Honeywell

ST 3000 Smart Transmitter

Series 900 Flange Mounted Liquid Level Models

STF924	0 to 400 inH_2O	0 to 1000 mbar
STF932	0 to 100 psi	0 to 7 bar
STF92F	0 to 400 inH_2O	0 to 1000 mbar
STF93F	0 to 100 psi	0 to 7 bar

34-ST-03-68
10/2002

Specification and Model Selection Guide

Introduction

In 1983, Honeywell introduced the first Smart Pressure Transmitter— the ST 3000®. In 1989, Honeywell launched the first all digital, bi-directional protocol for smart field devices. Today, its ST 3000 Series 900 Flange-mount Pressure Transmitters continue to bring proven “smart” technology to a wide spectrum of pressure measurement applications. Flange-mount transmitters are offered with a variety of tank connections including ANSI flanges and sanitary. Applications include gauge pressure measurement in pressure vessels in the chemical industry as well as level applications in both the chemical and hydrocarbon processing industries with either wet or dry legs on the low side. Versatility is made possible though compound characterization of the meter body as well as the ability to measure a broad range of differential pressures.

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

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

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

Figure 1—Series 900 Flange Mounted Pressure Transmitters feature proven piezoresistive sensor technology.

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

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

Maureen Atchison, DuPont
Site Electrical & Instrumentation Leader

Description

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

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

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

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

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

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

Features

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

Specifications

Operating Conditions – All Models

Parameter	Reference Condition (at zero static)		Rated Condition		Operative Limits		Transportation and Storage	
	°C	°F	°C	°F	°C	°F	°C	°F
Ambient Temperature	25 ±1	77 ±2	-40 to 85	-40 to 158	-40 to 85	-40 to 185	-55 to 125	-67 to 257
Meter Body Temperature	25 ±1	77 ±2	-40 to 110*	-40 to 230*	-40 to 125	-40 to 257	-55 to 125	-67 to 257
Process Interface Temperature STF924, STF932 only	25 ±1	77 ±2	-40 to 110**	-40 to 230**	-40 to 175†	-40 to 350†	-55 to 125	-67 to 257
Humidity %RH	10 to 55		0 to 100		0 to 100		0 to 100	
Overpressure (Flange Rating) ANSI Class 150 **psi**	0		265		210			
bar	0		18		14			
ANSI Class 300 **psi**	0		690		640			
bar	0		48		44			
Vacuum Region - Minimum Pressure								
mmHg absolute	atmospheric		25		2 (short term ††)			
inH$_2$O absolute	atmospheric		13		1 (short term ††)			
Supply Voltage, Current, and Load Resistance	**Voltage Range:** 10.8 to 42.4 Vdc at terminals **Current Range:** 3.0 to 21.8 mA **Load Resistance:** 0 to 1440 ohms (as shown in Figure 2)							

* For model STF932 with CTFE fill fluid, the rating is –15 to 110°C (5 to 230°F); for models STF92F and STF93F with CTFE fill fluid, the rating is –15 to 70°C (5 to 158°F).
** For model STF932 with CTFE fill fluid, the rating is –15 to 110°C (5 to 230°F).
† For CTFE fill fluid, the maximum temperature rating is 150°C (300°F).
†† Short term equals 2 hours at 70°C (158°F)

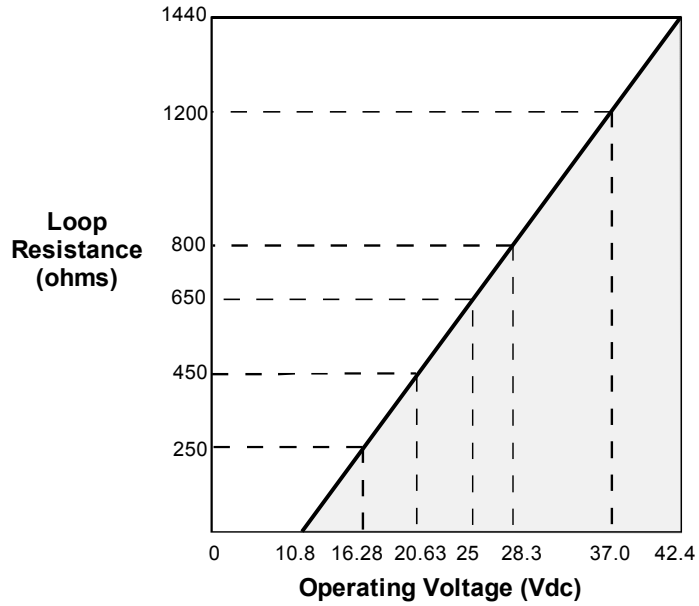


Figure 2 - Supply voltage and loop resistance chart.

Performance Under Rated Conditions* - Model STF924 (0 to 400 inH_2O/1000 mbar)

Parameter	Description
Upper Range Limit **inH_2O** **mbar**	400 (39.2°F/4°C is standard reference temperature for inH_2O range.) 1000
Minimum Span **inH_2O** **mbar**	25 62.5
Turndown Ratio	16 to 1
Zero Elevation and Suppression	No limit except minimum span within ±100% URL. Specifications valid from –100% to + 100% URL.
Accuracy (Reference – Includes combined effects of linearity, hysteresis, and repeatability) • *Accuracy includes residual error after averaging successive readings.* • *For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.*	**In Analog Mode:** ±0.10% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (25 inH_2O), accuracy equals: $\pm 0.05 + 0.05 \left(\frac{25\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.05 + 0.05 \left(\frac{62.5\ mbar}{span\ mbar}\right)$ in % span **In Digital Mode:** ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (25 inH_2O), accuracy equals: $\pm 0.025 + 0.05 \left(\frac{25\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.025 + 0.05 \left(\frac{62.5\ mbar}{span\ mbar}\right)$ in % span
Zero Temperature Effect per 28°C (50°F)	**In Analog Mode:** ±0.2625% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.0125 + 0.25 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.0125 + 0.25 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span **In Digital Mode:** ±0.25% of span. For span below reference point (50 inH_2O), effect equals: $\pm 0.25 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.25 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span
Combined Zero and Span Temperature Effect per 28°C (50°F)	**In Analog Mode:** ±0.50% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.25 + 0.25 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.25 + 0.25 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span **In Digital Mode:** ±0.475% of span. For span below reference point (50 inH_2O), effect equals: $\pm 0.225 + 0.25 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.225 + 0.25 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span
Zero Static Pressure Effect per 300 psi (20 bar)	±0.2125% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.0125 + 0.20 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.0125 + 0.20 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span
Combined Zero and Span Static Pressure Effect per 300 psi (20 bar)	±0.40% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.20 + 0.20 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.20 + 0.20 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span
Stability	±0.015% of URL per year

* 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.

Performance Under Rated Conditions* - Model STF932 (0 to 100 psi/7 bar)

Parameter	Description
Upper Range Limit **psi** **bar**	100 7
Minimum Span **psi** **bar**	5 0.35
Turndown Ratio	20 to 1
Zero Elevation and Suppression	No limit except minimum span within ±100% URL. Specifications valid from –100% to + 100% URL.
Accuracy (Reference – Includes combined effects of linearity, hysteresis, and repeatability) • *Accuracy includes residual error after averaging successive readings.* • *For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.*	**In Analog Mode:** ±0.10% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (20 psi), accuracy equals: $\pm 0.05 + 0.05 \left(\frac{20 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.05 + 0.05 \left(\frac{1.4 \text{ bar}}{\text{span bar}}\right)$ in % span **In Digital Mode:** ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (20 psi), accuracy equals: $\pm 0.025 + 0.05 \left(\frac{20 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.025 + 0.05 \left(\frac{1.4 \text{ bar}}{\text{span bar}}\right)$ in % span
Zero Temperature Effect per 28°C (50°F)	**In Analog Mode:** ±0.2625% of span. For URV below reference point (30 psi), effect equals: $\pm 0.0125 + 0.25 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.0125 + 0.25 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span **In Digital Mode:** ±0.25% of span. For URV below reference point (30 psi), effect equals: $\pm 0.25 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.25 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span
Combined Zero and Span Temperature Effect per 28°C (50°F)	**In Analog Mode:** ±0.50% of span. For URV below reference point (30 psi), effect equals: $\pm 0.25 + 0.25 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.25 + 0.25 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span **In Digital Mode:** ±0.475% of span. For URV below reference point (30 psi), effect equals: $\pm 0.225 + 0.25 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.225 + 0.25 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span
Zero Static Pressure Effect per 300 psi (20 bar)	±0.2125% of span. For URV below reference point (30 psi), effect equals: $\pm 0.0125 + 0.20 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.0125 + 0.20 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span
Span Static Pressure Effect per 300 psi (20 bar)	±0.40% of span. For URV below reference point (30 psi), effect equals: $\pm 0.20 + 0.20 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.20 + 0.20 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span
Stability	±0.04% of URL per year

* 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.

Performance Under Rated Conditions* - Model STF92F (0 to 400 inH_2O/25 mbar)

Parameter	Description
Upper Range Limit **inH_2O** **mbar**	400 (39.2°F/4°C is standard reference temperature for inH_2O range.) 25
Minimum Span **inH_2O** **mbar**	25 62
Turndown Ratio	16 to 1
Zero Elevation and Suppression	–5 to +100% URL
Accuracy (Reference – Includes combined effects of linearity, hysteresis, and repeatability) • *Accuracy includes residual error after averaging successive readings.* • *For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.*	**In Analog Mode:** ±0.10% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (25 inH_2O), accuracy equals: $\pm 0.05 + 0.05 \left(\frac{25\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.05 + 0.05 \left(\frac{62.5\ mbar}{span\ mbar}\right)$ in % span **In Digital Mode:** ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (25 inH_2O), accuracy equals: $\pm 0.025 + 0.05 \left(\frac{25\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.025 + 0.05 \left(\frac{62.5\ mbar}{span\ mbar}\right)$ in % span
Zero Temperature Effect per 28°C (50°F)	**In Analog Mode:** ±0.1625% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.0125 + 0.15 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.0125 + 0.15 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span **In Digital Mode:** ±0.15% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.15 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.15 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span
Combined Zero and Span Temperature Effect per 28°C (50°F)	**In Analog Mode:** ±0.25% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.10 + 0.15 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.10 + 0.15 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span **In Digital Mode:** ±0.225% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.075 + 0.15 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.075 + 0.15 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span
Zero Static Pressure Effect per 1000 psi (70 bar)	±0.1625% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.0125 + 0.15 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.0125 + 0.15 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span
Combined Zero and Span Static Pressure Effect per 1000 psi (70 bar)•	±0.30% of span. For URV below reference point (50 inH_2O), effect equals: $\pm 0.15 + 0.15 \left(\frac{50\ inH_2O}{span\ inH_2O}\right)$ or $\pm 0.15 + 0.15 \left(\frac{125\ mbar}{span\ mbar}\right)$ in % span
Stability	±0.015% of URL per year

* 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.

Performance Under Rated Conditions* - Model STF93F (0 to 100 psi/7 bar)

Parameter	Description
Upper Range Limit **psi** **bar**	100 7
Minimum Span **psi** **bar**	5 0.35
Turndown Ratio	20 to 1
Zero Elevation and Suppression	–5 to +100% URL
Accuracy (Reference – Includes combined effects of linearity, hysteresis, and repeatability) • *Accuracy includes residual error after averaging successive readings.* • *For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.*	**In Analog Mode:** ±0.10% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (20 psi), accuracy equals: $\pm 0.05 + 0.05 \left(\frac{20 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.05 + 0.05 \left(\frac{1.4 \text{ bar}}{\text{span bar}}\right)$ in % span **In Digital Mode:** ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (20 psi), accuracy equals: $\pm 0.025 + 0.05 \left(\frac{20 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.025 + 0.05 \left(\frac{1.4 \text{ bar}}{\text{span bar}}\right)$ in % span
Zero Temperature Effect per 28°C (50°F)	**In Analog Mode:** ±0.1625% of span. For URV below reference point (30 psi), effect equals: $\pm 0.0125 + 0.15 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.0125 + 0.15 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span **In Digital Mode:** ±0.15% of span. For URV below reference point (30 psi), effect equals: $\pm 0.15 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.15 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span
Combined Zero and Span Temperature Effect per 28°C (50°F)	**In Analog Mode:** ±0.25% of span. For URV below reference point (30 psi), effect equals: $\pm 0.10 + 0.15 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.10 + 0.15 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span **In Digital Mode:** ±0.225% of span. For URV below reference point (30 psi), effect equals: $\pm 0.075 + 0.15 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.075 + 0.15 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span
Zero Static Pressure Effect per 1000 psi (70 bar)	±0.1625% of span. For URV below reference point (30 psi), effect equals: $\pm 0.0125 + 0.15 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.0125 + 0.15 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span
Combined Zero and Span Static Pressure Effect per 1000 psi (70 bar)	±0.30% of span. For URV below reference point (30 psi), effect equals: $\pm 0.15 + 0.15 \left(\frac{30 \text{ psi}}{\text{span psi}}\right)$ or $\pm 0.15 + 0.15 \left(\frac{2 \text{ bar}}{\text{span bar}}\right)$ in % span
Stability	±0.04% of URL per year

* 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.

Performance Under Rated Conditions - General for all Models

Parameter	Description
Output (two-wire)	Analog 4 to 20 mA or DE digital communications mode. Options available for FOUNDATION Fieldbus and HART protocol.
Supply Voltage Effect	0.005% span per volt.
Damping Time Constant	Adjustable from 0 to 32 seconds digital damping.
CE Conformity (Europe)	89/336/EEC, Electromagnetic Compatibility (EMC) Directive.
Lightning Protection Option **(Code "LP")**	Leakage Current: 10 microamps max. @ 42.4 VDC, 93°C Impulse Rating: 10/20 µ sec. 5,000 Amps (50 strikes) 10,000 Amps (20 strikes) (rise/decay) 10/1000 µ sec. 250 Amps (1000 strikes) 500 Amps (400 strikes)

Physical and Approval Bodies

Parameter	Description
Barrier Diaphragms Material (Wetted)	316L SS, Hastelloy C-276
Gasket Ring Material (Wetted)	316 SS, Hastelloy C-276*
Extension Tube Material (Wetted)	316 SS
Process Head and Adapter Flange Material	316 SS, Carbon Steel (zinc-plated), Hastelloy C-276*
Sanitary Flange Mount	All parts are 316 SS.
Process Head Gaskets	Teflon is standard.
Meter Body Bolting	Carbon Steel or 316 SS (NACE) bolts.
Mounting Flange	
STF924, STF932	**Flush or Extended Diaphragm**: Zinc Chromate plated Carbon Steel, 304 SS, or 316 SS. **Sanitary Design:** 316 SS
STF92F, STF93F	316 SS ***(NOTE: Mounting Flange is process wetted.)***
Fill Fluid	Silicone oil or CTFE (Chlorotrifluoroethylene)
Electronic Housing	Epoxy-Polyester hybrid paint. Low Copper-Aluminum. Meets NEMA 4X (watertight) and NEMA 7 (explosion proof). Stainless steel optional.
Process Connections	
All Models	**Process Head:** 1/4-inch NPT; 1/2-inch NPT with adapter, standard option.
STF924, STF932	**Flange:** 3 or 4-inch Class 150 or 300 ANSI; DN80-PN40 or DN100-PN40 DIN flange. **Extended Diaphragm:** 2, 4, or 6 inches (50, 101, 152 mm) long. **Sanitary Flange Mount:** 4-inch sanitary tank spud with Ladish 4-inch Tri-Clamp. See Specification 34-ST-03-26.
STF92F, STF93F	3-inch, Class 150 ANSI flange.

Table continued on next page ⇒

Physical and Approval Bodies, continued

Parameter	Description
Wiring	Accepts up to 16 AWG (1.5 mm diameter).
Mounting	See Figure 3 for typical flange mounting arrangement.
Dimensions	See Figures 4, 5, and 6
Net Weight STF924, STF932 STF92F, STF93F	 **Flush Model:** 26.5 pounds (12 Kg) 15.4 pounds (7 Kg)
Approval Bodies **- Hazardous Areas**	Approved as explosion proof and intrinsically safe for use in Class I, Division 1, Groups A, B, C, D locations, and nonincendive for Class I, Division 2, Groups A, B, C, D locations. Approved EEx ia IIC T4, T5, T6 and EEx d IIC T5, T6 per ATEX standards. See attached Model Selection Guide for options.
Pressure Equipment Directive (97/23/EC)	The ST 3000 pressure transmitters listed in this Specification have no pressurized internal volume or have a pressurized internal volume rated less than 1,000 bar (14,500 psig) and/or have a maximum volume of less than 0.1 liter. Therefore, these transmitters are either; not subject to the essential requirements of the directive 97/23/EC (PED, Annex 1) and shall not have the CE mark, or the manufacturer has the free choice of a module when the CE mark is required for pressures > 200 bar (2,900 psig).

- Flush design only.

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.

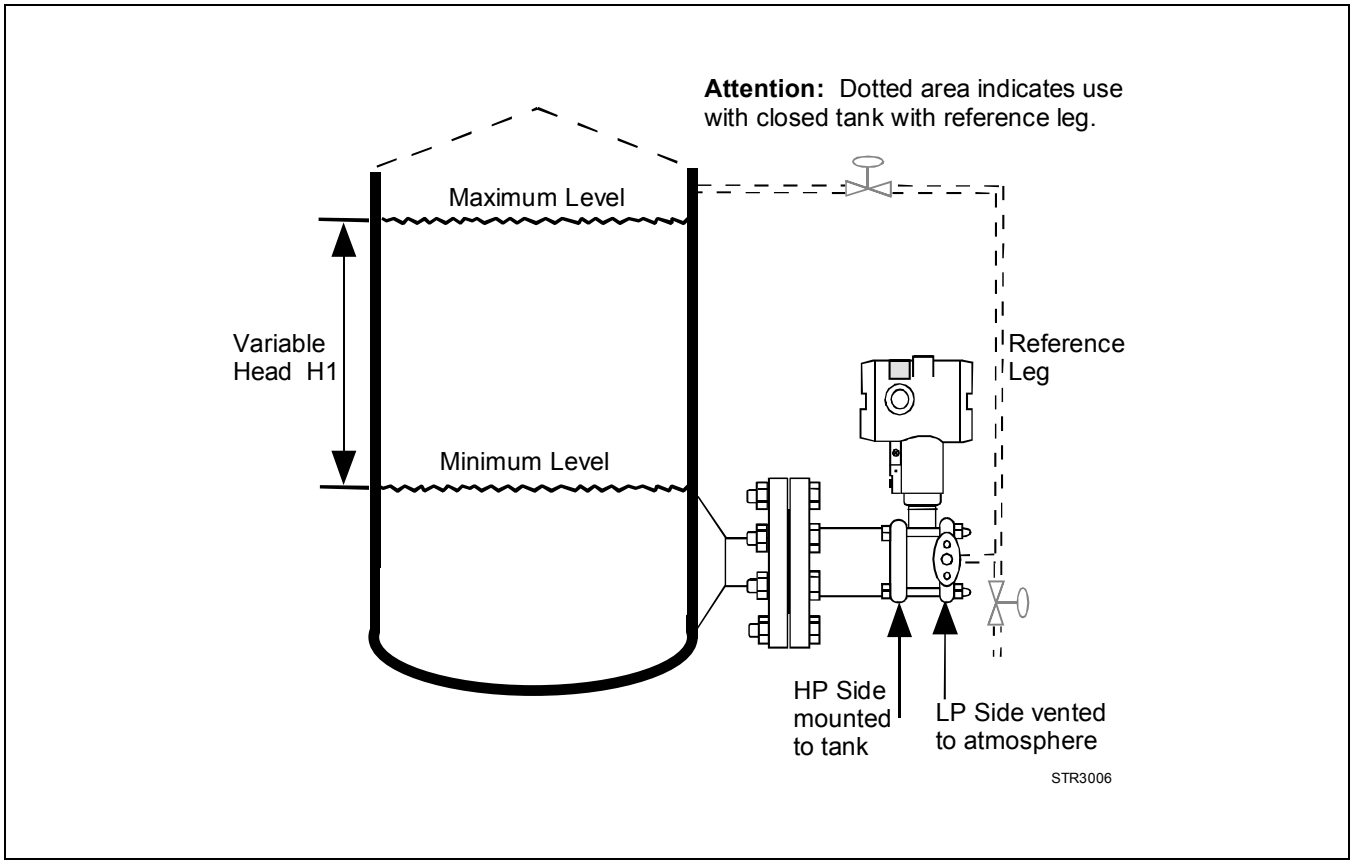
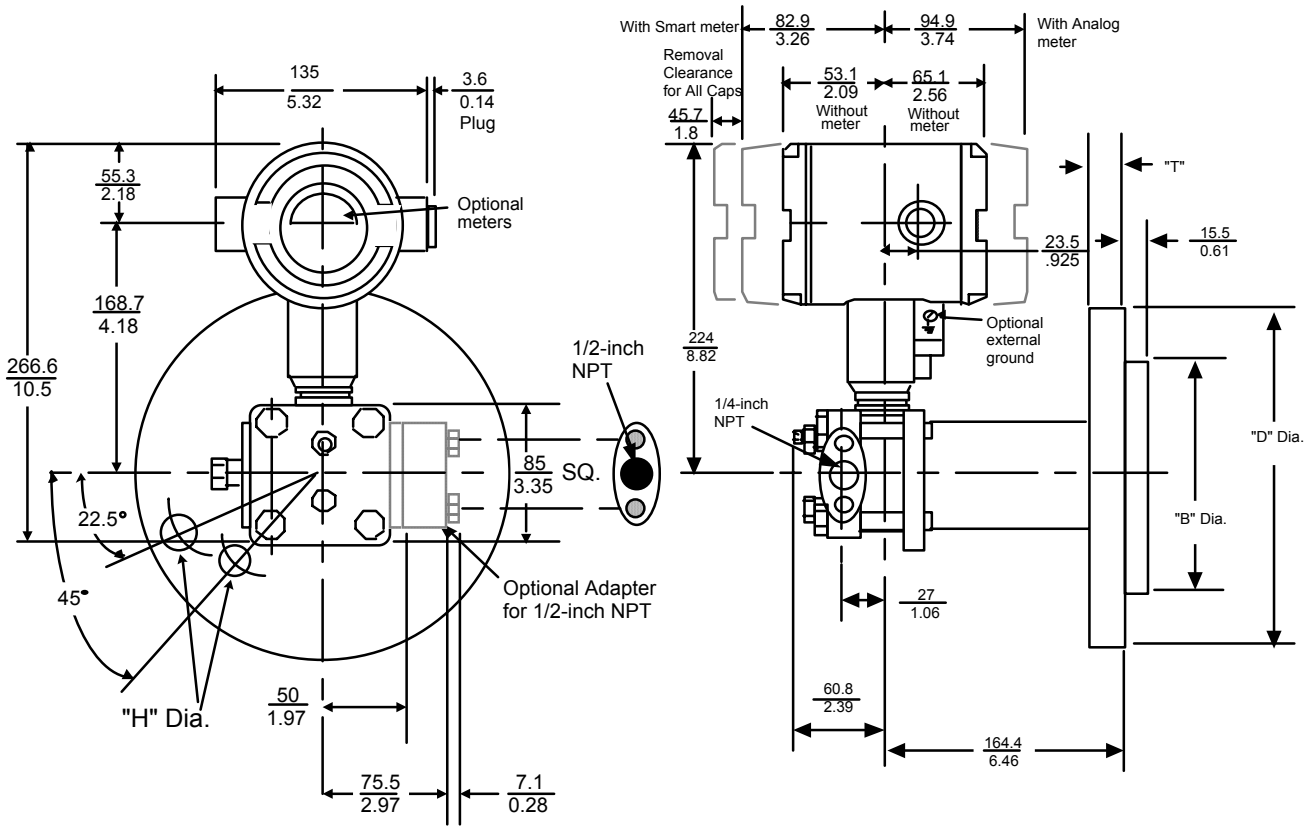


Figure 3—Typical mounting arrangement for flange mounted liquid level transmitter

Reference Dimensions: millimeters / inches



Description	"T"	"D" Flange Dia.	Bolt Hole		Bolt Circle	"B" Dia.
			"H"Diameter	Number		
3-inch, ANSI Class 150	24 / 0.94	190.5 / 7.50	19 / 0.75	4	152.4 / 6.00	127 / 5.00
3-inch, ANSI Class 300	28.4 / 1.12	209.6 / 8.25	22.4 / 0.88	8	168.1 / 6.62	127 / 5.00
DIN DN80-PN40	24 / 0.94	200 / 7.87	18 / 0.71	8	160 / 6.30	138 / 5.43
4-inch, ANSI Class 150	24 / 0.94	228.6 / 9.00	19 / 0.75	8	190.5 / 7.50	157.2 / 6.19
4-inch, ANSI Class 300	31.8 / 1.25	254 / 10.0	22.4 / 0.88	8	200.2 / 7.88	157.2 / 6.19
DIN DN100-PN40	24 / 0.94	235 / 9.25	23 / 0.90	8	190.5 / 7.50	162 / 6.38

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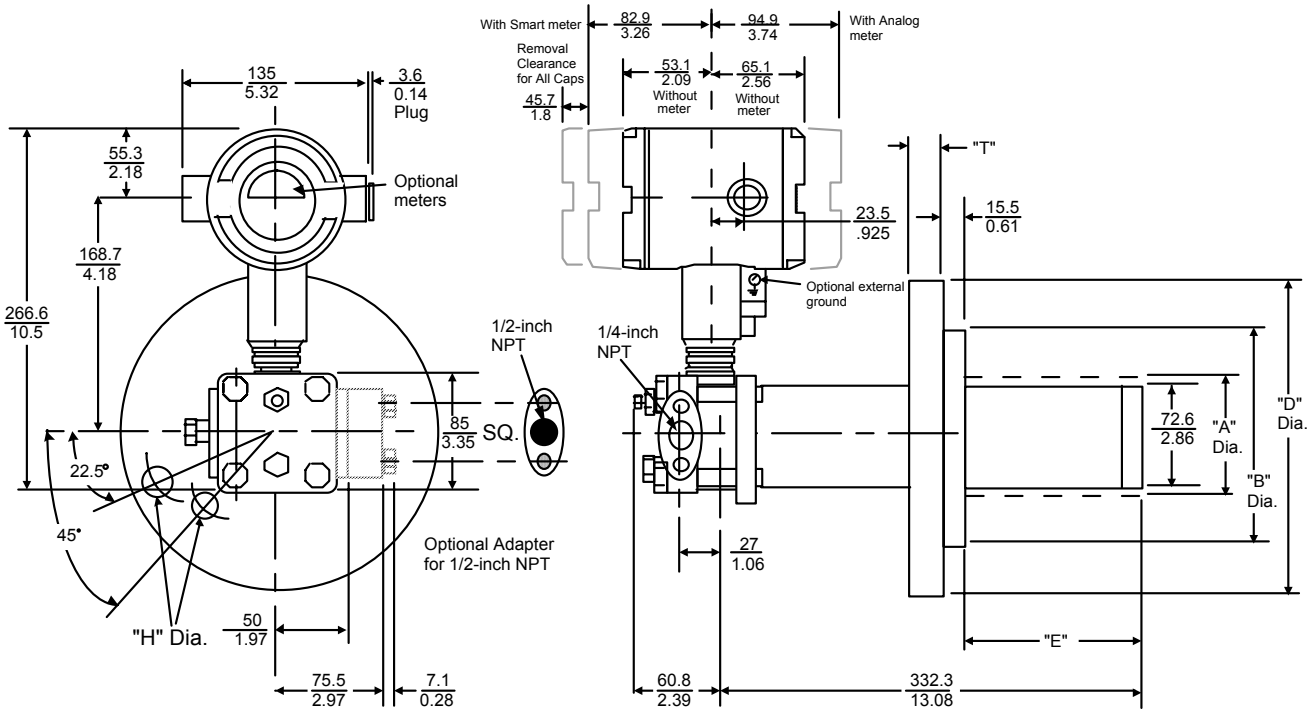
Figure 4—Approximate mounting dimensions for STF924 and STF932 flush diaphragm type

Reference Dimensions: millimeters / inches



Description	"T"	"D" Flange Dia.	Bolt Hole		Bolt Circle	"A" Dia. (Optional)	"B" Dia.	Extension E		
			"H"Dia.	Number				E 2-inch	E 4-inch	E 6-inch
3-inch, ANSI Class 150	24 / 0.94	190.5 / 7.50	19 / 0.75	4	152.4 / 6.00	N/A	127 / 5.00	50.8 / 2.00	101.6 / 4.00	152.4 / 6.00
3-inch, ANSI Class 300	28.4 / 1.12	209.6 / 8.25	22.4 / 0.88	8	168.1 / 6.62		127 / 5.00			
DIN DN80-PN40	24 / 0.94	200 / 7.87	18 / 0.71	8	160 / 6.30		138 / 5.43			
4-inch, ANSI Class 150	24 / 0.94	228.6 / 9.00	19 / 0.75	8	190.5 / 7.50	95.2 / 3.75	157.2 / 6.19	50.8 / 2.00	101.6 / 4.00	152.4 / 6.00
4-inch, ANSI Class 300	31.8 / 1.25	254 / 10.0	22.4 / 0.88	8	200.2 / 7.88		157.2 / 6.19			
DIN DN100-PN40	24 / 0.94	235 / 9.25	23 / 0.90	8	190.5 / 7.50		162 / 6.38			

NOTE: See Specification 34-ST-03-26 for Sanitary Flange Mount version.

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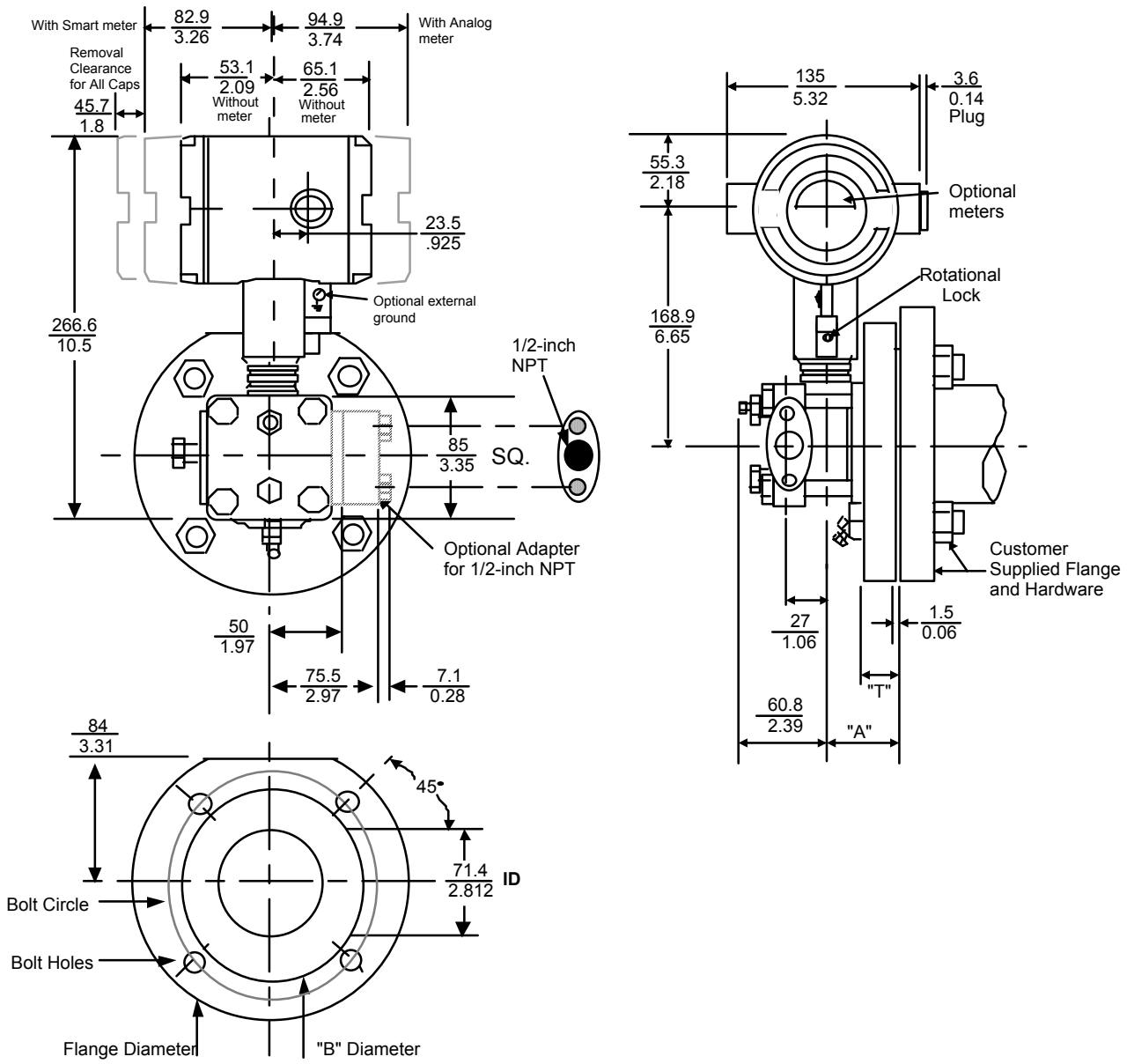
Figure 5—Approximate mounting dimensions for STF924 and STF932 extended diaphragm type

Reference Dimensions: millimeters / inches



Description	"T"	Flange Dia.	Bolt Hole/Studs		Bolt Circle	"A"	"B" Dia.
			Diameter	Number			
3-inch, ANSI Class 150	24 / 0.94	190.5 / 7.50	19 / 0.75	4	152.4 / 6.00	49.2 / 1.94	127 / 5.00

24246

Figure 6—Approximate mounting dimensions for STF92F and STF93F pseudo flange type

Reference Dimensions: millimeters / inches

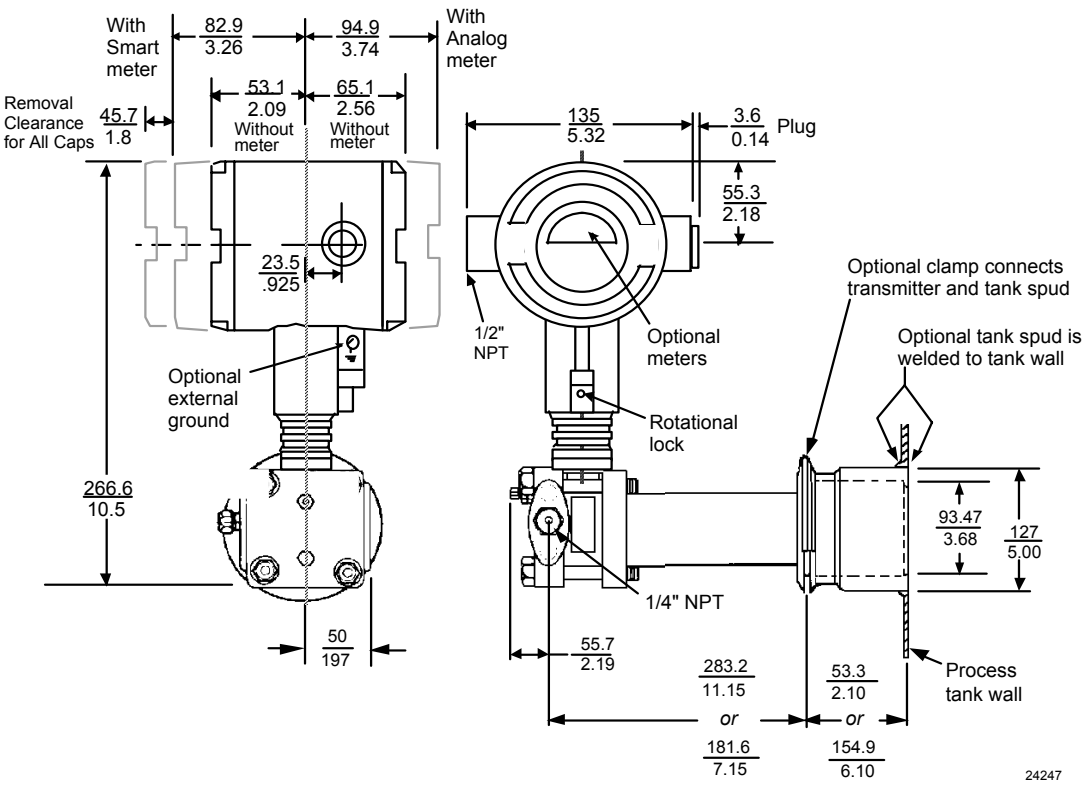


Figure 7—Typical mounting dimensions for Flange-Mounted Liquid Level Transmitter with sanitary flange for 4-inch diameter tank spud—For Reference Only

Options

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

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

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

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

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

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

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

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

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

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

Ordering Information

Contact your nearest Honeywell sales office, or

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

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

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

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

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

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

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

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

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

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

Model Selection Guide (34-ST-16-30)

Instructions

- Select the desired Key Number. The arrow to the right marks the selection available.
- Make one selection from each table, I and II, using the column below the proper arrow.
  Select as many Table III options as desired (if no options or approvals are desired, specify 9X).
  A (◆) denotes unrestricted availability. A letter denotes restricted availability.
  Restrictions follow Table IV.

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

KEY NUMBER

Span	Selection	Availability	
0-25 to 0-400 in$H_2$0/0-62.2 to 0-1000 mbar Compound Characterized	STF924	↓	
0-5 to 0-100 psi/0-0.34 to 0-7 bar Compound Characterized	STF932	↓	
0-25 to 0-400 in$H_2$0/0-62.2 to 0-1000 mbar	STF92F		↓
0-5 to 0-100 psi/0-0.34 to 0-7 bar	STF93F		↓

TABLE I - METER BODY

	Design	Ref. Hd.	Vent/Drain Valve ** on Ref. Hd	Barrier Diaphragms (wetted)	Diaphragm Plate (wetted)	Extension (wetted)			
Materials	Flush	Carbon* Steel	316 SS	316 LSS	316 SS	N/A	A _ _	◆	
				Hast C	316 SS		W _ _	◆	
				Hast C	Hast C		B _ _	◆	
		316 SS		316 LSS	316 SS		E _ _	◆	
				Hast C	316 SS		X _ _	◆	
				Hast C	Hast C		F _ _	◆	
		Hast C	Hast C	Hast C	Hast C		J _ _	◆	
	Extended	Carbon* Steel	316 SS	316 LSS	316 SS	316 SS	M _ _	◆	
				Hast C			N _ _	◆	
		316 SS		316 LSS			R _ _	◆	
				Hast C			S _ _	◆	
	Pseudo Flange	Carbon* Steel	316 SS	316 LSS	N/A	N/A	A _ _		◆
				Hast C			B _ _		◆
		316 SS		316 LSS			E _ _		◆
				Hast C			F _ _		◆
	Sanitary Flange (3-A)	316 SS	316SS	316 LSS	316 SS	316 SS	Z _ _	w	
Fill Fluid (Meter Body & Flange)	Silicone						_ 1 _	◆	◆
	CTFE						_ 2 _	◆	◆

	Reference Head	Flange			
Process Connection	1/4" NPT	High Pressure Side	_ _ A	◆	◆
		Low Pressure Side	_ _ C		◆
	1/2" NPT (with Adapter)	High Pressure Side	_ _ H	t	t
		Low Pressure Side	_ _ K		t

* Carbon Steel heads are zinc-plated. Not recommended for water service due to hydrogren migration. Use Stainless Steel heads.

** Vent/Drains are Teflon coated for lubricity.

Model Selection Guide, cont.

TABLE II - FLANGE ASSEMBLY			STF9 Selection	Availability 24 32	Availability 2F 3F
No Selection			0 _ _ _ _	◆	◆
Flange (ANSI Flanges have 125-500 AARH Surface Finish)	3" ANSI Class 150	Carbon Steel (non-wetted)	_ 1 _ _ _	y	
	3" ANSI Class 300		_ 2 _ _ _	y	
	DN80-PN40 DIN		_ 3 _ _ _	y	
	4" ANSI Class 150		_ 4 _ _ _	◆	
	4" ANSI Class 300		_ 5 _ _ _	◆	
	DN100-PN40 DIN		_ 6 _ _ _	◆	
	3" ANSI Class 150	304 SS (non-wetted)	_ A _ _ _	y	
	3" ANSI Class 300		_ B _ _ _	y	
	DN80-PN40 DIN		_ C _ _ _	y	
	4" ANSI Class 150		_ D _ _ _	◆	
	4" ANSI Class 300		_ E _ _ _	◆	
	DN100-PN40 DIN		_ F _ _ _	◆	
	3" ANSI Class 150	316 SS (non-wetted)	_ H _ _ _	y	
	3" ANSI Class 300		_ J _ _ _	y	
	DN80-PN40 DIN		_ K _ _ _	y	
	4" ANSI Class 150		_ L _ _ _	◆	
	4" ANSI Class 300		_ M _ _ _	◆	
	DN100-PN40 DIN		_ N _ _ _	◆	
	Pseudo Flange on Standard DP	316 SS			
	3" ANSI Class 150 w/Vent/Drain	(wetted)	_ R _ _ _		◆
	3" ANSI Class 150 w/o Vent/Drain		_ P _ _ _		◆
	3-A Sanitary Flange for 4" Ladish Tri-Clamp	316 SS (wetted)	_ S _ _ _	w	
Gasket Ring (wetted)	No Selection		_ _ 0 _ _	w	◆
	Flush Design	316 SS	_ _ 1 _ _	g	
		Hast C	_ _ 2 _ _	g	
	Extended Design	316 SS	_ _ 5 _ _	v	
Extension (wetted)	No Selection		_ _ _ 0 _		◆
	Flush		_ _ _ F _	h	
	Diameter	**Length**			
	2.86 Inches (for 3" or 4 " spud) ***	2 inches	_ _ _ 1 _	v	
		4 inches	_ _ _ 2 _	v	
		6 inches	_ _ _ 3 _	v	
	3.75 Inches (optional for 4" spud) ***	2 inches	_ _ _ 5 _	v	
		4 inches	_ _ _ 6 _	v	
		6 inches	_ _ _ 7 _	v	
	4 Inch Nominal Sanitary (for sanitary spud) ***	2 inches	_ _ _ A _	w	
		6 inches	_ _ _ B _	w	
No Selection			_ _ _ _ 0	◆	◆

*** For part numbers and pricing information on Tank Spuds refer to page ST-91 (Supplementary Accessories & Kits).

Model Selection Guide, cont.

TABLE III - OPTIONS	Selection	STF9 Availability 24 32	2F 3F	
None	00	◆	◆	
HART® Protocol Compatible Electronics	HC	e	e	b
FOUNDATION Fieldbus Communications	FF	r	r	
Analog Meter (0-100 Even 0-10 Square Root)	ME	◆	◆	b
Smart Meter	SM	◆	◆	
Custom Configuration of Smart Meter	CI	m	m	
Local Zero	LZ	x	x	b
Local Zero and Span	ZS	s	s	
Lightning Protection	LP	◆	◆	
Custom Calibration and I.D. in Memory	CC	◆	◆	
Transmitter Configuration	TC	◆	◆	
Write Protection	WP	◆	◆	
316SS (NACE) Bols and 304SS (NACE) Retaining Ring for Heads	CR	◆	◆	
Stainless Steel Customer Wired-On Tag (4 lines, 28 characters per line, customer supplied information)	TG	◆	◆	
Stainless Steel Customer Wired-On Tag (blank)	TB	◆	◆	
Adapter Flange - 1/2" NPT St. Steel	S1	c	c	b
Adapter Flange - 1/2" NPT Hastelloy-C	T1	c	c	
Modified DIN Process Heads - 316SS	DN	z	z	
316 ST.ST. Electronics Housing - *with M20 Conduit Connections*	SH	n	n	
1/2" NPT to M20 316SS Conduit Adapter (BASEEFA EEx d IIC)	A1	n	n	b
1/2" NPT to 3/4" NPT 316 SS Conduit Adapter	A2	u	u	
Stainless Steel Housing with M20 to 1/2" NPT 316 SS Conduit Adapter *(use for FM and CSA Approvals)*	A3	i	i	
Blind DIN SS Flanges Mounted with NACE Bolts	B1	d	d	
Clean Transmitter for Oxygen or Chlorine Service with Certificate	0X	j	j	
Over-Pressure Leak Test with F3392 Certificate	TP	◆	◆	
Calibration Test Report and Certificate of Conformance (F3399)	F1	◆	◆	b
Certificate of Conformance (F3391)	F3	◆	◆	
Certificate of Origin (F0195)	F5	◆	◆	
FMEDA (SIL) Certificate	F6	◆	◆	
NACE Certificate (F0198)	F7	o	o	
Additional Warranty - 1 year	W1	◆	◆	
Additional Warranty - 2 years	W2	◆	◆	b
Additional Warranty - 3 years	W3	◆	◆	
Additional Warranty - 4 years	W4	◆	◆	

Table III continued next page

Model Selection Guide, cont.

TABLE III - OPTIONS (continued)

Approval Body	Approval Type	Location or Classification	Selection	STF9 Availability 24 32	2F 3F
No hazardous location approvals			9X	◆	◆
Factory Mutual	Explosion Proof	Class I, Div. 1, Groups A,B,C,D	1C	◆	◆
	Dust Ignition Proof	Class II, III Div. 1, Groups E,F,G			
	Non-Incendive	Class I, Div. 2, Groups A,B,C,D			
	Intrinsically Safe	Class I, II, III, Div. 1, Groups A,B,C,D,E,F,G			
CSA	Explosion Proof	Class I, Div. 1, Groups B,C,D	2J	◆	◆
	Dust Ignition Proof	Class II, III, Div. 1, Groups E,F,G			
	Intrinsically Safe	Class I, II, III, Div. 1, Groups A,B,C,D,E,F,G			
SA (Australia)	Intrinsically Safe	Ex ia IIC T4	4G	◆	◆
	Non-sparking	Ex n IIC T6 (T4 with SM option)			
ATEX*	Intrinsically Saft, Zone 0/1	⟨Ex⟩ II 1 G EEx ia IIC T4, T5,T6	3S	◆	◆
	Flameproof, Zone 1	⟨Ex⟩ II 2 G EEx d IIC T5, T6, Enclosure IP 66/67	3D	◆	◆
	Non-Sparking, Zone 2	⟨Ex⟩ II 3 G EEx nA, IIC T6 (Honeywell). Enclosure IP 66/67	3N	◆	◆

b

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

97/23/EC Pressure Equipment Directive (PED)

The ST 3000 pressure transmitters listed in this Model Selection Guide are in conformity with the essential requirements of the PED. 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, is available upon request

TABLE IV

Factory Identification	XXXX	◆	◆

Model Selection Guide, cont.

RESTRICTIONS

Restriction		Available Only With		Not Available With
Letter	**Table**	**Selection**	**Table**	**Selection**
a	Approval Body Pending			
b	Select only one option from this group			
c	I	_ _ H, _ _ K		
d	I III	E _ A, F _ A, R _ A, S _ A, X _ A, E _ C, F _ C DN		
e			III	4G
g	I	A _ _, B _ _, E _ _, F _ _, J _ _, W _ _, X _ _		
h			I II	M _ _,N _ _,R _ _,S _ _,Z _ _ _ _ 5, _ _, _ _ 0 _ _
i	III	1C or 2J		
j	I	_ 2 _		
m	III	SM		
n			III	1C, 2J
o	III	CR or B1		
r			III	TC, ME, 4G, 3S
s			III	FF, ME
t		Select from Table III S1, T1		
u	III	1C, 2J		
v	I	M _ _, N _ _, R _ _, S _ _		
w	I, II	Z _ _ - _ S0A _; Z _ _ - _ S0B _		
x	III	FF, SM		
y			II	_ _ _ 5 _, _ _ _ 6 _, _ _ _ 7 _
z	I	E _ A, F _ A, R _ A, S _ A, X _ A, E _ C, F _ C		

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

Model Selection Guide, cont.

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FOUNDATION™ is a trademark of the Fieldbus Foundation.

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