

## ST 3000 Smart Transmitter Series 900 Flange Mounted Liquid Level Models

STF924	0 to 400 inH <sub>2</sub> O	0 to 1000 mbar
STF932	0 to 100 psi	0 to 7 bar
STF92F	0 to 400 inH <sub>2</sub> O	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 through 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<sup>®</sup> 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

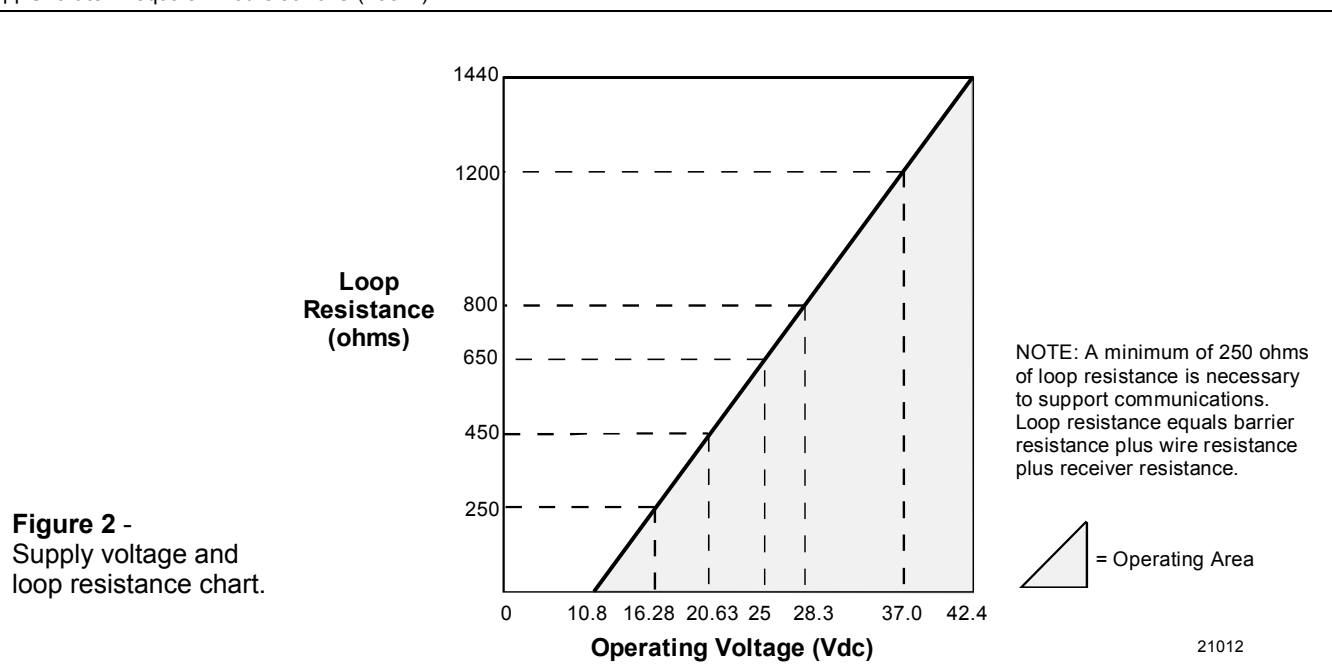
Parameter	Reference Condition (at zero static)		Rated Condition		Operative Limits		Transportation and Storage	
	°C	°F	°C	°F	°C	°F	°C	°F
Ambient Temperature	25 ±1	77 ±2	-40 to 85	-40 to 158	-40 to 85	-40 to 185	-55 to 125	-67 to 257
Meter Body Temperature	25 ±1	77 ±2	-40 to 110*	-40 to 230*	-40 to 125	-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 bar	0		265		210			
	0		18		14			
ANSI Class 300 psi bar	0		690		640			
	0		48		44			
Vacuum Region - Minimum Pressure								
mmHg absolute inH <sub>2</sub> O absolute	atmospheric		25		2 (short term ††)			
	atmospheric		13		1 (short term ††)			
Supply Voltage, Current, and Load Resistance	<b>Voltage Range:</b> 10.8 to 42.4 Vdc at terminals <b>Current Range:</b> 3.0 to 21.8 mA <b>Load Resistance:</b> 0 to 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)



**Performance Under Rated Conditions\* - Model STF924 (0 to 400 inH<sub>2</sub>O/1000 mbar)**

Parameter	Description
<b>Upper Range Limit</b> inH <sub>2</sub> O mbar	400 (39.2°F/4°C is standard reference temperature for inH <sub>2</sub> O range.) 1000
<b>Minimum Span</b> inH <sub>2</sub> O mbar	25 62.5
<b>Turndown Ratio</b>	16 to 1
<b>Zero Elevation and Suppression</b>	No limit except minimum span within ±100% URL. Specifications valid from –100% to + 100% URL.
<b>Accuracy</b> (Reference – Includes combined effects of linearity, hysteresis, and repeatability) <ul style="list-style-type: none"> <li>• Accuracy includes residual error after averaging successive readings.</li> <li>• For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.</li> </ul>	<b>In Analog Mode:</b> ±0.10% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (25 inH <sub>2</sub> O), accuracy equals: $\pm 0.05 + 0.05 \left( \frac{25 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \text{ or } \pm 0.05 + 0.05 \left( \frac{62.5 \text{ mbar}}{\text{span mbar}} \right) \text{ in } \% \text{ span}$ <b>In Digital Mode:</b> ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (25 inH <sub>2</sub> O), accuracy equals: $\pm 0.025 + 0.05 \left( \frac{25 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \text{ or } \pm 0.025 + 0.05 \left( \frac{62.5 \text{ mbar}}{\text{span mbar}} \right) \text{ in } \% \text{ span}$
<b>Zero Temperature Effect per 28°C (50°F)</b>	<b>In Analog Mode:</b> ±0.2625% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.0125 + 0.25 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \text{ or } \pm 0.0125 + 0.25 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right) \text{ in } \% \text{ span}$ <b>In Digital Mode:</b> ±0.25% of span. For span below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.25 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \text{ or } \pm 0.25 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right) \text{ in } \% \text{ span}$
<b>Combined Zero and Span Temperature Effect per 28°C (50°F)</b>	<b>In Analog Mode:</b> ±0.50% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.25 + 0.25 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \text{ or } \pm 0.25 + 0.25 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right) \text{ in } \% \text{ span}$ <b>In Digital Mode:</b> ±0.475% of span. For span below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.225 + 0.25 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \text{ or } \pm 0.225 + 0.25 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right) \text{ in } \% \text{ span}$
<b>Zero Static Pressure Effect per 300 psi (20 bar)</b>	±0.2125% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.0125 + 0.20 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \text{ or } \pm 0.0125 + 0.20 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right) \text{ in } \% \text{ span}$
<b>Combined Zero and Span Static Pressure Effect per 300 psi (20 bar)</b>	±0.40% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.20 + 0.20 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right) \text{ or } \pm 0.20 + 0.20 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right) \text{ in } \% \text{ span}$
<b>Stability</b>	±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 $\pm 100\%$ URL. Specifications valid from $-100\%$ to $+100\%$ URL.
<b>Accuracy</b> (Reference – Includes combined effects of linearity, hysteresis, and repeatability) <ul style="list-style-type: none"> <li>Accuracy includes residual error after averaging successive readings.</li> <li>For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.</li> </ul>	<b>In Analog Mode:</b> $\pm 0.10\%$ 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  <b>In Digital Mode:</b> $\pm 0.075\%$ 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)	<b>In Analog Mode:</b> $\pm 0.2625\%$ 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  <b>In Digital Mode:</b> $\pm 0.25\%$ 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)	<b>In Analog Mode:</b> $\pm 0.50\%$ 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  <b>In Digital Mode:</b> $\pm 0.475\%$ 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)	$\pm 0.2125\%$ 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)	$\pm 0.40\%$ 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	$\pm 0.04\%$ 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<sub>2</sub>O/25 mbar)**

Parameter		Description
Upper Range Limit	inH <sub>2</sub> O mbar	400 (39.2°F/4°C is standard reference temperature for inH <sub>2</sub> O range.) 25
Minimum Span	inH <sub>2</sub> O mbar	25 62
Turndown Ratio		16 to 1
Zero Elevation and Suppression		–5 to +100% URL
<b>Accuracy</b> (Reference – Includes combined effects of linearity, hysteresis, and repeatability) <ul style="list-style-type: none"> <li>Accuracy includes residual error after averaging successive readings.</li> <li>For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.</li> </ul>		<b>In Analog Mode:</b> ±0.10% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (25 inH <sub>2</sub> O), accuracy equals: $\pm 0.05 + 0.05 \left( \frac{25 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right)$ or $\pm 0.05 + 0.05 \left( \frac{62.5 \text{ mbar}}{\text{span mbar}} \right)$ in % span <b>In Digital Mode:</b> ±0.075% of calibrated span or upper range value (URV), whichever is greater, terminal based. For URV below reference point (25 inH <sub>2</sub> O), accuracy equals: $\pm 0.025 + 0.05 \left( \frac{25 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right)$ or $\pm 0.025 + 0.05 \left( \frac{62.5 \text{ mbar}}{\text{span mbar}} \right)$ in % span
Zero Temperature Effect per 28°C (50°F)		<b>In Analog Mode:</b> ±0.1625% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.0125 + 0.15 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right)$ or $\pm 0.0125 + 0.15 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right)$ in % span <b>In Digital Mode:</b> ±0.15% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.15 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right)$ or $\pm 0.15 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right)$ in % span
Combined Zero and Span Temperature Effect per 28°C (50°F)		<b>In Analog Mode:</b> ±0.25% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.10 + 0.15 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right)$ or $\pm 0.10 + 0.15 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right)$ in % span <b>In Digital Mode:</b> ±0.225% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.075 + 0.15 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right)$ or $\pm 0.075 + 0.15 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right)$ in % span
Zero Static Pressure Effect per 1000 psi (70 bar)		±0.1625% of span. For URV below reference point (50 inH <sub>2</sub> O), effect equals: $\pm 0.0125 + 0.15 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right)$ or $\pm 0.0125 + 0.15 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right)$ 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 <sub>2</sub> O), effect equals: $\pm 0.15 + 0.15 \left( \frac{50 \text{ inH}_2\text{O}}{\text{span inH}_2\text{O}} \right)$ or $\pm 0.15 + 0.15 \left( \frac{125 \text{ mbar}}{\text{span mbar}} \right)$ 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
<b>Accuracy</b> (Reference – Includes combined effects of linearity, hysteresis, and repeatability) <ul style="list-style-type: none"> <li>Accuracy includes residual error after averaging successive readings.</li> <li>For FOUNDATION Fieldbus use Digital Mode specifications. For HART use Analog Mode specifications.</li> </ul>	<b>In Analog Mode:</b> $\pm 0.10\%$ 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 <b>In Digital Mode:</b> $\pm 0.075\%$ 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
<b>Zero Temperature Effect per 28°C (50°F)</b>	<b>In Analog Mode:</b> $\pm 0.1625\%$ 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 <b>In Digital Mode:</b> $\pm 0.15\%$ 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
<b>Combined Zero and Span Temperature Effect per 28°C (50°F)</b>	<b>In Analog Mode:</b> $\pm 0.25\%$ 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 <b>In Digital Mode:</b> $\pm 0.225\%$ 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
<b>Zero Static Pressure Effect per 1000 psi (70 bar)</b>	$\pm 0.1625\%$ 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
<b>Combined Zero and Span Static Pressure Effect per 1000 psi (70 bar)</b>	$\pm 0.30\%$ 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
<b>Stability</b>	$\pm 0.04\%$ 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 $\mu$ sec. 5,000 Amps (50 strikes) 10,000 Amps (20 strikes) (rise/decay) 10/1000 $\mu$ 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 STF92F, STF93F	<b>Flush or Extended Diaphragm:</b> Zinc Chromate plated Carbon Steel, 304 SS, or 316 SS. <b>Sanitary Design:</b> 316 SS 316 SS <b>(NOTE: Mounting Flange is process wetted.)</b>
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 STF924, STF932 STF92F, STF93F	<b>Process Head:</b> 1/4-inch NPT; 1/2-inch NPT with adapter, standard option. <b>Flange:</b> 3 or 4-inch Class 150 or 300 ANSI; DN80-PN40 or DN100-PN40 DIN flange. <b>Extended Diaphragm:</b> 2, 4, or 6 inches (50, 101, 152 mm) long. <b>Sanitary Flange Mount:</b> 4-inch sanitary tank spud with Ladish 4-inch Tri-Clamp. See Specification 34-ST-03-26. 3-inch, Class 150 ANSI flange.

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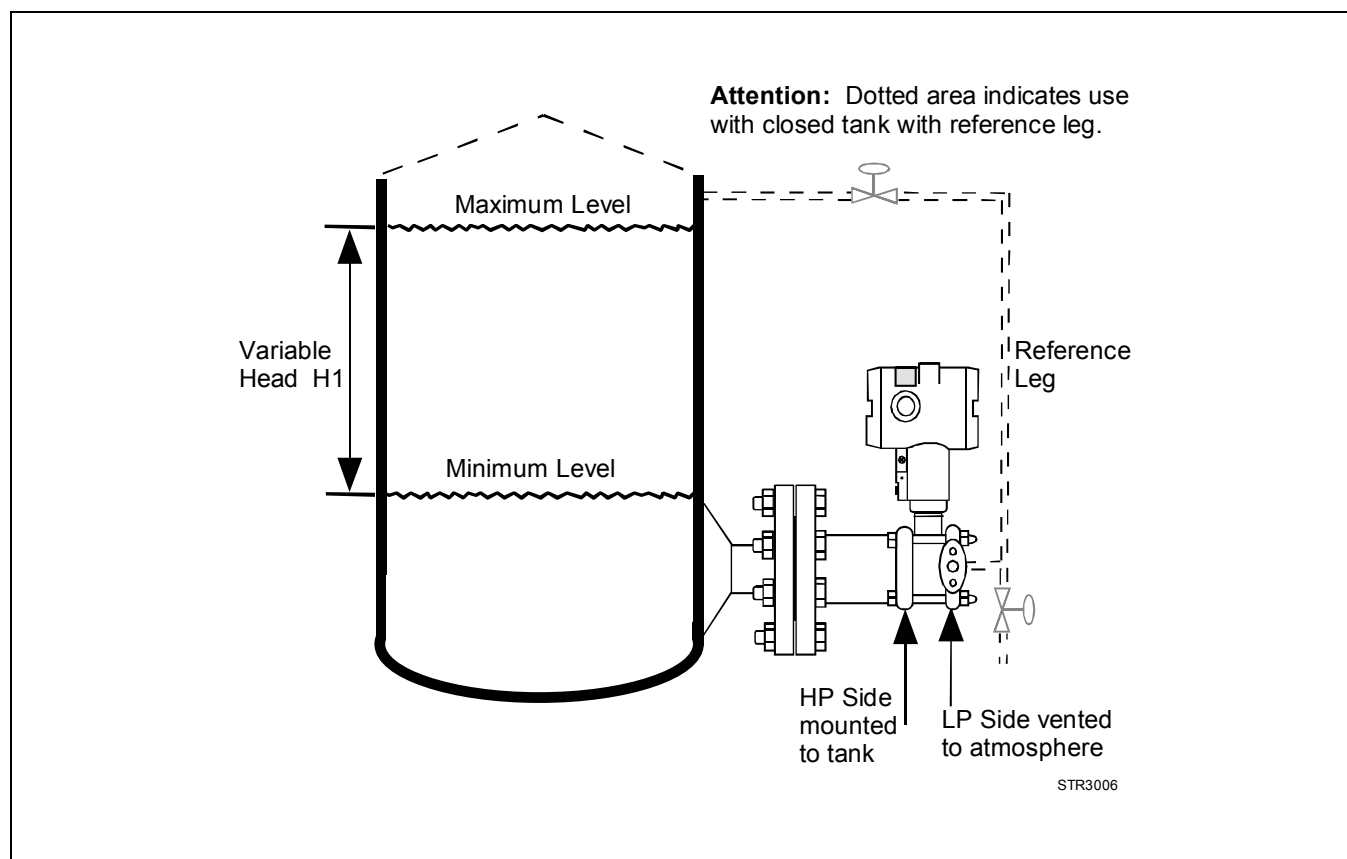


## Physical and Approval Bodies, continued

Parameter	Description
<b>Wiring</b>	Accepts up to 16 AWG (1.5 mm diameter).
<b>Mounting</b>	See Figure 3 for typical flange mounting arrangement.
<b>Dimensions</b>	See Figures 4, 5, and 6
<b>Net Weight</b> STF924, STF932 STF92F, STF93F	<b>Flush Model:</b> 26.5 pounds (12 Kg) 15.4 pounds (7 Kg)
<b>Approval Bodies</b> <b>- Hazardous Areas</b>	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.
<b>Pressure Equipment Directive (97/23/EC)</b>	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).

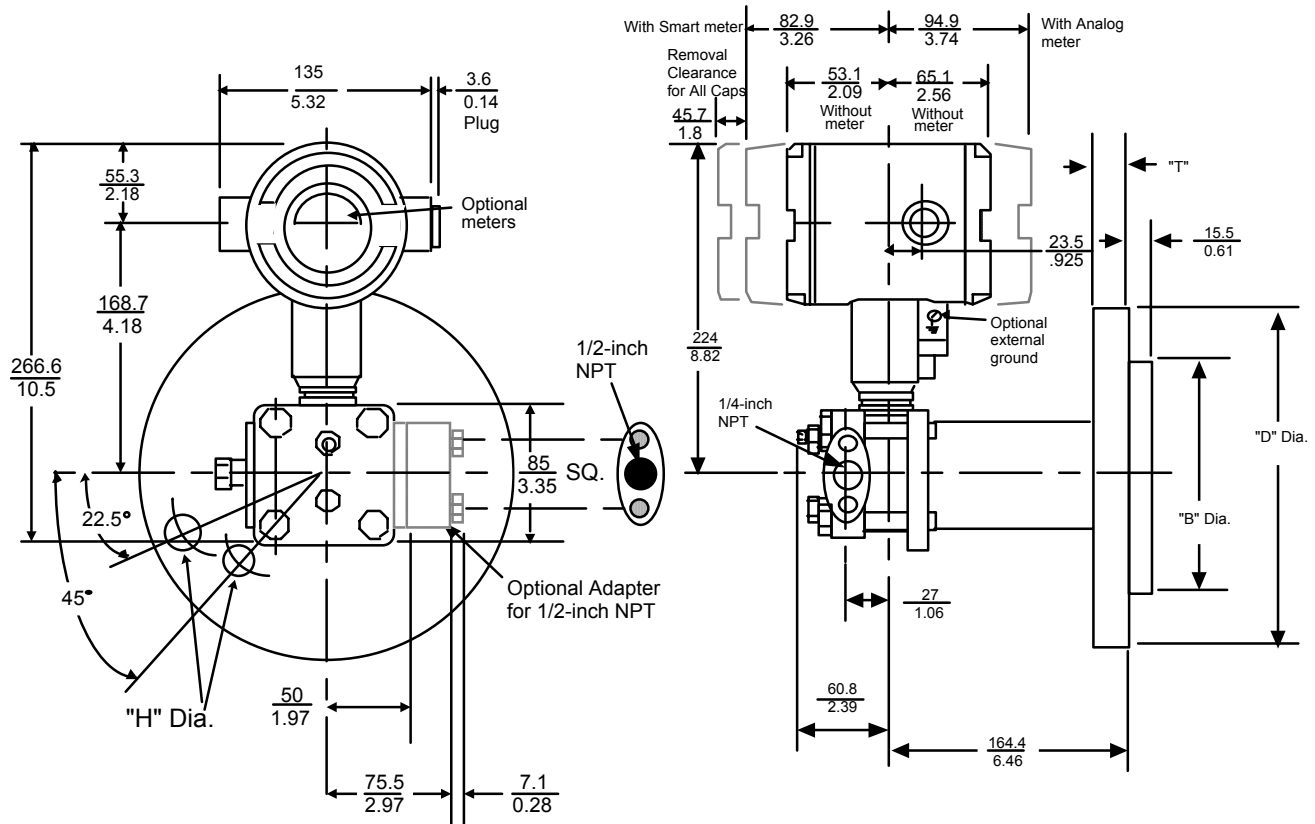
- Flush design only.

**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:  $\frac{\text{millimeters}}{\text{inches}}$

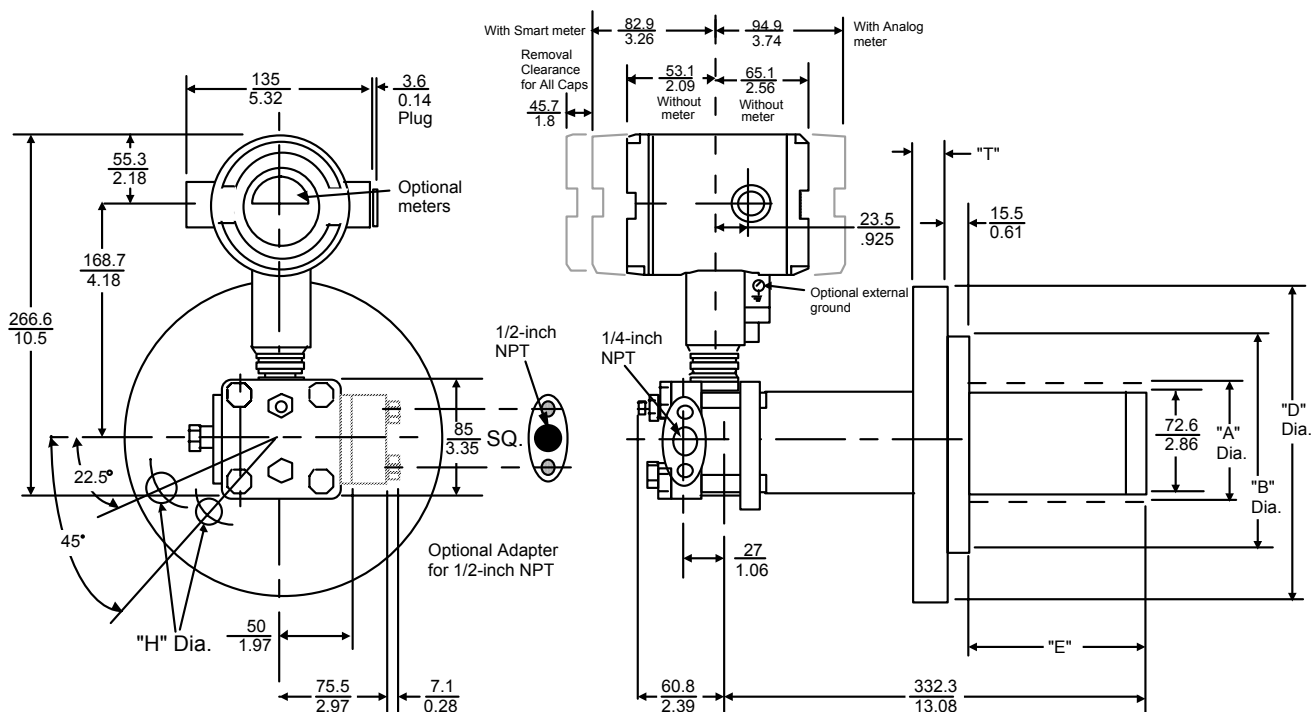


Description	"T"	"D" Flange Dia.	Bolt Hole		Bolt Circle	"B" Dia.
			"H" Diameter	Number		
3-inch, ANSI Class 150	$\frac{24}{0.94}$	$\frac{190.5}{7.50}$	$\frac{19}{0.75}$	4	$\frac{152.4}{6.00}$	$\frac{127}{5.00}$
3-inch, ANSI Class 300	$\frac{28.4}{1.12}$	$\frac{209.6}{8.25}$	$\frac{22.4}{0.88}$	8	$\frac{168.1}{6.62}$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

24244

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

Reference Dimensions:  $\frac{\text{millimeters}}{\text{inches}}$

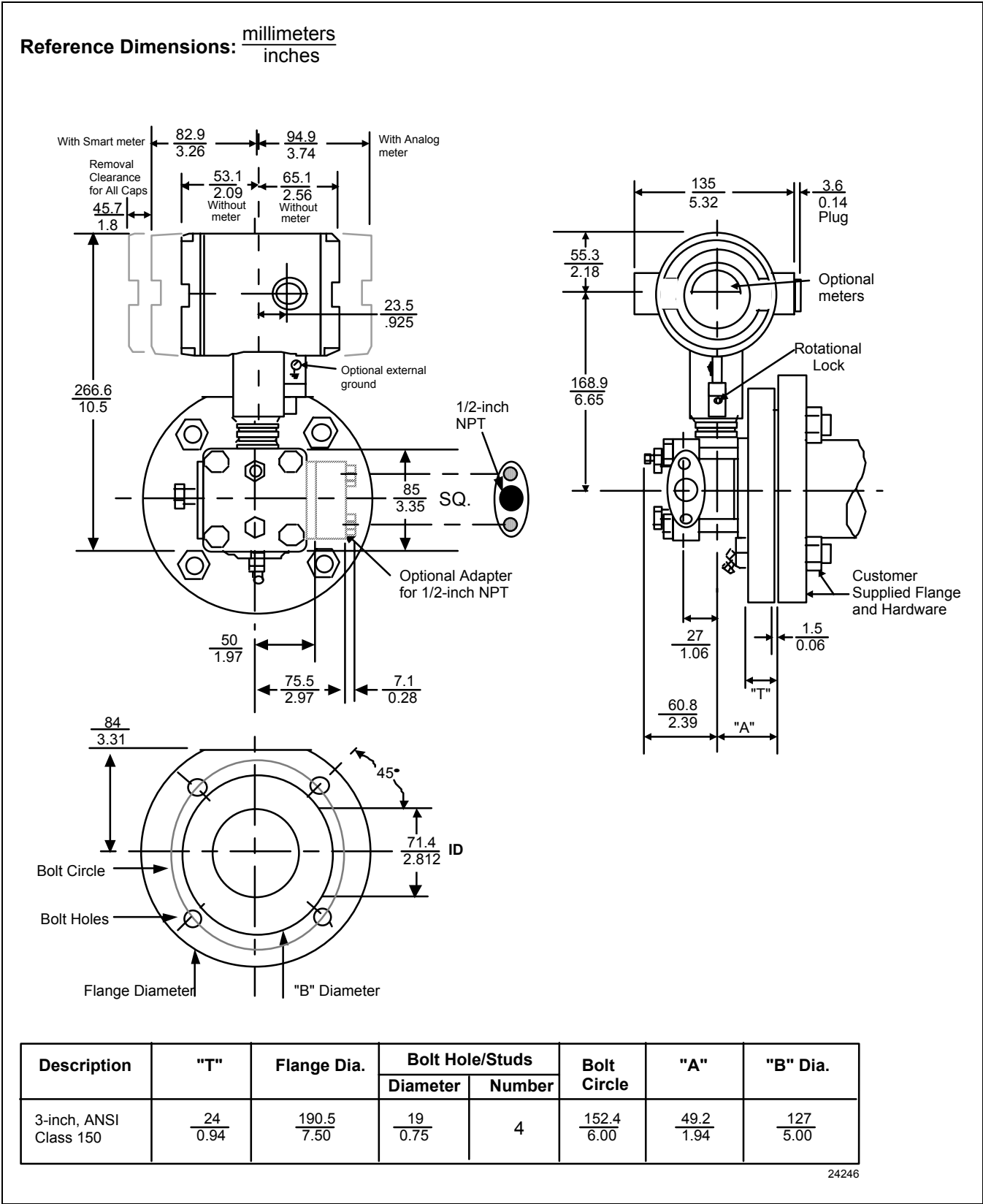


Description	"T"	"D" Flange Dia.	Bolt Hole		Bolt Circle	"A" Dia. (Optional)	"B" Dia.	Extension E		
			"H" Dia.	Number				E 2-inch	E 4-inch	E 6-inch
3-inch, ANSI Class 150	$\frac{24}{0.94}$	$\frac{190.5}{7.50}$	$\frac{19}{0.75}$	4	$\frac{152.4}{6.00}$	N/A	$\frac{127}{5.00}$	$\frac{50.8}{2.00}$	$\frac{101.6}{4.00}$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

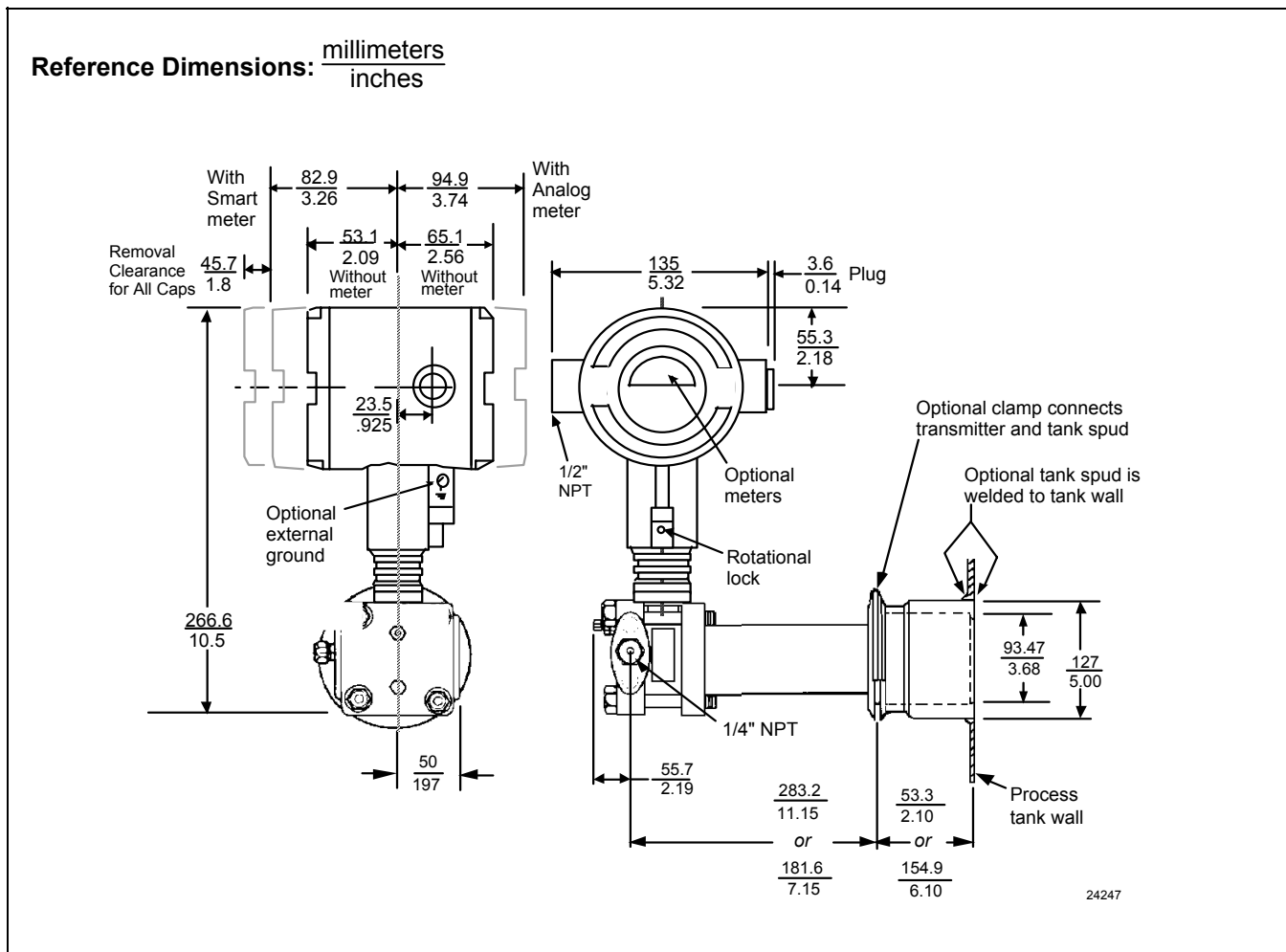
NOTE: See Specification 34-ST-03-26 for Sanitary Flange Mount version.

24245

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



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



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

Options	Ordering Information
<p><b>Mounting Bracket</b> 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.</p> <p><b>Indicating Meter (ME and SM Options)</b> 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.</p> <p><b>Lightning Protection (Option LP)</b> A terminal block is available with circuitry that protects the transmitter from transient surges induced by nearby lightning strikes.</p> <p><b>HART Protocol Compatibility (Option HC)</b> 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.)</p> <p><b>Indicator Configuration (Option CI)</b> Provides custom configuration of Smart Meters.</p> <p><b>Tagging (Option TG)</b> 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.</p> <p><b>Transmitter Configuration (Option TC)</b> 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.</p> <p><b>Custom Calibration and ID in Memory (Option CC)</b> 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.</p> <p><b>FOUNDATION Fieldbus (Option FF)</b> 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.</p>	<p>Contact your nearest Honeywell sales office, or</p> <p>In the U.S.: Honeywell Industrial Automation &amp; Control 16404 North Black Canyon Hwy. Phoenix, AZ 85053 1-800-288-7491</p> <p>In Canada: The Honeywell Centre 155 Gordon Baker Rd. North York, Ontario M2H 3N7 1-800-461-0013</p> <p>In Latin America: Honeywell Inc. 480 Sawgrass Corporate Parkway, Suite 200 Sunrise, FL 33325 (954) 845-2600</p> <p>In Europe and Africa: Honeywell S. A. Avenue du Bourget 1 1140 Brussels, Belgium</p> <p>In Eastern Europe: Honeywell Praha, s.r.o. Budejovicka 1 140 21 Prague 4, Czech Republic</p> <p>In the Middle East: Honeywell Middle East Ltd. Khalifa Street, Sheikh Faisal Building Abu Dhabi, U. A. E.</p> <p>In Asia: Honeywell Asia Pacific Inc. Honeywell Building, 17 Changi Business Park Central 1 Singapore 486073 Republic of Singapore</p> <p>In the Pacific: Honeywell Pty Ltd. 5 Thomas Holt Drive North Ryde NSW Australia 2113 (61 2) 9353 7000</p> <p>In Japan: Honeywell K.K. 14-6 Shibaura 1-chrome Minato-ku, Tokyo, Japan 105-0023</p>
<p>Specifications are subject to change without notice. (Note that specifications may differ slightly for transmitters manufactured before October 30, 1995.)</p>	<p>Or, visit Honeywell on the World Wide Web at: <a href="http://www.honeywell.com">http://www.honeywell.com</a></p>

## 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	Selection	Availability
<b>Span</b>		
0-25 to 0-400 inH <sub>2</sub> O/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 inH <sub>2</sub> O/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 Hast C Hast C	316 SS 316 SS Hast C	N/A	A _ _	♦	
		316 SS		316 LSS Hast C Hast C	316 SS 316 SS Hast C		W _ _	♦	
		Hast C		Hast C	Hast C		B _ _	♦	
							E _ _	♦	
	Extended	Carbon* Steel	316 SS	316 LSS Hast C	316 SS	316 SS	X _ _	♦	
		316 SS		316 LSS Hast C			F _ _	♦	
							J _ _	♦	
	Pseudo Flange	Carbon* Steel	316 SS	316 LSS Hast C	N/A	N/A	M _ _	♦	
		316 SS		316 LSS Hast C			N _ _	♦	
							R _ _	♦	
	Sanitary Flange (3-A)	Carbon* Steel	316 SS	316 LSS Hast C	N/A	N/A	S _ _	♦	
		316 SS		316 LSS Hast C			F _ _	♦	
							Z _ _	w	
Fill Fluid		Silicone					1 _	♦	♦
(Meter Body & Flange)		CTFE					2 _	♦	♦
Process Connection	Reference Head			Flange					
	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 hydrogen migration.  
Use Stainless Steel heads.

\*\* Vent/Drains are Teflon coated for lubricity.

Model Selection Guide, cont.

				STF9	Availability	
					24	2F
				Selection	32	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 3" ANSI Class 150 w/Vent/Drain		316 SS (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	♦	
		316 SS	_ _ 1 _ _	g		
	Flush Design	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.

		Availability	
		STF9	
		24	2F
		32	3F
TABLE III - OPTIONS	Selection		
None	00	•	•
HART ~ Protocol Compatible Electronics	HC	e	e
FOUNDATION Fieldbus Communications	FF	r	r
Analog Meter (0-100 Even 0-10 Square Root)	ME	•	•
Smart Meter	SM	•	•
Custom Configuration of Smart Meter	CI	m	m
Local Zero	LZ	x	x
Local Zero and Span	ZS	s	s
Lightning Protection	LP	•	•
Custom Calibration and I.D. in Memory	CC	•	•
Transmitter Configuration	TC	•	•
Write Protection	WP	•	•
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
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
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	OX	j	j
Over-Pressure Leak Test with F3392 Certificate	TP	•	•
Calibration Test Report and Certificate of Conformance (F3399)	F1	•	•
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	•	•
Additional Warranty - 3 years	W3	•	•
Additional Warranty - 4 years	W4	•	•

Table III continued next page

## Model Selection Guide, cont.

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

\*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	•	•
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## 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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