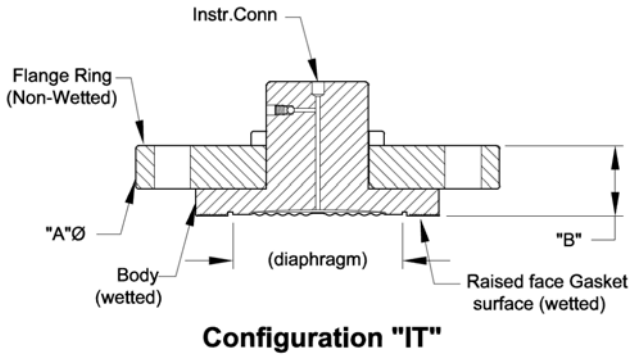


Figure “D”

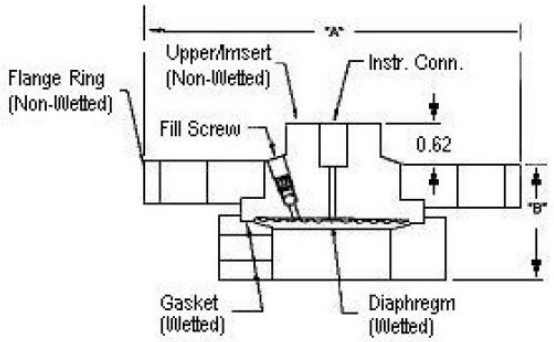
Dimensions and Drawings

Flush Flanged Seal with Lower

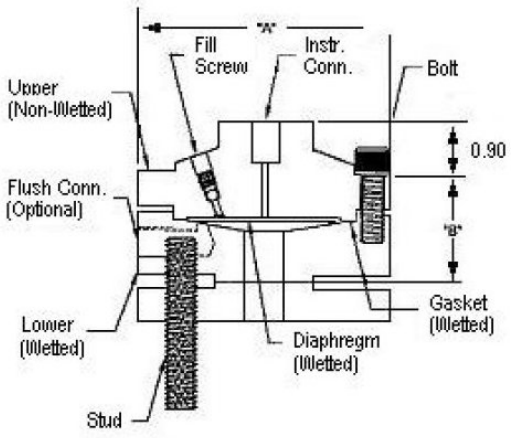
Type	ANSI/DIN Rating	Size	Dimension	2.4" Diaph. Dia. (in.)	2.9" Diaph. Dia. (in.)	4.1" Diaph. Dia. (in.)
Flush Flanged Seal with Lower	Class 150#	1/2"	A	3.50	4.00	5.25
			B0	1.72	1.72	1.84
			B1	1.72	1.72	1.84
			B2	2.22	2.22	2.34
		1"	B0	4.25	4.00	5.25
				1.12	1.72	1.84
				1.62	1.72	1.84
			B2	1.98	1.72	2.34
		1-1/2"		5.00	5.00	5.25
			B0	2.50	2.50	1.78
			B1	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	2.60
			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

Dimensions and Drawings



Flush Flanged Seal with Lower



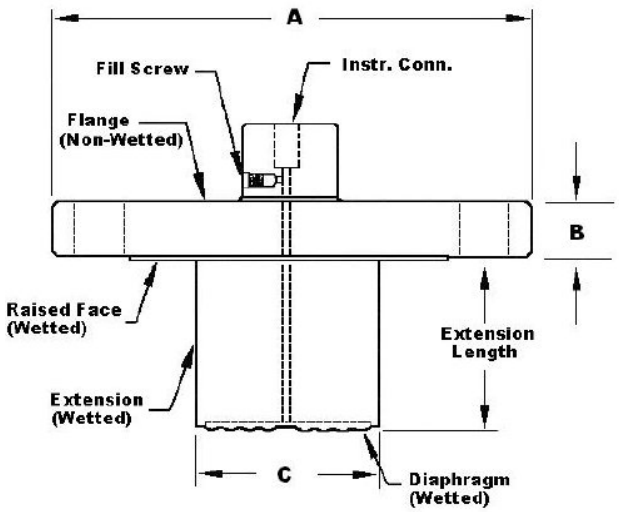
Flush Flanged Seal with Lower

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

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

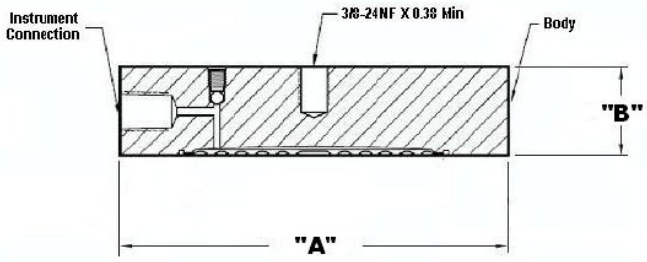
Designed to meet with schedule 40 pipe



Flange Extended Seal

Pancake Seal

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

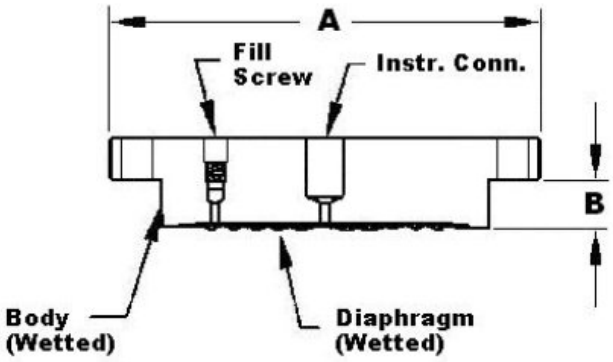


Pancake Flange Seal

Dimensions and Drawings

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

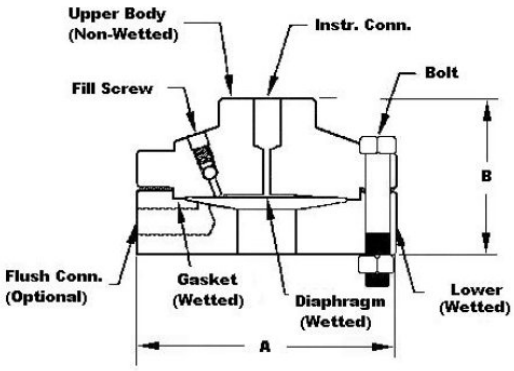


Chemical Tee "Taylor Wedge" Seal

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	1.66	1.66	1.79
		B1	1.66	1.66	1.79
		B2	2.18	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	8.25	2.16	2.14

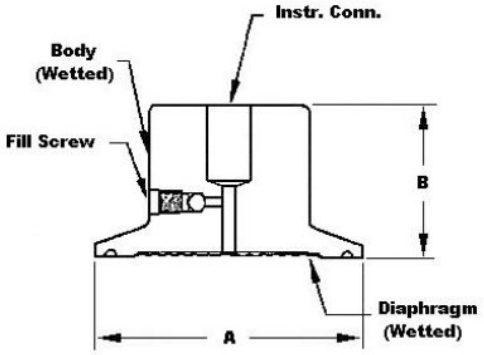
B0 Without Flush
B1 B Dimension with 1/4 NPT Flushing Connection
B2 B dimension with 1/2 NPT Flushing Connection



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.)
Sanitery 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

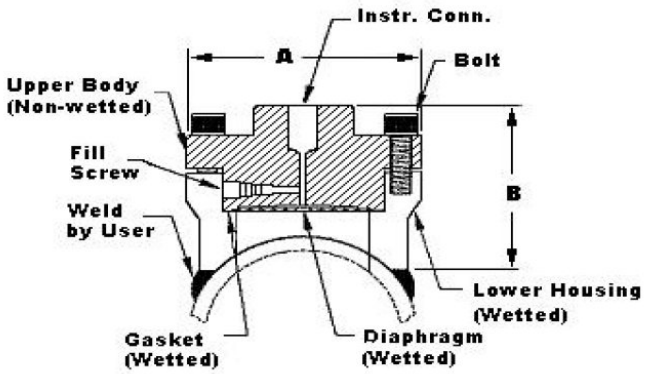


Sanitary Seal

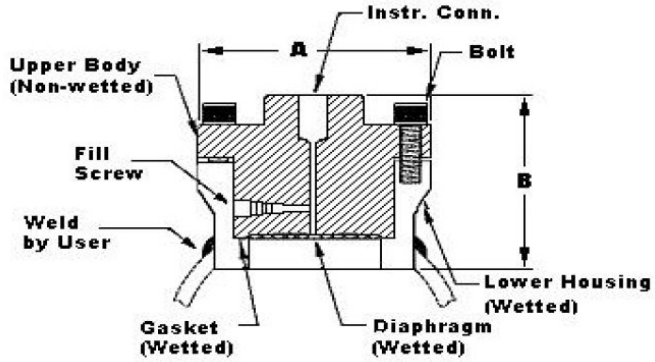
Saddle Seal

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



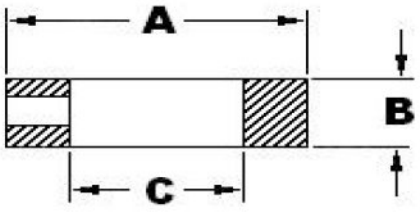
3" Saddle Seal



4" Saddle Seal

Calibration Ring

Type	Size	Rating	Dimension	1/4 NPT	1/2 NPT
Calibration Ring	3"	150# / 600#	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 ±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® Output Protocol (Options HC and H6)**

Optional electronic modules for the ST 3000 provide HART® Protocol compatibility in either HART® 5.x or 6.x formats. Transmitters with a HART® Option are compatible with any HART® enabled system that provides 5.x or 6.x format support.

- **Foundation™ 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 the 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 ≤ 3.6 mA and ≥ 21.0 mA.

The normal ST 3000 ranges are ≤ 3.8 mA and ≥ 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® 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.

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

ST 3000 Smart Transmitter (DP, GP & AP) Remote Seals Series 100

Model Selection Guide

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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
_ _ _ _ _ _	-	_ _ _	-	_ _ _ _ _ _ _ _ _ _ _ _	-	_ _ , _ _	+	X X X X

KEY NUMBER

Description	Selection	Availability		
0-4" to 0-400" H_2O / 0-10 to 0-1,000 mbar Body Rating*: 2,500 psi (172 bar) - Compound Characterized	STR12D	↓		
0-1 to 0-100 psi / 0-0.07 to 0-7 bar Body Rating*: 2,500 psi (172 bar)	STR13D	↓		
0-5 to 0-500 psia / 0-0.34 to 0-35 bar A Body Rating*: 500 psia (35 bar A)	STR14A		↓	
0-5 to 0-500 psi / 0-0.34 bar to 0-35 bar Body Rating*: 500 psi (35 bar)	STR14G			↓
0-30 to 0-3,000 psi / 0-2.1 bar to 210 bar Body Rating*: 3,000 psi (210 bar)	STR17G			↓

*** 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		Selection			
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**	**8**
Fill Fluid (Meter body)	DC®200 Silicone	_ 1 _	●	●	●
	CTFE	_ 2 _	**q**	**q**	**q**
Construction	**Non-Wetted Adapter Head Material**				
In-Line Gauge	316 SS Bonnet	_ _ A			●
	316 SS Bonnet for Close-Couple	_ _ D			**y**
Dual Head DP	316 SS (bolt-on heads)	_ _ A	●		
	316 SS for Close-Couple	_ _ D	**y**		
	316 SS with all-welded meter body	_ _ C	**7**		
Single Head Absolute	316 SS Adapter Head	_ _ A		●	
	316 SS Head for Close-Couple	_ _ D		**y**	

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TABLE II - SEALS

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.

					Selection	12D & 13D	14A	14G & 17G
Secondary Fill	No Fill Fluid				0 _ _ _ _ _ _ _ _ _ _ _	3	3	3
	Silicone (DC®200)				1 _ _ _ _ _ _ _ _ _ _ _	•	•	•
	CTFE				2 _ _ _ _ _ _ _ _ _ _ _	•	•	•
	Silicone (DC®704)				3 _ _ _ _ _ _ _ _ _ _ _	•	•	•
	Neobee® (M20) [2]				4 _ _ _ _ _ _ _ _ _ _ _	•	•	•
	Syltherm® 800 [3]				5 _ _ _ _ _ _ _ _ _ _ _	•	•	•
Connection of Remote Seal to Meter Body	No Capillary, No Nipple				_ 0 _ _ _ _ _ _ _ _ _ _	3	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	z
No Selection					_ _ 0 _ _ _ _ _ _ _ _ _	•	•	•
No Seal Attached to Core Transmitter					_ _ _ 0 0 0 0 0 0 0 0 0	3	3	3
Flush Flanged Seal	**Diaphragm Diameter**	**Flange Size**	**Flange Pressure Rating [1]**		**Selection**			
	3.5"	3"	ANSI Class 150		_ _ _ AFA _ _ _ _ _ _	•	•	•
			ANSI Class 300		_ _ _ AFC _ _ _ _ _ _	•	•	•
		80mm	DIN DN80-PN40		_ _ _ AFM _ _ _ _ _ _	•	•	•
	Wetted Material		**Diaphragm**	**Upper Insert**	**Selection**			
			316L SS	316L SS	_ _ _ _ _ _ AA _ _ _ _	•	•	•
			Hastelloy® C-276	316L SS	_ _ _ _ _ _ AB _ _ _ _	•	•	•
			Hastelloy® C-276	Hastelloy® C-276	_ _ _ _ _ _ AC _ _ _ _	•	•	•
			Monel 400®	Monel 400®	_ _ _ _ _ _ AE _ _ _ _	•	•	•
			Tantalum [5]	316L SS	_ _ _ _ _ _ AF _ _ _ _	1	1	1
	Non-Wetted Material (upper)		CS (Nickel Plated)		_ _ _ _ _ _ _ _ 1 _ _ _	•	•	•
			316L SS		_ _ _ _ _ _ _ _ 2 _ _ _	•	•	•
	Seal-Capillary Connection		Center Seal		_ _ _ _ _ _ _ _ _ 1 _ _	•	•	•
			Side Seal		_ _ _ _ _ _ _ _ _ 2 _ _	9	9	9
	Calibration Rings		None		_ _ _ _ _ _ _ _ _ _ A _	•	•	•
			316L SS		_ _ _ _ _ _ _ _ _ _ B _	5	5	5
			Hastelloy® C-276		_ _ _ _ _ _ _ _ _ _ C _	5	5	5
			Monel 400®		_ _ _ _ _ _ _ _ _ _ D _	5	5	5

Table II continued next page

[1] Standard facing 125-250 AARH RF (raised face) serrated surface finish.
[2] Limited vacuum availability.
[3] Minimum static pressure requirement. No vacuum allowed. See Specifications Figure 15.
[5] 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.

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TABLE II - SEALS (continued)

			Selection	STR12D & 13D	STR14A	14G & 17G
Flush Flanged Seal	Flushing Connections and Plugs[4] (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	6
		One 1/4" with metal plug	_ _ _ _ _ _ _ _ _ _ _ J	6	6	6
		Two 1/4" with plastic plugs	_ _ _ _ _ _ _ _ _ _ _ M	6	6	6
		Two 1/4" with metal plugs	_ _ _ _ _ _ _ _ _ _ _ N	6	6	6
		One 1/2" with plastic plug	_ _ _ _ _ _ _ _ _ _ _ P	6	6	6
		One 1/2" with metal plug	_ _ _ _ _ _ _ _ _ _ _ Q	6	6	6
		Two 1/2" with plastic plugs	_ _ _ _ _ _ _ _ _ _ _ R	6	6	6
		Two 1/2" with metal plugs	_ _ _ _ _ _ _ _ _ _ _ S	6	6	6

Table II continued below

TABLE II - SEALS (continued)

	Diaphragm Diameter	Flange Size	Flange Pressure Rating [1]	Const. - See Spec. Figure 34-ST-03-64	Construction - See Spec. Figure 34-ST-03-64 Selection	STR12D & 13D	STR14A	14G & 17G
Flush Flanged Seal with Lower	2.4"	1"	ANSI 150	22	_ _ _ BCA _ _ _ _ _ _	t	4	●
			ANSI 300	22	_ _ _ BCC _ _ _ _ _ _	t	4	●
		1-1/2"	ANSI 150	22	_ _ _ BGA _ _ _ _ _ _	t	4	●
			ANSI 300	22	_ _ _ BGC _ _ _ _ _ _	t	4	●
		2"	ANSI 150	22	_ _ _ BDA _ _ _ _ _ _	t	4	●
			ANSI 300	22	_ _ _ BDC _ _ _ _ _ _	t	4	●
		3"	ANSI 150	22	_ _ _ BFA _ _ _ _ _ _	t	4	●
			ANSI 300	22	_ _ _ BFC _ _ _ _ _ _	t	4	●
	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	22	_ _ _ 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

[1] Standard facing 125-250 AARH RF (raised face) serrated surface finish.
[4] 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)

					STR12D & 13D	STR14A 14G & 17G		
Flush Flanged Seal with Lower	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	1	
		Tantalum	Hastelloy® C-276	_ _ _ _ _ _ BG _ _ _ _	1	1	1	
		Tantalum	Tantalum Clad	_ _ _ _ _ _ BH _ _ _ _	10	10	10	
	Non-Wetted Material (upper, upper insert)	**Upper**	**Upper Insert**	**Selection**				
		316L SS	316L SS	_ _ _ _ _ _ _ _ 4 _ _ _	•	•	•	
		Carbon Steel	316L SS	_ _ _ _ _ _ _ _ 5 _ _ _	•	•	•	
	Bolts [6]	No Selection		_ _ _ _ _ _ _ _ 0 _ _	•	•	•	
	Flushing Connections and Plugs[4] (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 _	•	•	•	
		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	c	
		Grafoil®		_ _ _ _ _ _ _ _ _ _ G	•	•	•	
		Teflon®		_ _ _ _ _ _ _ _ _ _ T	c	c	c	
		Gylon® 3510		_ _ _ _ _ _ _ _ _ _ L	d	d	d	

Table II continued below

TABLE II - SEALS (continued)

						STR12D & 13D	STR14A 14G & 17G		
	Diaphragm Diameter	**Flange Size**	**Flange Pressure Rating [1]**		**Selection**				
Flange Seal with Extended Diaphragm	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 _ _ _ _	•	•	•	
	Non-Wetted Material (flange)		CS (Nickel Plated)		_ _ _ _ _ _ _ _ 7 _ _ _	•	•	•	
			316L SS		_ _ _ _ _ _ _ _ 8 _ _ _	•	•	•	
	Bolts		No Selection		_ _ _ _ _ _ _ _ 0 _ _	•	•	•	
	Extension Length		2"		_ _ _ _ _ _ _ _ _ _ 2 _	•	•	•	
			4"		_ _ _ _ _ _ _ _ _ _ 4 _	•	•	•	
			6"		_ _ _ _ _ _ _ _ _ _ 6 _	•	•	•	
No Selection	No Selection		No Selection		_ _ _ _ _ _ _ _ _ _ 0	•	•	•	

Table II continued next page

[1] Standard facing 125-250 AARH RF (raised face) serrated surface finish.
[4] Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation
[6] 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.

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TABLE II - SEALS (continued)

	Diaphragm Diameter	Flange Size	Flange Pressure Rating Dependent on Customer Flange [1]		Selection	STR12D & 13D	STR14A 14G & 17G	
Pancake Seal	3.5"	3"	ANSI Class 150/300/600		_ _ _ GFA _ _ _ _ _ _	●	●	●
	Wetted Material		**Diaphragm**	**Body**				
			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 [7]	_ _ _ _ _ _ GG _ _ _ _	1	1	1
	Non-Wetted Material		No Selection		_ _ _ _ _ _ _ _ 0 _ _ _	●	●	●
	Bolts		No Selection		_ _ _ _ _ _ _ _ _ 0 _ _	●	●	●
	Calibration Rings		None		_ _ _ _ _ _ _ _ _ _ A _	●	●	●
			316L SS		_ _ _ _ _ _ _ _ _ _ B _	5	5	5
			Hastelloy® C-276		_ _ _ _ _ _ _ _ _ _ C _	5	5	5
			Monel 400®		_ _ _ _ _ _ _ _ _ _ D _	5	5	5
	Flushing Connections and Plugs[4] (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	6
			One 1/4" with metal plug		_ _ _ _ _ _ _ _ _ _ _ J	6	6	6
			Two 1/4" with plastic plugs		_ _ _ _ _ _ _ _ _ _ _ M	6	6	6
			Two 1/4" with metal plugs		_ _ _ _ _ _ _ _ _ _ _ N	6	6	6
			One 1/2" with plastic plug		_ _ _ _ _ _ _ _ _ _ _ P	6	6	6
			One 1/2" with metal plug		_ _ _ _ _ _ _ _ _ _ _ Q	6	6	6
			Two 1/2" with plastic plugs		_ _ _ _ _ _ _ _ _ _ _ R	6	6	6
			Two 1/2" with metal plugs		_ _ _ _ _ _ _ _ _ _ _ S	6	6	6

Table II continued below

TABLE II - SEALS (continued)

	Diaphragm Diameter	Flange Size	Flange Pressure Rating [1]		Selection	STR12D & 13D	STR14A 14G & 17G	
Chemical Tee "Taylor" Wedge	3.5"	Taylor Wedge 5" O.D.	750 psi		_ _ _ HM0 _ _ _ _ _ _	v		
	Wetted Material		**Diaphragm**	**Body**	**Selection**			
			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

[1] Standard facing 125-250 AARH RF (raised face) serrated surface finish.
[4] Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation
[7] 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)	Pressure Rating CS Bolts	Pressure Rating 304 SS Bolts	STR12D & 13D Selection	STR14A 14G & 17G		
Seal with Threaded Process Connection	2.4"	1/2 NPT	2,500 psi	1,250 psi	_ _ _ JJG _ _ _ _ _ _	t	4	●
		3/4 NPT			_ _ _ JKG _ _ _ _ _ _	t	4	●
		1 NPT			_ _ _ JLG _ _ _ _ _ _	t	4	●
	2.9"	1/2 NPT	2,500 psi	1,250 psi	_ _ _ KJG _ _ _ _ _ _	●	●	●
		3/4 NPT			_ _ _ KKG _ _ _ _ _ _	●	●	●
		1 NPT			_ _ _ KLG _ _ _ _ _ _	●	●	●
	4.1"	1/2 NPT	1,500 psi	750 psi	_ _ _ LJG _ _ _ _ _ _	●	●	●
		3/4 NPT			_ _ _ LKG _ _ _ _ _ _	●	●	●
		1 NPT			_ _ _ LLG _ _ _ _ _ _	●	●	●

		Diaphragm	Lower	Selection			
Seal with Threaded Process Connection	Wetted Material	316L SS	Carbon Steel	_ _ _ _ _ _ JA _ _ _ _	●	●	●
		316L SS	316L SS	_ _ _ _ _ _ JB _ _ _ _	●	●	●
		Hastelloy® C-276	316L SS	_ _ _ _ _ _ JC _ _ _ _	●	●	●
		Hastelloy® C-276	Hastelloy® C-276	_ _ _ _ _ _ JD _ _ _ _	●	●	●
		Monel 400®	Monel 400®	_ _ _ _ _ _ JE _ _ _ _	●	●	●
		Tantalum	316L SS	_ _ _ _ _ _ JF _ _ _ _	1	1	1
		Tantalum	Hastelloy® C-276	_ _ _ _ _ _ JG _ _ _ _	1	1	1
	Non-Wetted Material (upper)	CS (Nickel Plated)		_ _ _ _ _ _ _ _ A _ _ _	●	●	●
		Stainless Steel		_ _ _ _ _ _ _ _ C _ _ _	w	w	w
	Bolts [8]	Carbon Steel		_ _ _ _ _ _ _ _ _ C _ _	1	1	1
		304 SS		_ _ _ _ _ _ _ _ _ D _ _	●	●	●
	Flushing Connections and Plugs[4] (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 _	11	11	11
		One 1/2" with metal plug		_ _ _ _ _ _ _ _ _ _ Q _	11	11	11
		Two 1/2" with plastic plugs		_ _ _ _ _ _ _ _ _ _ R _	11	11	11
		Two 1/2" with metal plugs		_ _ _ _ _ _ _ _ _ _ S _	11	11	11
	Gasket	Klinger® C-4401 (non-asbestos)		_ _ _ _ _ _ _ _ _ _ K	c	c	c
		Grafoil®		_ _ _ _ _ _ _ _ _ _ G	●	●	●
		Teflon®		_ _ _ _ _ _ _ _ _ _ T	c	c	c
		Gylon® 3510		_ _ _ _ _ _ _ _ _ _ L	d	d	d

Table II continued next page

[4] Plastic Plugs are TEMPORARY ONLY to protect threads and MUST be REMOVED before installation

[8] 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.

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TABLE II - SEALS (continued)

	Diaphragm Diameter	Flange Size	Pressure Rating		Selection	STR12D & 13D	STR14A	STR14A 14G & 17G
Sanitary Seal [9]	1.9"	2"	Customer clamp rating or 600 psi, whichever is less		_ _ _ MD0 _ _ _ _ _ _			24
	2.4"	2-1/2"			_ _ _ NE0 _ _ _ _ _ _	25		24
	2.9"	3"			_ _ _ PF0 _ _ _ _ _ _	24	24	24
	4.1"	4"			_ _ _ QG0 _ _ _ _ _ _	24	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®		_ _ _ _ _ _ _ _ _ 8 _	●	●	●
	Gasket		No Selection		_ _ _ _ _ _ _ _ _ _ 0	●	●	●
Saddle Seal	Diaphragm Diameter	Size and Bolt Pattern	Seal Pressure Rating C.S. Bolts	Seal Pressure Rating 304 SS Bolts	Selection			
	2.4" **8-Bolt** Design	for 3" Pipe ≥ 4" pipe	1,500 psi	1,500 psi	_ _ _ RFK _ _ _ _ _ _	t	4	●
					_ _ _ RGK _ _ _ _ _ _	t	4	●
	2.4" **6-Bolt** Design	for 3" Pipe ≥ 4" pipe	1,250 psi	1,250 psi	_ _ _ RPK _ _ _ _ _ _	t	4	●
					_ _ _ RQK _ _ _ _ _ _	t	4	●
	Wetted Material		Diaphragm	Lower Housing	Selection			
			316L SS	Carbon Steel	_ _ _ _ _ _ RA _ _ _ _	●	●	●
			316L SS	316L SS	_ _ _ _ _ _ RB _ _ _ _	●	●	●
			Hastelloy® C-276	316L SS	_ _ _ _ _ _ RC _ _ _ _	●	●	●
			Hastelloy® C-276	Hastelloy® C-276	_ _ _ _ _ _ RD _ _ _ _	●	●	●
			316L SS	N/A-Body Only [10]	_ _ _ _ _ _ SB _ _ _ _	●	●	●
			Hastelloy® C-276	N/A-Body Only [10]	_ _ _ _ _ _ SC _ _ _ _	●	●	●
	Non-Wetted Material		Body	Bolts [8, 10]	Selection			
			Carbon Steel	Carbon Steel	_ _ _ _ _ _ _ B _ _ _	1	1	1
			316L SS	304 SS	_ _ _ _ _ _ _ C _ _ _	●	●	●
	Bolts		No Selection		_ _ _ _ _ _ _ _ 0 _ _	●	●	●
	Styles		No Selection		_ _ _ _ _ _ _ _ _ 0 _	●	●	●
	Gasket		Klinger® C-4401 (non-asbestos)		_ _ _ _ _ _ _ _ _ _ K	●	●	●
			Grafoil®		_ _ _ _ _ _ _ _ _ _ G	●	●	●
			Teflon®		_ _ _ _ _ _ _ _ _ _ T	●	●	●
			Gylon® 3510		_ _ _ _ _ _ _ _ _ _ L	●	●	●

[8] If Table III Bolt/Nut option is chosen, Seal bolts will ship as same material, and MAWP may change.
[9] All sanitary seals have dairy grade 3A approval.
[10] 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	Selection	STR12D & 13D	STR14A	14G & 17G	
Communication Options *(Must choose a communications option)*					
Analog only *(can be configured using appropriate Honeywell DE tool)*	AN	●	●	●	
DE Protocol communications	DE	●	●	●	
HART® 5.x Protocol compatible electronics	HC	●	●	●	b
HART® 6.x Protocol compatible electronics	H6	●	●	●	
FOUNDATION™ Fieldbus Communications	FF	r	r	r	
Indicating Meter Options					
Analog Meter *(0-100 Even 0-10 Square Root)*	ME	●	●	●	
Smart Meter	SM	●	●	●	b
Custom Configuration of Smart Meter	CI	f	f	f	
Local Zero & Span	ZS	m		m	
Local Zero	LZ	x		x	b
Transmitter Housing & Electronics Options					
*No housing conduit plugs or adaptors come standard with the ST 3000. For certain approval codes, you **must** select a certified conduit plug from below and it will come packaged in the box with your transmitter.*					
316 SS[5] Electronics Housing *- (with M20 Conduit Connections)*	SH	n	n	n	
316 SS[5] Electronics Housing - *(with M20 to 1/2 NPT 316 SS Conduit Adapter for use with FM and CSA Approval codes)*	A3	i	i	i	b
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	15	
SIL 2 - TÜV Certified transmitter *(requires HC or H6 and WP options)*	SL	14	14	14	
Lightning Protection	LP	●	●	●	
Custom Calibration and I.D. in Memory	CC	●	●	●	
Transmitter Configuration - *(non-Fieldbus)*	TC	15	15	15	
Transmitter Configuration - *(Fieldbus)*	FC	21	21	21	
Write Protection *(Delivered in the "enabled" position)*	WP	●	●	●	
Write Protection *(Delivered in the "disabled" position)*	WX	●	●	●	b
Stainless Steel Customer Wired-On Tag *(4 lines, 26 characters per line, customer supplied information)*	TG	●	●	●	b
Stainless Steel Customer Wired-On Tag *(blank)*	TB	●	●	●	
Meter Body Options (Seal bolt material depends on Transmitter bolt material)					
A286 SS *(NACE)* Bolts and 304 SS *(NACE)* Nuts for Heads	CR	●	●		
316 SS Bolts and 316 SS Nuts for Process Heads	SS	●			b
B7M Bolts and Nuts for Process Heads	B7	●			
Remote Seal Options					
Gold Plated Seal Diaphragm *(1 Seal)*	G1	j	j	j	
Gold Plated Seal Diaphragm *(2 Seals)*	G2	j			
Teflon Coated Seal Diaphragm *(1 Seal) - only for anti-sticking*	N1	j	j	j	b
Teflon Coated Seal Diaphragms *(2 Seals) - only for anti-sticking*	N2	j			
Transmitter Mounting Bracket Options					
Angle Mounting Bracket - Carbon Steel	MB	●	●	●	
Marine Approved Angle Mounting Bracket - Carbon Steel	MX	●	●	●	
Angle Mounting Bracket - 304 SS	SB	●	●	●	b
Marine Approved Angle Mounting Bracket - 304 SS	SX	●	●	●	
Flat Mounting Bracket - Carbon Steel	FB	●	●	●	
Services/Certificates/Marine Type Approvals Options					
Users Manual Paper Copy *(Standard, HC/H6 or FF ships accordingly)*	UM	●	●	●	
Clean Transmitter for Oxygen or Chlorine Service with Certificate (50039190)	0X	h	h	h	
Over-Pressure Leak Test with Certificate (F3392)	TP	●	●	●	
Calibration Test Report and Certificate of Conformance (F3399)	F1	●	●	●	
Certificate of Conformance (F3391)	F3	●	●	●	b
Certificate of Origin (F0195)	F5	●	●	●	
SIL Certificate *(SIL 2/3)* (FC33337)	FE	22	22	22	
NACE Certificate *(Process-Wetted & Non-Process Wetted)* (FC33339)	F7	o	o	●	
NACE Certificate for all welded meter bodies only (F0198)	F8	16			b
NACE Certificate *(Process-Wetted only)* (FC33338)	FG	●	●	●	
Material Traceability Certification per EN 10204 3.1 (FC33341)	FX	●	●	●	
Marine Type Approvals *(DNV, ABS, BV, KR & LR)*	MT	2	2	2	

[5] Supplied as 316 SS or as Grade CF8M, the casting equivalent of 316 SS.

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TABLE III - OPTIONS (continued)

Warranty Options		STR12D & 13D	STR14A 14G	STR14A 17G	
Additional Warranty - 1 year	W1	•	•	•	
Additional Warranty - 2 years	W2	•	•	•	
Additional Warranty - 3 years	W3	•	•	•	b
Additional Warranty - 4 years	W4	•	•	•	

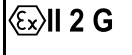
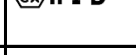
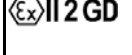
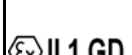
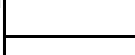
Approval Body	Approval Type	Location or Classification	Selection				
No hazardous location approvals			9X	•	•	•	
ATEX [10] (LCIE)	Intrinsically Safe, Zone 0		**Ex ia IIC** T4 (Ta = –50°C to +93°C); T5 (Ta = –50°C to +85°C); T6 (Ta = –50°C to +70°C) Enclosure IP 66/67	3S	•	•	•	
	Intrinsically Safe, Zone 1		**Ex ia IIC** 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		**Ex tD A20 IP6X** T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C) Enclosure IP 66/67	33	**26**	**26**	**26**	
	Flameproof and Dust-tight Enclosure, Zone 1		**Ex d IIC** T5 (Ta = –40°C to +93°C), T6 (Ta = –40°C to +78°C) Supply 11- 42Vdc **Ex tD A21 IP6X** T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C) Enclosure IP 66/67					
	Non-Sparking, Zone 2		**Ex nA, IIC** T5 (Ta = –40°C to +93°C), T6 (Ta = –40°C to +78°C); Zone 2 Supply < 42Vdc, 23mA **Ex tD A22 IP6X** T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C) (Honeywell). Enclosure IP 66/67	3N				b
	Multiple Marking [11] Int. Safe, Zone 0/1 and Dust-tight Enclosure, or Flameproof, Zone 1 and and Dust-tight Enclosure, or Non-Sparking, Zone 2		**Ex ia IIC** 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 **Ex tD A20 IP6X** T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C)	3C	**26**	**26**	**26**	
			**Ex d IIC** T5 (Ta = –40°C to +93°C), T6 (Ta = –40°C to +78°C) Supply 11- 42Vdc **Ex tD A21 IP6X** T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C)					
			**Ex nA, IIC** T5 (Ta = –40°C to +93°C), T6 (Ta = –40°C to +78°C); Zone 2 Supply < 42Vdc, 23mA **Ex tD A22 IP6X** T95°C (at Ta = 93°C) or T80°C (at Ta = 78°C) (Honeywell) Enclosure IP 66/67					

Table III Approvals continued next page

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TABLE III - Approvals Options (continued)

Approval Body	Approval Type	Location or Classification	Selection	STR12D & 13D	STR14A 14G & 17G	
FM Approvals[SM]	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				
Canadian Standards Association (CSA)	Explosion Proof	Class I, Div. 1, Groups B,C,D	2J	**26**	**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	**Ex d IIC** T5 (Ta = -40 to +93ºC), T6 (Ta = -40 to +78ºC)	CA	**26**	**26**	**26**
	Intrinsically Safe, Zone 0/1	**Ex ia IIC**; T3, T4, T5 , T6 See Spec for detailed temperature codes by Communications option				
SAEx (South Africa)	Intrinsically Safe, Zone 0/1	**Ex ia IIC** T4, T5, T6	Z2	•	•	•
	Flameproof, Zone 1	**Ex d IIC** T5, T6 Enclosure IP 66/67	ZD	•	•	•
	Multiple Marking [11] Int. Safe, Zone 0/1, or Flameproof, Zone 1	**Ex ia IIC** T4, T5, T6 **Ex d IIC** T5, T6 Enclosure IP 66/67	ZA	•	•	•
CERTUSP INMETRO (Brazil)	Flameproof, Zone 1	**BR- Ex d IIC** T5, T6	6D	•	•	•
	Intrinsically Safe, Zone 0/1	**BR- Ex ia IIC**; T4, T5, T6 (See CERTUSP certificate for detailed temperature codes by Communications option)	6S	•	•	•

b

[10] See ATEX installation requirements in the ST 3000 User's Manual

[11] 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.

TABLE IV	Selection			
Factory Identification	**X X X X**	•	•	•

Ordering Example: STR12D-11A-0A0AFAAA11AH-HC,LP,2J+XXXX

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RESTRICTIONS

Restriction Letter	Available Only With		Not Available With	
	Table	Selection	Table	Selection
b	Select only one option from this group			
c			II	_ _ _ _ _ _ BF _ _ _ _, _ _ _ _ _ _ BG _ _ _ _, _ _ _ _ _ _ JF _ _ _ _, _ _ _ _ _ _ JG _ _ _ _,
d	II	_ _ _ _ _ _ BF _ _ _ _, _ _ _ _ _ _ BG _ _ _ _, _ _ _ _ _ _ BH _ _ _ _, _ _ _ _ _ _ JF _ _ _ _, _ _ _ _ _ _ JG _ _ _ _,		
f	III	SM		
h	I, II	_ 2 _ - 2 _ _ _ _ _ _ _ _ _ _ _		
i	III	1C or 2J		
j			II	_ _ _ _ _ _ AF _ _ _ _ _ _ _ _ _ _ BF _ _ _ _ _ _ _ _ _ _ BG _ _ _ _ _ _ _ _ _ _ BH _ _ _ _ _ _ _ _ _ _ GG _ _ _ _ _ _ _ _ _ _ JF _ _ _ _ _ _ _ _ _ _ JG _ _ _ _
m			III	ME, FF
n			III	1C, 2J
o	III	CR		
q	II	0 _ _ _ _ _ _ _ _ _ _ _, 2 _ _ _ _ _ _ _ _ _ _ _ 4 _ _ _ _ _ _ _ _ _ _ _		
r	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
t			I & II	2 _ _ - _ B _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ C _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ D _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ E _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ F _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ H _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ J _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ K _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ L _ _ _ _ _ _ _ _ _ _, 2 _ _ - _ M _ _ _ _ _ _ _ _ _ _

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RESTRICTIONS (continued)

Restriction Letter	Available Only With		Not Available With	
	Table	Selection	Table	Selection
v	I	2 _ _		
w			II	_ _ _ _ _ _ JA _ _ _ _
x	III	FF, SM		
y			I	2
			III	MB, SB, FB
	II	_ 2 _ _ _ _ _ _ _ _ _ _		
z	I	_ _ D		
1			III	F7
2	III	MX, SX	III	FB, MB, SB
3	I	5 _ _		
4	II	**See Figure 23 in Specification** _ A _ _ _ _ _ _ _ _ _ _, _ G _ _ _ _ _ _ _ _ _ _, _ B _ _ _ _ _ _ _ _ _ _, _ H _ _ _ _ _ _ _ _ _ _, _ 2 _ _ _ _ _ _ _ _ _ _,		
5			II	_ _ _ _ _ _ _ _ _ _ _ 0
6			II	_ _ _ _ _ _ _ _ _ _ A _
7			I	1 _ _, 3 _ _
			III	CR
8			III	CC, G1, G2, N1, N2, 0X, TP, MT, TC, FC, F1
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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