Honeywell

ST 3000 Smart Transmitter

Release 300 and SFC Smart Field Communicator Model STS 103

Installation Guide

34-ST-33-39

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About This Publication

This manual is intended as a handy guide for installing ST 3000® Release 300 Smart Transmitters. It provides data for checking out, mounting and wiring the transmitter as well as detailed wiring diagrams for reference. Much of this same information is also included in the *ST 3000 Smart Transmitter Release 300 and SFC® Smart Field Communicator Model STS 103 User's Manual 34-ST-25-14* which is the main reference document. We supply this information with each transmitter as an aid in completing installation tasks as quickly as possible.

Procedures in this manual that involve using a **Smart Field Communicator** (**SFC**) to "talk" to the transmitter are based on using our latest SFC Model STS103. You can also use the **Smartline Configuration Toolkit** (**SCT 3000**) software program to perform transmitter configuration and start up. The SCT 3000 contains an on-line user manual and help information that provides details for setting up the transmitter.

If you will be digitally integrating the ST 3000 transmitter with our **TotalPlant**® Solution (TPS) system, you will need to supplement this information with data in the *PM/APM Smartline® Transmitter Integration Manual* which is supplied with the TDC 3000®X bookset. TPS is the evolution of TDC 3000X.

This guide does **not** apply to **Series 100e, non Release 300 Series 100/900** and **Series 600** transmitter models. If you have one of these ST 3000 Smart Transmitter Series, refer to the *Installation Guide* and *User's Manual* supplied with the transmitter for information.

Patent Notice

This product is covered by one or more of the following U.S. Patents: 4,520,488; 4,567,466; 4,494,183; 4,502,335; 4,592,002; 4,553,104; 4,541,282; 4,806,905; 4,797,669; 4,735,090; 4,768,382; 4,787,250; 4,888,992; 5,811,690; 5,875,150; 5,765,436; 4,734,873; 6,041,659 and other patents pending.

References

Publication Title	Publication Number	Binder Title	Binder Number
ST 3000 Smart Transmitter Release 300 and SFC Smart Field Communicator Model STS 103 User's Manual	34-ST-25-14		
SCT 3000 Smartline Configuration Toolkit Start-Up and Installation Manual	34-ST-10-08		
Smart Field Communicator Model STS103 Operating Guide	34-ST-11-14		
For R400 and later:			
PM/APM Smartline Transmitter Integration Manual	PM12-410	Implementation/ PM/APM Optional Devices	TDC 2045

Symbol Definitions

This CAUTION symbol on the equipment refers the user to the Product Manual for additional information. This symbol appears next to required information in the manual.

This WARNING symbol on the equipment refers the user to the Product Manual for additional information. This symbol appears next to required information in the manual.

WARNING: risk of electrical shock. This symbol warns the user of a potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 VDC may be accessible.

ATTENTION, Electrostatic Discharge (ESD) hazards. Observe precautions for handling electrostatic sensitive devices

Protective Earth (PE) terminal. Provided for connection of the protective earth (green or green/yellow) supply system conductor.

Table of Contents

Figures and Tables

Acronyms

AP ..... Absolute Pressure
APM ..... Advanced Process Manager
AWG ..... American Wire Gauge
DE ..... Digital Enhanced Communications Mode
DP ..... Differential Pressure
EMI ..... Electromagnetic Interference
GP ..... Gauge Pressure
HP ..... High Pressure
HP ..... High Pressure Side (DP Transmitter)
inH_2O ..... Inches of Water
KCM ..... Kilo Circular Mils
LGP ..... In-Line Gauge Pressure
LP ..... Low Pressure
LP ..... Low Pressure Side (DP Transmitter)
LRV ..... Lower Range Value
mA ..... Milliamperes
mmHg ..... Millimeters of Mercury
NPT ..... National Pipe Thread
PCB ..... Printed Circuit Board
PM ..... Process Manger
PROM ..... Programmable Read Only Memory
PSI ..... Pounds per Square Inch
PSIA ..... Pounds per Square Inch Absolute
RFI ..... Radio Frequency Interference
SCT ..... Smartline Configuration Toolkit
SFC ..... Smart Field Communicator
URL ..... Upper Range Limit
URV ..... Upper Range Value
Vdc ..... Volts Direct Current
XMTR ..... Transmitter

Technical Assistance

If you encounter a problem with your ST 3000 Smart Transmitter, check to see how your transmitter is currently configured to verify that all selections are consistent with your application.

If the problem persists, you can reach Honeywell's Solution Support Center for technical support by telephone during normal business hours. An engineer will discuss your problem with you. Please have your complete model number, serial number, and software revision number on hand for reference. You can find the model and serial numbers on the transmitter nameplates. You can also view the software version number using the SFC or SCT 3000 software application.

By Telephone

Honeywell Solution Support Center Phone:
1-800-423-9883 (U.S. only)
Outside the U.S. call: **1-602-313-6510**

Additional Help

You may also seek additional help by contacting the Honeywell distributor who supplied your ST 3000 transmitter.

By E-mail

You can also e-mail your technical questions or comments about this product to:
Honeywell Solution Support Center e-mail: **ace@honeywell.com**

Problem Resolution

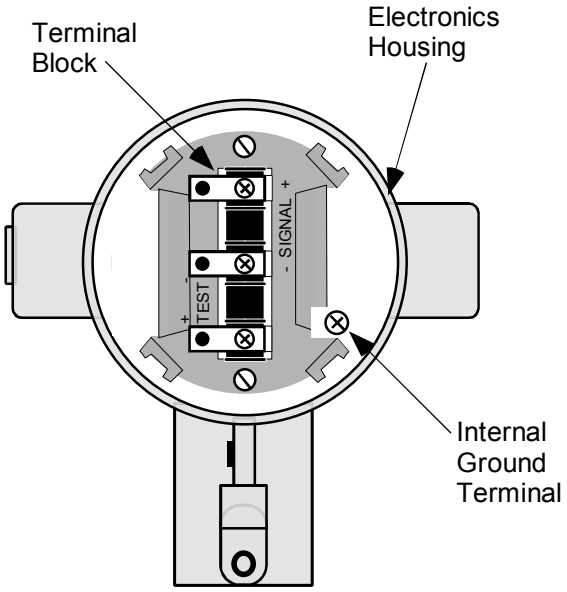
If it is determined that a hardware problem exists, a replacement transmitter or part will be shipped with instructions for returning the defective unit. Please do not return your transmitter without authorization from Honeywell's Solution Support Center or until the replacement has been received.

— IMPORTANT —

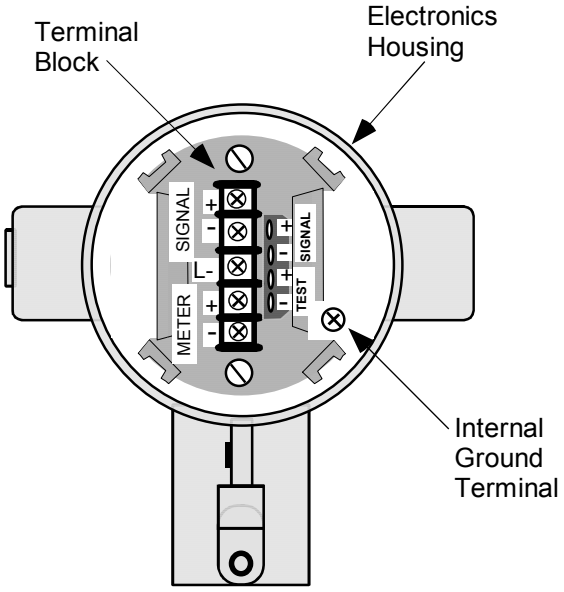
Before You Begin, Please Note

Transmitter Terminal Blocks

Depending on your transmitter options, the transmitter may be equipped with either a 3-screw or 5-screw terminal block inside the electronics housing. This may affect how to connect the loop wiring and meter wiring to the transmitter. See Section 4.3 for the terminal block connections for each type terminal. Section 5 provides additional wiring diagrams showing alternate wiring methods.



3-Screw Terminal Block



5-Screw Terminal Block

Section 1 —Getting Started

1.1 CE Conformity (Europe) Notice

About conformity and special conditions

This product is in conformity with the protection requirements of **89/336/EEC**, the EMC Directive. Conformity of this product with any other "CE Mark" Directive(s) shall not be assumed.

Deviation from the installation conditions specified in this manual, and the following special conditions, may invalidate this product's conformity with the EMC Directive.

- You must use shielded, twisted-pair cable such as Belden 9318 for all signal/power wiring.
- You must connect the shield to ground at the power supply side of the wiring only and leave it insulated at the transmitter side.

ATTENTION

ATTENTION

The emission limits of EN 50081-2 are designed to provide reasonable protection against harmful interference when this equipment is operated in an industrial environment. Operation of this equipment in a residential area may cause harmful interference. This equipment generates, uses, and can radiate radio frequency energy and may cause interference to radio and television reception when the equipment is used closer than 30 meters (98 feet) to the antenna(e). In special cases, when highly susceptible apparatus is used in close proximity, the user may have to employ additional mitigating measures to further reduce the electromagnetic emissions of this equipment.

1.2 Preliminary Checks

Checking ST 3000 shipment

Along with this Installation Guide you should have received

- the ST 3000 Smart Transmitter you ordered, and
- an optional mounting bracket assembly, if applicable.

Before you dispose of the shipping container, be sure you have removed all the contents and visually inspected the transmitter for signs of shipping damage. Report any such damage to the carrier.

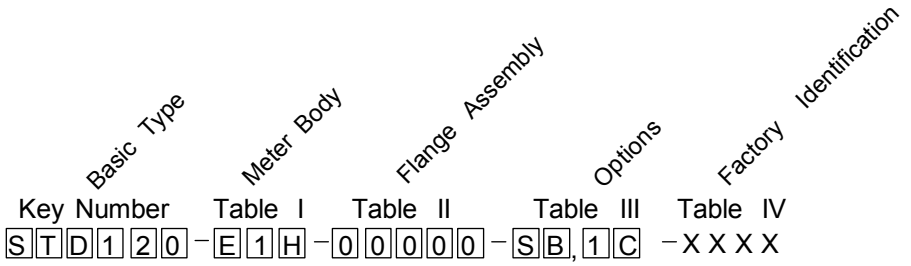
Contact us if there is a problem with the order or an item is missing.

Series and model number data

Honeywell's line of ST 3000 Smart Transmitters includes these two major series designations:

- Series 100
- Series 900

Each series includes several models to meet various process pressure measurement and interface requirements. Each transmitter comes with a nameplate located on the top of the electronics housing that lists its given "model number". The model number format consists of a Key Number with several Table selections as shown below.



You can quickly identify what series and basic type of transmitter you have from the third and fourth digits in the key number. The letter in the third digit represents one of these basic transmitter types:

A = Absolute Pressure

D = Differential Pressure

F = Flange Mounted

G = Gauge Pressure

R = Remote Seals

The number in the fourth digit matches the first digit in the transmitter Series. Thus, a "1" means the transmitter is a Series 100 and a "9" is a Series 900.

Continued on next page

Series and model number data, continued

For a complete breakdown of the table selections in your model number, please refer to the appropriate Specification and Model Selection Guide that is provided as a separate document.

ATTENTION

Previous models of the ST 3000 transmitter with designations of Series 100, Series 100e, Series 600, and Series 900 have been supplied at various times since the ST 3000 was introduced in 1983. While all these transmitters are functionally alike, there are differences in housing and electronics design. This Installation Guide only applies for **Release 300, Series 100 transmitters** with software version 3.0 or greater and **Release 300, Series 900 transmitters** with software version b.0 or greater.

Release 300 transmitters can be identified by the "**R300**" designation on the nameplate.

Earlier Release ST3000 Transmitters

If you have a Series 100e or a Series 900 non-release 300 transmitter, you must refer to the *ST 3000 Smart Transmitter Installation Guide 34-ST-33-31* instead.

Communicating with the ST3000 Transmitter

Communication with your ST 3000 Smart Transmitter can be accomplished by using any of the following interfaces:

- Honeywell's hand-held Smart Field Communicator (SFC).
- Smartline Configuration Toolkit (SCT 3000) that runs on a variety of Personal Computer (PC) platforms.
- Global Universal Station (GUS), if the transmitter is digital integrated with Honeywell's TPS system.

Continued on next page

Communicating with the ST3000 Transmitter, continued

Using the SFC:

If you ordered an SFC along with your transmitter, locate it and follow the instructions supplied with the SFC Model STS103 to prepare it for operation. Otherwise, be sure you have a fully charged SFC Model STS103 on hand to check the operation of your transmitter.

NOTE: SFC model STS103 with software version 5.0 or greater is fully compatible with all Series 100 and 900, Release 300, ST 3000 transmitters and smart meters. The SFC will operate with transmitters that have older software versions, but functions will be limited to those applicable for the transmitter software.

If your SFC is a Model STS102 instead, you must refer to the *ST 3000 Smart Field Communicator for Series 3000 Transmitters Operating Guide 34-ST-11-10* for keystroke details.

Using the SCT:

The SCT 3000 Smartline Configuration Toolkit runs on a variety of PC platforms using MS-DOS 5.0 or higher and Windows 95©, Windows 98 and Windows NT 4.0. It is a bundled Microsoft Windows software and PC-interface hardware solution that allows quick, error-free configuration of Honeywell Smartline field instruments.

NOTE: SCT 3000 software Release 3.12.2 or greater is compatible with all Series 100 and 900, Release 300, ST 3000 transmitters. Please contact your Honeywell representative for more information.

Using reference data

The *ST 3000 Smart Transmitter Release 300 and SFC Smart Field Communicator Model STS 103 User's Manual, 34-ST -25-14* was shipped separately to a person designated on the order. The User's Manual contains complete configuration, operation, calibration, service, and replacement parts information for the transmitter, so you may want to have it on hand for reference. It also includes the same installation data contained in this installation guide to minimize cross reference. But, the optional bench check function and reference dimension drawings list are included in this guide only.

Appendix A —Smart Meter Reference contains configuration and operating information for using the the ST 3000 when it is equipped with the smart meter option (option SM).

Section 2 —Optional Bench Check

2.1 Connecting Power and SCT/SFC

About the bench check

The bench check is an optional procedure for checking your transmitter before you install it by:

- Connecting a power source and an SFC (or a PC running SCT 3000 software) to the transmitter
- Running a communication test with an SFC (or SCT 3000)
- Checking the operation status and checking the configuration database

Also, if your transmitter was not configured at the factory, you can do so during this procedure. See the Configuration section in the *ST 3000 Smart Transmitter, Release 300 and SFC Smart Field Communicator Model STS 103 User's Manual 34-ST-25-14* for details.

When using the SCT 3000, configuration instructions and device templates are provided on-line to aid in configuring your transmitter.

Factory Calibration

Each ST 3000 Transmitter is factory calibrated before shipment.

- First a full range calibration is performed.
- Next, a turndown calibration is done which is typically between 25% to 50% of its full range.
- Then it is calibrated to a range specified by your purchase order. This means there is no need to calibrate the transmitter during installation. (If no range is specified, the transmitter is calibrated to the turndown factory default.)
- If you need any calibration information, see the appropriate section in the *ST 3000 Smart Transmitter, Release 300 and SFC Smart Field Communicator Model STS 103 User's Manual*.
- If you have a transmitter with optional local zero and span adjustments, you may just want to go to Appendix A for the local zero and span adjustments procedure.

Procedure

Use the procedure in Table 1 to connect a power supply and an SFC Model STS103 to your transmitter on a bench. See Figure 1 for reference.

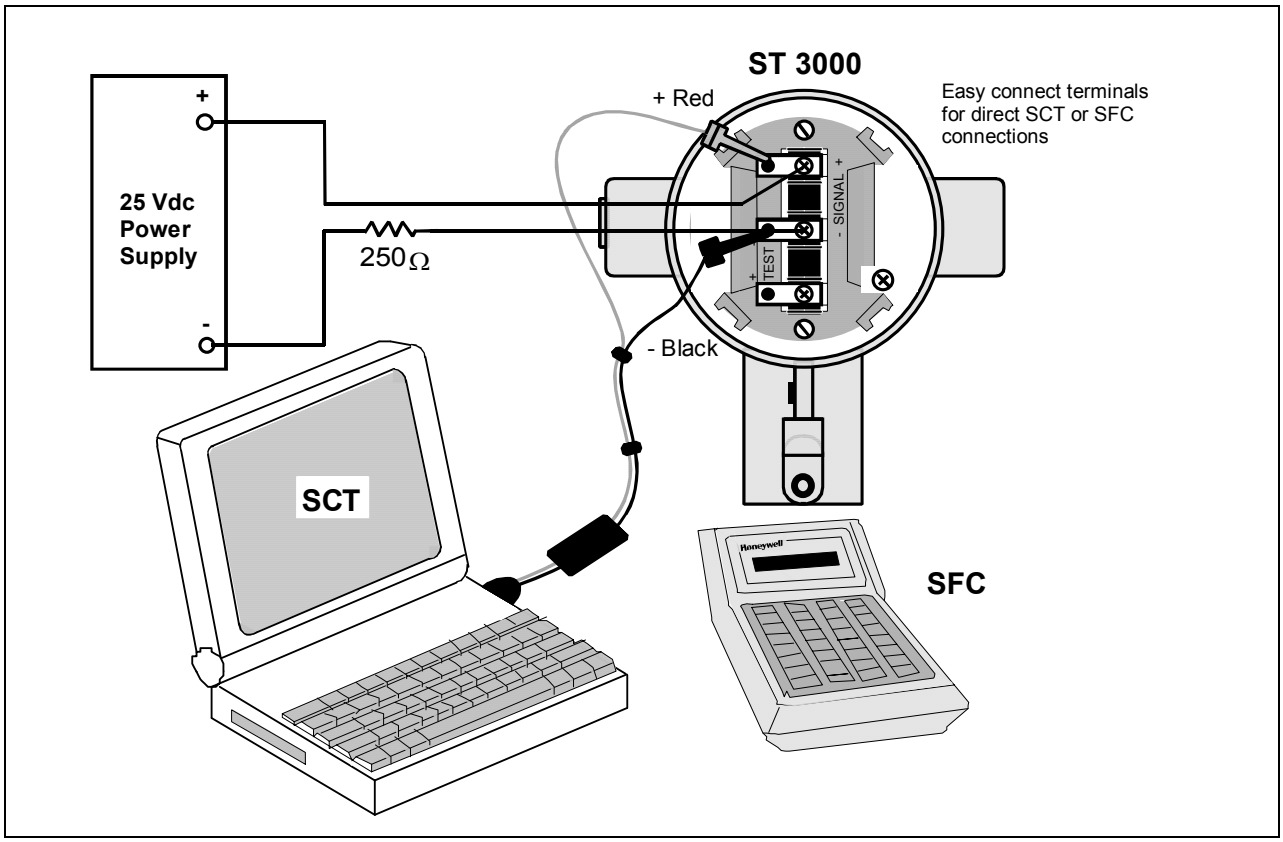
Continued on next page

CAUTION Do not try to remove the transmitter housing end-cap before loosening the end-cap lock on the transmitter housing.

Table 1 Connecting Power Supply and SFC to ST 3000

Step	Action
1	Use a 1.5 mm allen wrench to loosen the end-cap lock on the terminal side of the transmitter housing. Unscrew and remove the end cap from the housing
2	If the transmitter is supplied with an optional integral analog meter, unsnap the meter from the terminal block to expose the wiring connections.
3	Observing polarity, connect a 25 Vdc power supply to the transmitter's SIGNAL terminals as shown in Figure 1. **ATTENTION** Be sure there is a minimum of 250 ohms resistance between the power supply and the transmitter.
4	Connect the SCT or SFC to the transmitter - red lead to SIGNAL positive and black lead to SIGNAL negative. See Figure 1.
5	• If you are using the SCT, Select Tag ID icon from the SCT toolbar to establish on-line commnications with the transmitter. • If you are using the SFC, go to Section 2.2.

Figure 1 Typical Power Supply and SCT/SFC Connections to ST 3000.



2.2 Testing Communications

Background

Once you connect power and the SCT or SFC to the transmitter, you are ready to test communications with the transmitter.

Procedure

The procedure in Table 2 outlines the steps using an SFC for initiating communications with an ST 3000 transmitter without an assigned tag number.

Table 2 Testing Communications with Transmitter.

Step	Press Key	Read Display or Action	Description
1		Slide power switch on left side of SFC to ON position.	SFC runs its self check and displays initial prompt.
2		PUT LOOP IN MAN **OR** DE-XMTR PRESS ID	If this prompt appears, transmitter is in Analog mode of operation. This is the factory default mode of operation setting. Put your control loop in the manual mode of operation before initiating SFC communications. Note that you must do this separately through the receiving device in the loop. If this prompt appears, transmitter is in Digital (DE) mode of operation.
3	DE READ A ID	TAG NO. TRIPS SECURED?? **OR** Go to Step 5	Be sure any switches that may trip alarms or interlocks associated with analog loop are secured or turned off. Go to Step 4. This prompt does not appear for transmitters operating in DE mode. See DE transmitter display response in Step 5.
4	NON-VOL ENTER (Yes)	Confirms that “TRIPS” are secured. Go to Step 5 for display response.	Required for transmitters operating in analog mode only.

Continued on next page

Procedure, continued

Table 2 Testing Communications with Transmitter, Continued

Step	Press Key	Read Display or Action	Description
5		TAG NO. SFC WORKING...	Message exchange is taking place Note that communications with transmitter are blocked until [**ID**] key is pressed
		LIN DP TAG NO. _	Transmitter is in analog transmission mode. "LIN" means transmitter is set for linear output instead of square root (SQRT). "DP" means transmitter is differential pressure type instead of gauge pressure (GP) or absolute pressure (AP). Last eight columns in bottom row are blank when no tag number has been assigned to this transmitter. Go to Step 8.
		OR	
		DE–XMTR TAG NO. _	Transmitter is in digital (DE) transmission mode. Last eight columns in bottom row are blank when no tag number has been assigned to this transmitter. Go to Step 7.
		OR	
		TAG NO. NO XMTR RESPONSE	Communication error messages are cycled at two second intervals and display returns to initial prompt. Go to Step 6.
6		There is a communication problem, check the • power and SFC connections - Is the polarity correct; red to positive and black to negative? • loop resistance - Is there a minimum of 250 ohms resistance between the SFC and the power supply? • power supply - Is power applied, is there greater than 11 volts at the transmitter, and are you within the operating area on the curve in Figure 13?	Correct any wiring, resistance, or power supply problems, and try communicating again - Press [**ID**] key. If you are still not getting the correct display, note error messages and refer to Troubleshooting section in the transmitter's *User's Manual 34-ST-25-14* for probable cause.

Continued on next page

Procedure, continued

Table 2 Testing Communications with Transmitter, Continued

Step	Press Key	Read Display or Action	Description
7	^ SHIFT DE READ A ID	DE–XMTR TAG NO. SHIFT– TAG NO. SFC WORKING–.33% LIN DP TAG NO. –	Initiates shift key selection. Begins upload of configuration database from transmitter. Operation completion rate is shown in percent. Note that display for ID response reverts to style used for transmitter in analog mode when upload is completed.
8	F/S DIR U STAT	STATUS SFC WORKING... STATUS STATUS CHECK=OK LIN DP READY...	Initiates status check. If messages other than this one are cycled in display, refer to the Troubleshooting section in this manual for an explanation of the message, the probable cause, and any corrective action. Signals end of status messages for display. **ATTENTION** When assigned, the transmitter's tag number also appears in the top row of the display.
9		You have established communications with transmitter and are ready to initiate other SFC operations. Go to Section 2.3.	**ATTENTION** If you want to change the transmitter's communication mode from Analog (A) to digital (DE), see the Changing Mode of Operation section in the transmitter's *User's Manual 34-ST-25-14* for details.

2.3 Verifying Configuration Data

Procedure

Use the procedure in Table 3 to display all the basic transmitter database parameters to be sure they are correct. Note that the values/selections shown in displays are for example purposes only.

ATTENTION

- This procedure assumes that you have established communications with the transmitter as outlined in Table 2.
- If any parameter is not set to the correct value/selection or your transmitter was not configured, you can do so now. Refer to the Configuration Section in the *ST 3000 Smart Transmitter, Release 300 and SFC Smart Field Communicator Model STS 103 User's Manual, 34-ST-25-14* for details.

Table 3 Verifying Transmitter's Configuration Data (Using the SFC)

Step	Press Key	Read Display or Action	Description
1	DE READ A ID NON-VOL ENTER (Yes)	TAG NO. TRIPS SECURED??	This prompt only appears for transmitters in analog mode.
		TAG NO. SFC WORKING...	This is only required for transmitters in analog mode.
		LIN DP TAG NO. SPT 1001	Transmitter's assigned tag number "SPT 1001" appears in bottom row.
2	C DAMP	DAMP 1 SPT 1001 Ø.3 SECONDS	Present damping time setting.

Continued on next page

Procedure, continued

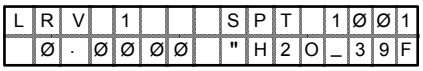
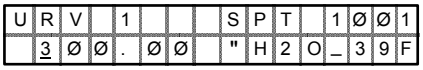
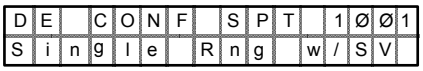
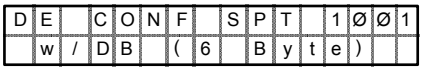
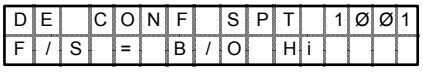
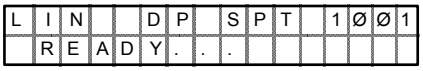
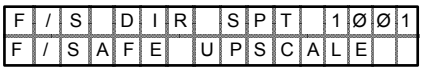
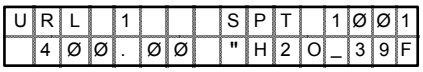
Table 3 Verifying Transmitter's Configuration Data, Continued

Step	Press Key	Read Display or Action	Description
3	B CONF	ST CONFIG CONFORMITY?	Access configuration menu.
	NON-VOL ENTER (Yes)	CONFORMITY LINEAR	Present output conformity is linear
	CLR (No)	ST CONFIG CONFORMITY?	Exit menu selection.
	H ▲ NEXT	ST CONFIG Meter Config?	Call up next menu selection.
	NON-VOL ENTER (Yes)	Meter Config SFC WORKING...	Enters meter configuration function and confirms that local smart meter is present. Timed prompt - See next display.
		Meter Config Meter Bd Present	**ATTENTION** If prompt "No Meter Present" appears, prompt times out in a few seconds, as described above, and calls up the "Configure Meter?" prompt. This means that you can access the meter configuration function without the local smart meter installed. If prompt "Mtr not Supportd" appears, prompt times out and returns to previous ST CONFIG prompt. This means that you are working with a pre-release 300 transmitter that does not support the local smart meter option and, therefore, can not access the meter configuration function.
		Meter Config Configure Meter?	Prompt asks if you want to configure smart meter.
	NON-VOL ENTER (YES)	Meter Eng Units "H2O_39F	Calls up present meter Engineering Unit selection.
	CLR (No)	ST CONFIG Meter Config?	Exit menu selection.
4	D UNITS	UNITS 1 SPT 1Ø Ø1 "H2O_39F	SFC will display range values in inches of water @ 39º F (4º C).

Continued on next page

Procedure, continued

Table 3 Verifying Transmitter's Configuration Data, Continued

Step	Press Key	Read Display or Action	Description
5	E LRV 0%		Present Lower Range Value setting.
6	F URV 100%		Present Upper Range Value setting.
7	^ SHIFT		Initiate shift key selection.
	DE CONF I MENU ITEM		Access DE configuration menu. These parameters apply for transmitters in DE mode only.
			Present output mode setting for transmitter in DE mode.
	H ▲ NEXT		Present broadcast format setting for transmitter in DE mode.
	H ▲ NEXT		Present failsafe mode setting for transmitter in DE mode.
	CLR (No)		Exit DE configuration menu.
8	^ SHIFT		Initiate shift key selection.
	F/S DIR U STAT		Default failsafe direction for analog output. This applies for transmitter in analog mode only.
9	^ SHIFT		Initiate shift key selection.
	URL Y SPAN		Factory set Upper Range Limit. This can not be changed.
10		Turn off power and SFC. Remove power leads and SFC leads from transmitter. Replace integral meter, if applicable; replace end-cap; and tighten end-cap lock	This completes bench check unless you want to change default failsafe direction for analog output and/or position of optional write protect jumper. If you do want to change failsafe direction or write protect jumper, go to Section 2.4 or 2.5, respectively. Otherwise, you can now install transmitter.

2.4 Changing Default Failsafe Direction

Background

Transmitters are shipped with a default failsafe direction of upscale. This means that the transmitter's output will be driven upscale (maximum output) when the transmitter detects a critical status.

You can change the direction from upscale to downscale (minimum output) by cutting jumper W1 on the printed wiring assembly (PWA).

Analog and DE mode differences

If your transmitter is operating in the analog mode, an upscale failsafe action will drive the transmitter's output to greater than 21 mA or a downscale action will drive its output to less than 3.8 mA.

If your transmitter is operating in the DE mode, an upscale failsafe action will cause the transmitter to generate a "+ infinity" digital signal, or a downscale failsafe action will cause it to generate a "– infinity" digital signal. The STIMV IOP module interprets either signal as "not a number" and initiates its own configured failsafe action for the control system. The STDC card initiates the failsafe mode configured through the transmitter when either signal is generated.

ATTENTION

The failsafe direction display that you can access through the SFC only shows the state of the failsafe jumper in the transmitter as it correlates to analog transmitter operation. The failsafe action of the digital control system may be configured to operate differently than indicated by the state of the jumper in the transmitter.

Procedure

The procedure in Table 4 outlines the steps for cutting the failsafe jumper on the transmitter's PWA. Figure 2 shows the location of the failsafe jumper on the PWA for Release 300 transmitters.

The nature of the integrated circuitry used in the transmitter's PWA makes it susceptible to damage by stray static discharges when it is removed from the transmitter. Follow these tips to minimize chances of static electricity damage when handling the PWA.

- Never touch terminals, connectors, component leads, or circuits when handling the PWA.
- When removing or installing the PWA, hold it by its edges or bracket section only. If you must touch the PWA circuits, be sure you are grounded by staying in contact with a grounded surface or wearing a grounded wrist strap.
- As soon as the PWA is removed from the transmitter, put it in an electrically conductive bag or wrap it in aluminum foil to protect it.

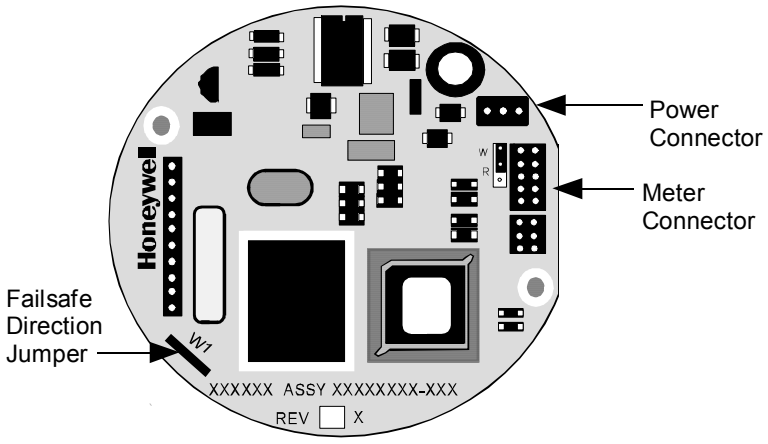
Continued on next page

Procedure, continued

Table 4 Cutting Failsafe Direction Jumper

Step	Action
1	With transmitter on bench and no power applied. Loosen end-cap lock and unscrew end cap from electronics side of transmitter housing.
2	• If applicable, unsnap Local Smart Meter from PWA mounting bracket and unplug cable from connector on back of meter assembly. • Loosen two retaining screws and carefully pull mounting bracket and PWA from housing. • Using retaining clip remove flex-tape connector from PWA. • Remove 2-wire power connector from PWA, and then remove PWA and mounting bracket assembly.
3	With component side of PWA facing you, locate failsafe jumper W1 and cut it in half with small wire cutter such as dykes. See Figure 2. This changes failsafe action from upscale to downscale.
4	Reverse applicable previous steps to replace PWA.
6	Turn ON transmitter power.

Figure 2 Location of Failsafe Direction Jumper on PWA.



2.5 Optional Write Protect Jumper

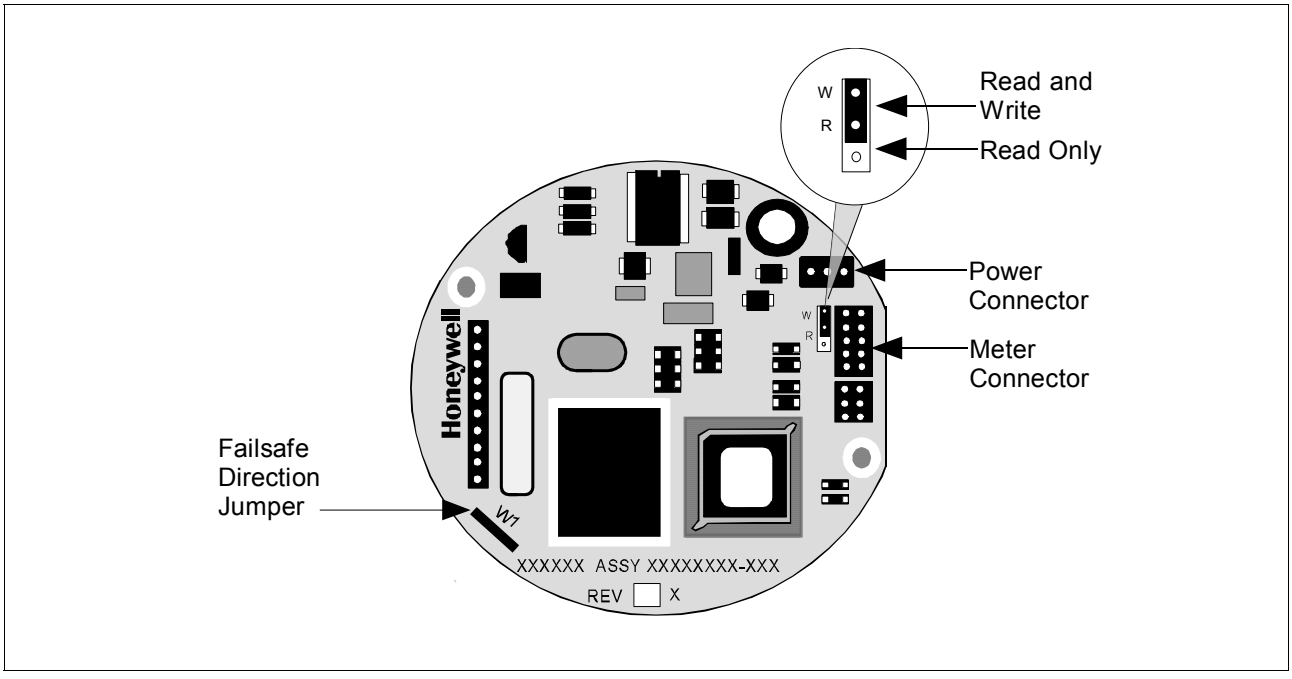
Write protect option

The ST 3000 transmitters are available with a “write protect option”. It consists of a jumper located on the transmitter’s PWA that you can position to allow read and write access or read only access to the transmitter’s configuration database. When the jumper is in the read only position, you can only read/view the transmitter’s configuration and calibration data. Note that the factory default jumper position is for read and write access.

There is no need to check the jumper position unless you want to change it. Refer to the steps in Table 4 to remove the PWA from the transmitter and Figure 3 to reposition the jumper.

Figure 3 shows the location of the write protect jumper on the PWA for Release 300 transmitters.

Figure 3 Write Protect Jumper Location and Selections.



2.6 Setting Range Values Using Local Adjustments

Local zero and span option

For transmitter applications that do not require an SFC nor digital integration with Honeywell's TPS systems, ST 3000 transmitters are available with optional local zero and span adjustments.

About local adjustments

The transmitter's range values can be set by using the pushbuttons on the face of the local zero and span option or smart meter. Refer to the procedure for setting the range values to applied pressures using local zero and span adjustments in *Appendix A —Smart Meter Reference* in this guide.

Section 3 —Preinstallation Considerations

3.1 Considerations for ST 3000 Transmitter

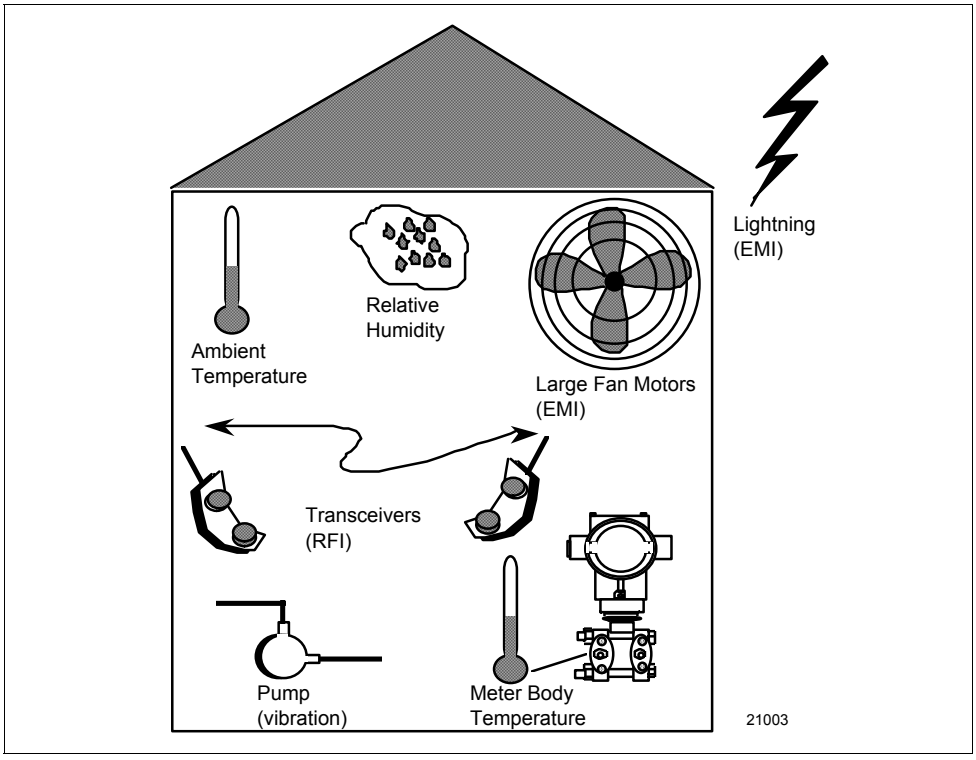
Evaluate conditions

The ST 3000 transmitter is designed to operate in common indoor industrial environments as well as outdoors. To assure optimum performance, evaluate these conditions at the mounting area relative to published transmitter specifications and accepted installation practices for electronic pressure transmitters.

- Environmental Conditions
  - Ambient Temperature
  - Relative Humidity
- Potential Noise Sources
  - Radio Frequency Interference (RFI)
  - Electromagnetic Interference (EMI)
- Vibration Sources
  - Pumps
  - Motorized Valves
  - Valve Cavitation
- Process Characteristics
  - Temperature
  - Maximum Pressure Rating

Figure 4 illustrates typical mounting area considerations to make before installing a transmitter.

Figure 4 Typical Mounting Area Considerations Prior to Installation



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Temperature limits

Table 5 lists the operating temperature limits for the various types of transmitters with silicone fill fluids. See transmitter specifications for temperature limits of transmitter with alternative fill fluids.

Table 5 Operating Temperature Limits (Transmitters with Silicone Fill Fluids)

Transmitter Type and Model	Ambient Temperature		Process Interface Temperature	
	°C	°F	°C	°F
Draft Range STD110	-40 to 70	-40 to 158	-40 to 70	-40 to 158
Differential Pressure STD125	-40 to 85	-40 to 185	-40 to 85	-40 to 185
STD120, STD130, STD170	-40 to 93	-40 to 200	-40 to 125	-40 to 257
STD904, STD924, STD930, STD974	-40 to 85	-40 to 185	-40 to 125	-40 to 257
Gauge Pressure				
STG140, STG170, STG180, STG14L, STG17L, STG18L	-40 to 93	-40 to 200	-40 to 125	-40 to 257
STG14T	-40 to 93	-40 to 200	-40 to 150 †	-40 to 302 †
STG93P	-15 to 65	5 to 149	-15 to 95 ††	5 to 203 ††
STG944, STG974	-40 to 85	-40 to 185	-40 to 125	-40 to 257
STG90L, STG94L, STG97L, STG98L	-40 to 85	-40 to 185	-40 to 110	-40 to 230
Absolute Pressure STA122	-40 to 93	-40 to 200	See Specification Sheet	
STA140	-40 to 93	-40 to 200	-40 to 80	-40 to 176
STA922	-40 to 85	-40 to 185	See Specification Sheet	
STA940	-40 to 85	-40 to 185	-40 to 80	-40 to 176
Flange Mounted STF128, STF132, STF924, STF932	-40 to 93	-40 to 200	-40 to 175	-40 to 350
Pseudo-Flanged Head				
STF12F, STF13F, STF92F, STF93F	-40 to 93	-40 to 200	-40 to 93	-40 to 200
STF14F	-40 to 85	-40 to 185	-40 to 85	-40 to 185
Gauge Pressure Flange Mount				
STF14T	-40 to 93	-40 to 200	-40 to 150 †	-40 to 302 †
Remote Diaphragm Seals				
STR12D, STR13D, STR14G, STR17G, STR14A	See Specification Sheet		See Specification Sheet	
STR93D, STR94G	-40 to 85	-40 to 185	See Specification Sheet	

† Process temperatures above 125 °C (257 °F) require a reduction in the maximum ambient temperature as follows:

Process Temperature	Ambient Temperature Limit
150 °C (302 °F)	50 °C (122 °F)
140 °C (284 °F)	60 °C (140 °F)
125 °C (257 °F)	85 °C (185 °F)

†† Process temperatures above 65 °C (149 °F) require a 1:1 reduction in maximum ambient temperature.

NOTE: For transmitters with local meter option see Table A-2.

NOTE: Transmitters with other fill fluids (CTFE, Neobee, Etc.) have different Operating Temperature Limits. For more specific information, refer to the appropriate Specification and Model Selection Guide or transmitter nameplate

Pressure ratings

Table 6 lists maximum working pressure for a given transmitter Upper Range Limit (URL).

The maximum allowable working pressure (MAWP) is the pressure used for the approval body safety calculations.

Table 6 Transmitter Maximum Allowable Working Pressure (MAWP) Ratings

Transmitter Type	Upper Range Limit (URL)	MAWP
Draft Range	10 inches H_2O (25 mbar)	50 psi (3.5 bar)
Differential Pressure	400 inches H_2O (1 bar)	3000 psi (210 bar)
	100 psi (7 bar)	3000 psi (210 bar)
	3000 psi (210 bar)	3000 psi (210 bar)
Gauge Pressure	100 psi (7 bar)	100 psi (7 bar)
	300 psi (21 bar)	300 psi (21 bar)
	500 psi (35 bar)	500 psi (35 bar)
	3000 psi (210 bar)	3000 psi (210 bar)
	6000 psi (415 bar)	6000 psi (415 bar)
	10000 psi (690 bar)	10000 psi (690 bar)
Flange Mount	400 inches H2O (1 bar)	Per selected flange and material (ANSI/ASME 150#, 300#, DN PN40)
	100 psi (7 bar)	
Remote Seal	400 inches H2O (1 bar)	Lesser MAWP of either Remote Seal selected or transmitter pressure rating
	100 psi (7 bar)	
Absolute Pressure	780 mmHg Absolute (1 bar)	780 mmHg Absolute (1 bar)
	500 psia (35 bar)	500 psia (35 bar)

Note: Maximum Allowable Working Pressure (MAWP) may vary with materials of construction and process temperature. For more specific information, refer to the appropriate Specification and Model Selection Guide or transmitter nameplate

Note: To convert bar values to kilopascals (kPa), multiply by 100.
For example, 3.5 bar equals 350 kPa.

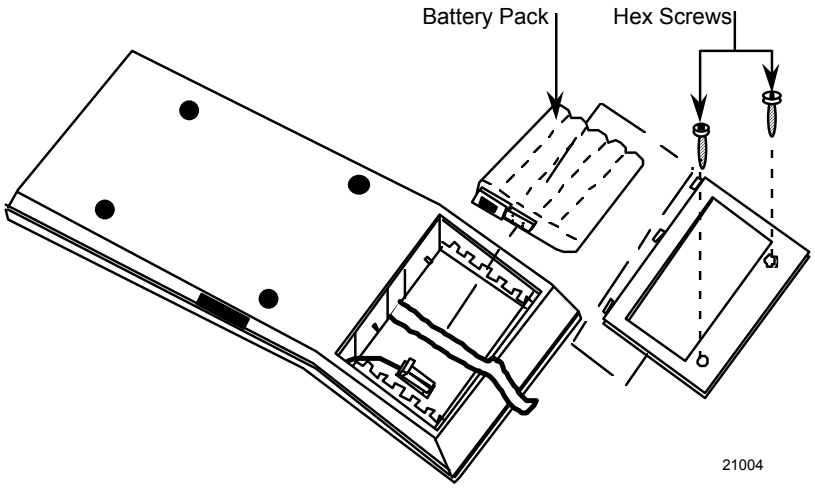
3.2 Considerations for SFC/SCT

Install SFC battery pack

If the SFC battery pack was removed for shipping and/or storage, you will have to install the battery pack and charge the batteries before you can operate the SFC.

The procedure in Table 7 outlines the steps for the battery pack.

Table 7 Installing and Charging SFC Battery Pack

Step	Action
1	Turn SFC face down on working surface. Use metric hex wrench (2.5 mm) to remove screws in battery compartment cover and remove cover.
2	Insert battery pack in compartment and connect plug in compartment to pin on battery back Example - Battery pack installation. 
3	Replace cover and tighten hex screws
4	Connect lead from battery charger to recessed connector on left side of SFC. **WARNING** The SFC battery charger is not intrinsically safe. Always recharge the SFC battery pack in a nonhazardous location. The SFC itself is an intrinsically safe device.

Continued on next page

Install SFC battery pack, continued

Table 7 Installing and Charging SFC Battery Pack, Continued

Step	Action
5	Plug battery charger into any standard 120 Vac outlet or universal-European 240 Vac outlet as applicable for charger power rating. If 240 Vac charger is supplied with stripped leads instead of universal-European plug, lead identification for 240 Vac charger is as follows.

Lead Color…	Function…
Blue	Neutral
Brown	Hot
Green/Yellow	Ground

ATTENTION It takes up to 16 hours to fully recharge the battery pack and you can use the SFC continuously for up to 24 hours before the battery pack needs recharging.

Temperature Limits

The ambient operating temperature limits for the SFC are -10 to 50 °C (14 to 122 °F) with relative humidity in the range of 10 to 90% RH.

Usage guidelines

- For transmitters operating in the Analog mode, be sure to put an analog control loop into its manual mode before initiating SFC communications with the transmitter. Also, be sure any switches that may trip alarms or interlocks associated with the analog loop are secured or turned OFF. Communication superimposes digital signals on the loop wiring that could affect the analog control signal.
- Be sure the power supply voltage does not exceed 45Vdc. The ST 3000 transmitter and SFC were designed to operate with voltages below 45Vdc.
- Be sure there is at least 250 ohms of resistance between the SFC and the power supply for proper communications.

SCT 3000 Requirements

The Smartline Configuration Toolkit (SCT 3000) consists of the software program which is contained on diskettes and a Smartline Option Module which is the hardware interface used for connecting the host computer to the ST 3000 transmitter.

Be certain that the host computer is loaded with the proper operating system necessary to run the SCT program. See the *SCT 3000 Smartline Configuration Toolkit Start-up and Installation Manual 34-ST-10-08* for complete details on the host computer specifications and requirements for using the SCT 3000.

3.3 Considerations for Local Smart Meter Option

Smart meter reference specifications

If your ST 300 transmitter is equipped with a Local Smart Meter option, you may want refer to the design and operating specifications for this option. See *Appendix A —Smart Meter Reference* in the back of this guide.

Section 4 —Installation

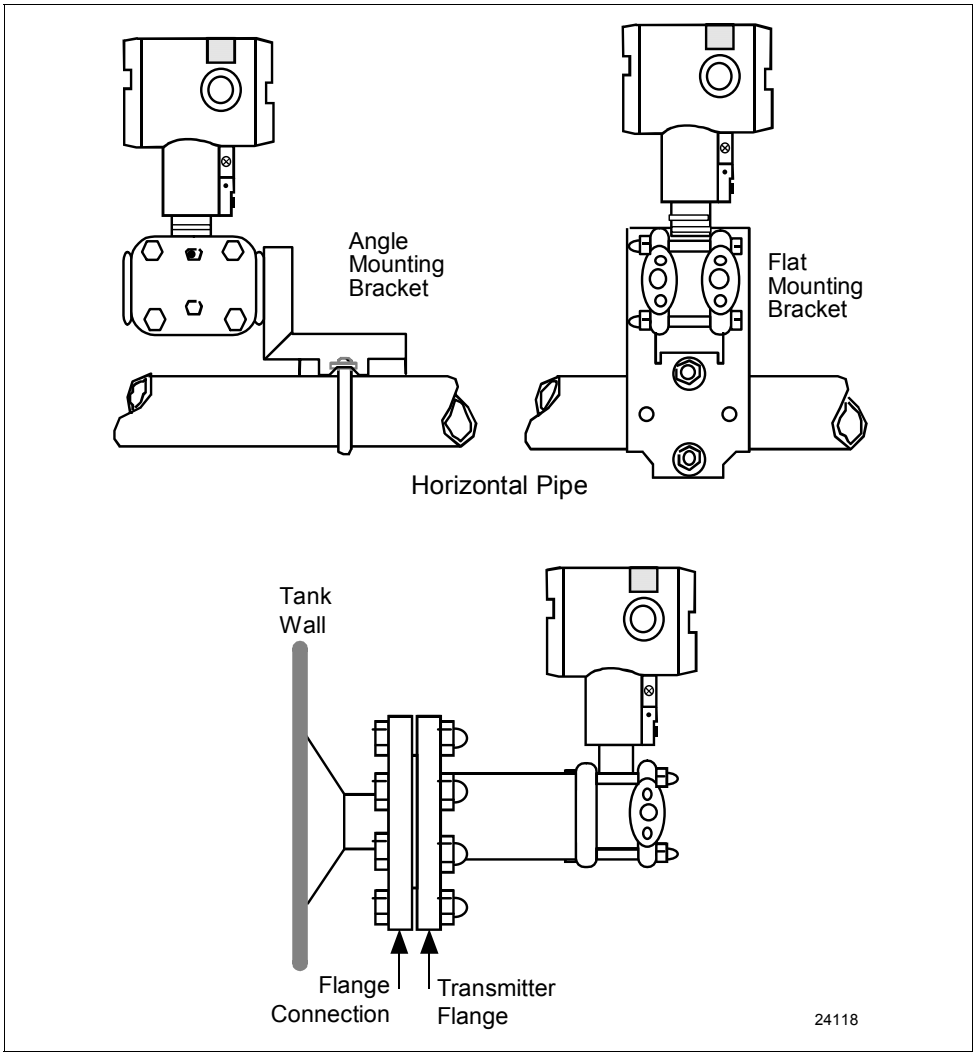
4.1 Mounting ST 3000 Transmitter

Summary

You can mount all transmitter models (except flush mount models and those with integral flanges) to a 2-inch (50 millimeter) vertical or horizontal pipe using our optional angle or flat mounting bracket, or a bracket of your own. Flush mount models are mounted directly to the process pipe or tank by a 1-inch weld nipple. Those models with integral flanges are supported by the flange connection.

Figure 5 shows typical bracket mounted and flange mounted transmitter installations for comparison.

Figure 5 Typical Bracket Mounted and Flange Mounted Installations



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Dimensions

Detailed dimension drawings for given transmitter series and types are listed in Section 5 for reference. Note that abbreviated overall dimensions are also shown in the specification sheets for the given transmitter models.

This section assumes that the mounting dimensions have already been taken into account and the mounting area can accommodate the transmitter.

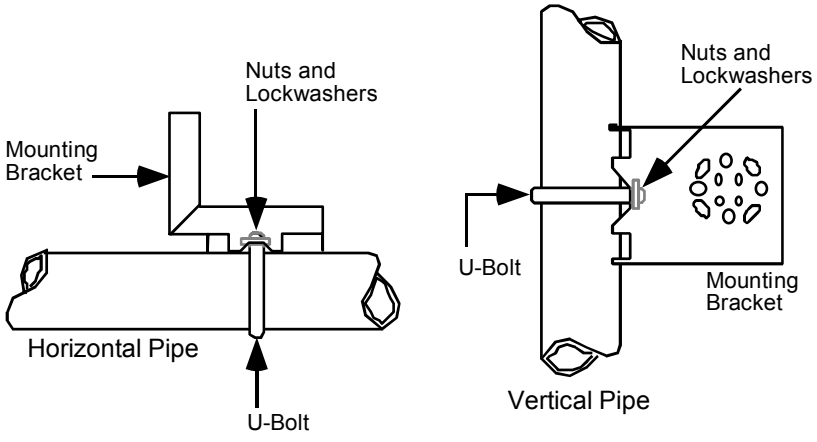
Bracket mounting

Table 8 summarizes typical steps for mounting a transmitter to a bracket.

Table 8 Mounting ST 3000 Transmitter to a Bracket

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>
<table>
<tr><th>If you are using an…</th><th>Then…</th></tr>
<tr><td>optional mounting bracket</td><td>go to Step 2.</td></tr>
<tr><td>existing mounting bracket</td><td>go to Step 3.</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Position bracket on 2-inch (50.8 mm) or, and install “U” bolt around pipe and through holes in bracket. Secure with nuts and lockwashers provided.

Example - Angle mounting bracket secured to horizontal or vertical pipe.

 
</td></tr>
</table>

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Bracket mounting, continued

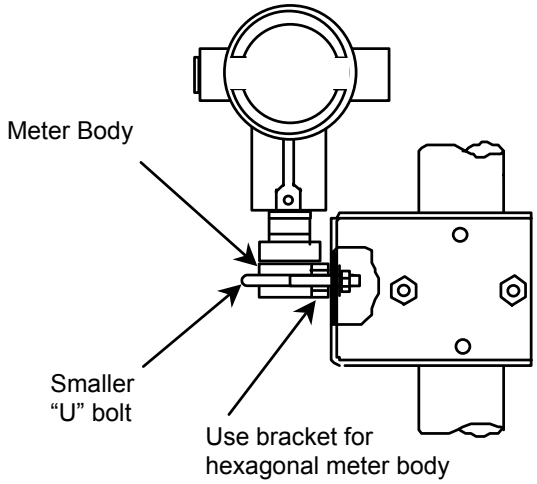
Table 8 Mounting ST 3000 Transmitter to a Bracket, continued

Step	Action
3	Align appropriate mounting holes in transmitter with holes in bracket and secure with bolts and washers provided.

If transmitter is …	Then …
DP type with double-ended process heads and/or remote seals	use alternate mounting holes in end of heads.
GP and AP with single-ended head	use mounting holes in side of meter body.
In-line GP (LGP model)	use smaller “U” bolt provided to attach meter body to bracket. See figure below.
Dual head GP and AP	use mounting holes in end of process head.

Example – LGP model transmitter mounted to optional angle mounting bracket.

LGP Models

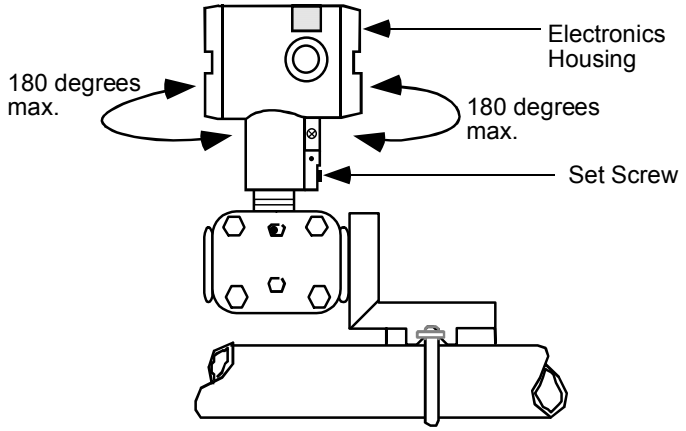


NOTE: If the meter body is hexagonal, you must use the additional bracket supplied. If meter body is round, discard the bracket.

Continued on next page

Bracket mounting, continued

Table 8 Mounting ST 3000 Transmitter to a Bracket, continued

Step	Action
4	Loosen set screw on outside neck of transmitter one full turn. Rotate Transmitter housing in maximum of 180 degree increment in left or right direction from center to position you require and tighten set screw (1.46 to 1.68 Nùm/13 to 15 lb-in). Example - Rotating Transmitter housing.  **ATTENTION** The metric socket head wrench kit supplied with the SFC includes 2.5, 3, and 4mm size wrenches. You will need the 4mm size wrench for the outside set screw.

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ATTENTION

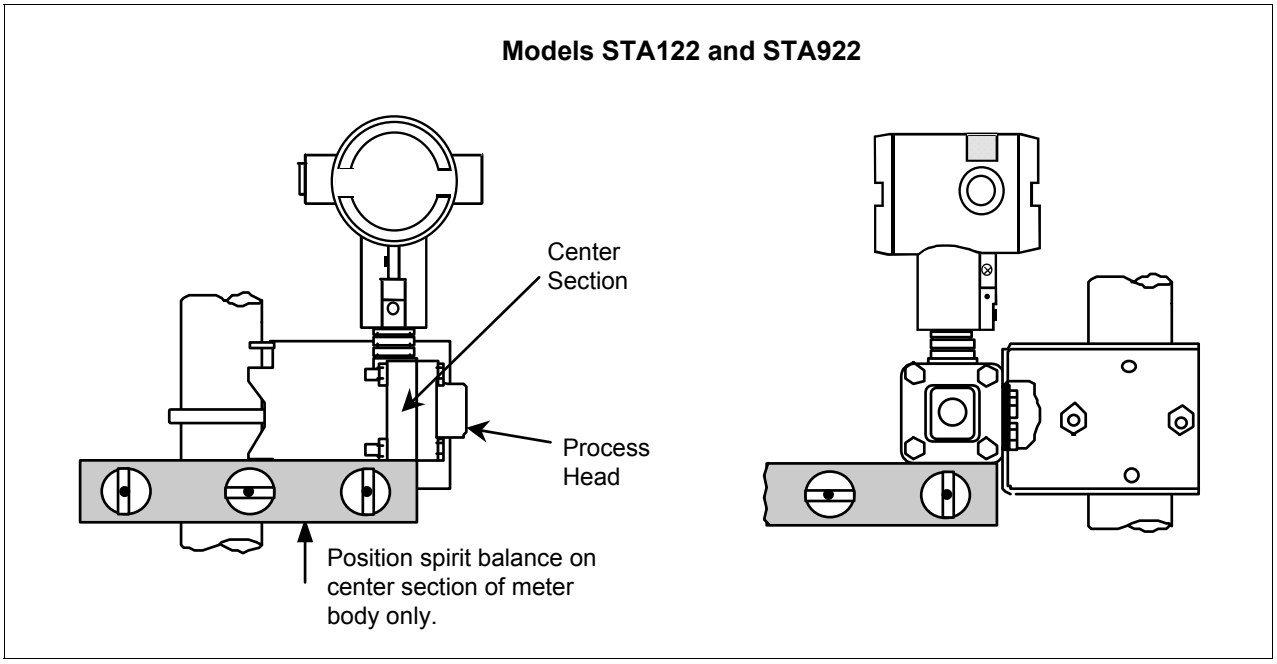
The mounting position of a model STA122 or STA922 Absolute Pressure Transmitter or a model STD110 Draft Range Differential Pressure Transmitter is critical as the transmitter spans become smaller. A maximum zero shift of 2.5 mm Hg for an absolute transmitter or 1.5 in H_2O for a draft range transmitter can result from a mounting position which is rotated 90 degrees from vertical. A typical zero shift of 0.12 mm Hg or 0.20 in H_2O can occur for a 5 degree rotation from vertical.

Precautions for Mounting Transmitters with Small Absolute or Differential Pressure Spans

To minimize these positional effects on calibration (zero shift), take the appropriate mounting precautions that follow for the given transmitter model.

For a model STA122 or STA922 transmitter, you must ensure that the transmitter is vertical when mounting it. You do this by leveling the transmitter side-to-side and front-to-back. See Figure 6 for suggestions on how to level the transmitter using a spirit balance.

Figure 6 Leveling a Model STA122 or 922 Absolute Pressure Transmitter.



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Precautions for Mounting Transmitters with Small Absolute or Differential Pressure Spans, continued

For a transmitter with a small differential pressure span, you must ensure that the transmitter is vertical when mounting it. You do this by leveling the transmitter side-to-side and front-to-back. See Figure 6 for suggestions on how to level the transmitter using a spirit balance. You must also zero the transmitter by following the steps in Table 9 below.

Table 9 Zero Corrects Procedure for STD110

Step	Action
1	Attach the transmitter to the mounting bracket but do not completely tighten the mounting bolts
2	Connect a tube between the input connections in the high pressure (HP) and low pressure (LP) heads to eliminate the affects of any surrounding air currents.
3	Connect 24 Vdc power to the transmitter and connect a digital voltmeter or SFC to read the transmitter's output. See Figure 1 for typical SFC connection or connect a voltmeter across the 250 ohm resistor, if desired.
4	Use the SFC (or SCT) and establish communications with the transmitter. Follow the steps in Table 2, if needed.
5	While reading the transmitter's output on an SFC or a voltmeter, position the transmitter so the output reading is at or near zero and then completely tighten the mounting bolts.
6	Do an input zero correct function using the SFC and following the steps below. This corrects the transmitter for any minor error that may occur after the mounting bolts are tightened.
7	Initiate shift key selection. Press [^ SHIFT] key Press [INPUT J OUT-PUT] key. Read applied input pressure. Press [RESET K COR-RECT] key. Prompt asks if the applied input pressure equals zero input. If it is zero input, go to next keystroke. If it is not, press [**CLR**] key to exit function and repeat keystrokes. Press [NON-VOL ENTER (Yes)] key. Zero input is set equal to applied input pressure.
8	Remove the tube from between the input connections, the power, and the digital voltmeter or SFC.
9	Continue with the remaining installation tasks.

Continued on next page

Flange mounting

To mount a flange mounted transmitter model, bolt the transmitter's flange to the flange pipe on the wall of the tank.

ATTENTION

On insulated tanks, remove enough insulation to accommodate the flange extension.

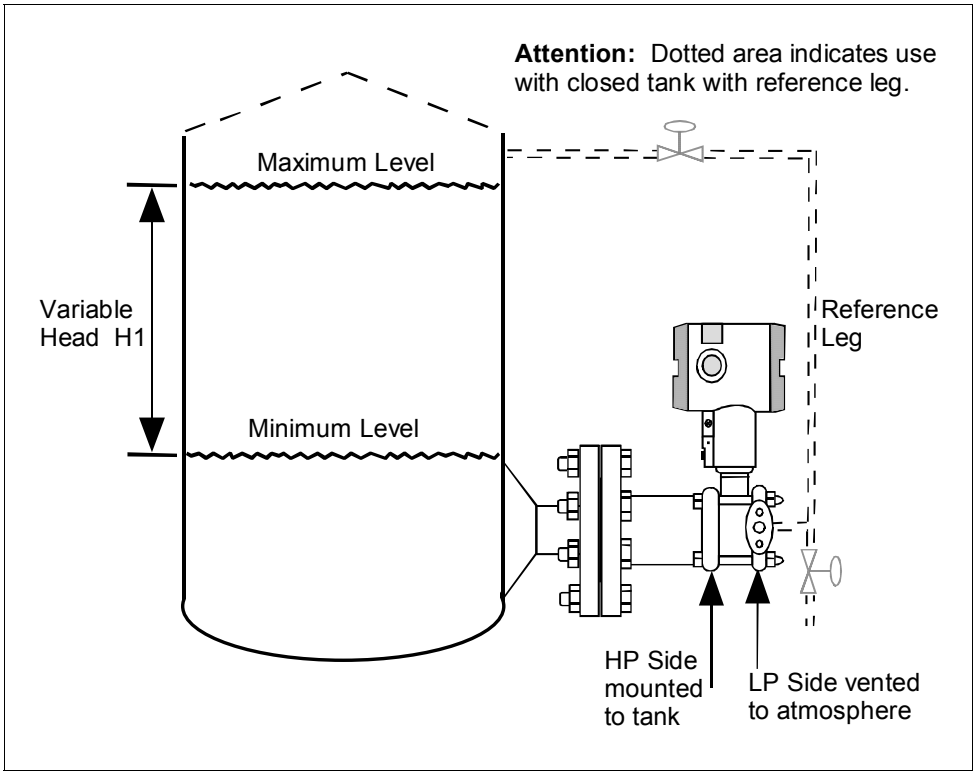
Figure 7 shows a typical installation for a transmitter with the flange on the high pressure (HP) side so the HP diaphragm is in direct contact with the process fluid. The low pressure (LP) side of the transmitter is vented to atmosphere (no connection).

It is the End User's responsibility to provide a flange gasket and mounting hardware that are suitable for the transmitter's service condition.

To prevent degradation of performance in Flush-Mounted Flanged Transmitters, exercise care to ensure that the internal diameter of the flange gasket does not obstruct the sensing diaphragm.

To prevent degradation of performance in Extended Mount Flanged Transmitters, ensure that there is sufficient clearance in front of the sensing diaphragm body.

Figure 7 Typical Flange Mounted Transmitter Installation



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Flush mounting

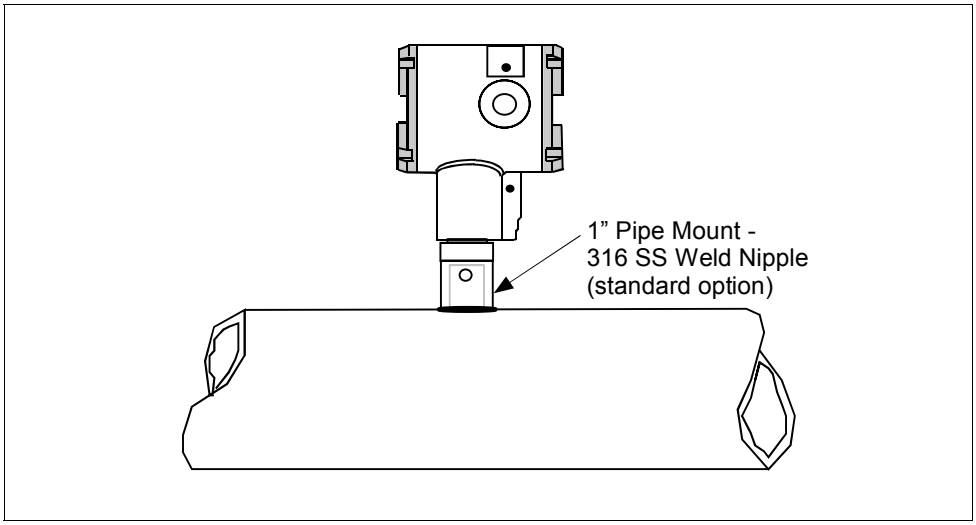
To mount a flush mounted transmitter model, cut a hole for a 1-inch standard pipe in the tank or pipe where the transmitter is to be mounted. Weld the 1-inch mounting sleeve to the wall of the tank or to the hole cut on the pipe. Insert the meter body of the transmitter into the mounting sleeve and secure with the locking bolt. Tighten the bolt to a torque of 8.1 to 13.5 N · m (6 to10 lb-ft). Figure 8 shows a typical installation for a transmitter with a flush mount on a pipe.

Once the transmitter is mounted, the transmitter housing can be rotated to the desired position. See Table 8, step 4.

ATTENTION

On insulated tanks, remove enough insulation to accommodate the mounting sleeve.

Figure 8 Typical Flush Mounted Transmitter Installation



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High Temperature Transmitter Mounting

You can mount the high temperature transmitter directly to the process flange connection or the process piping. Figure 9 shows typical pipe and flange mounted transmitter installations for comparison.

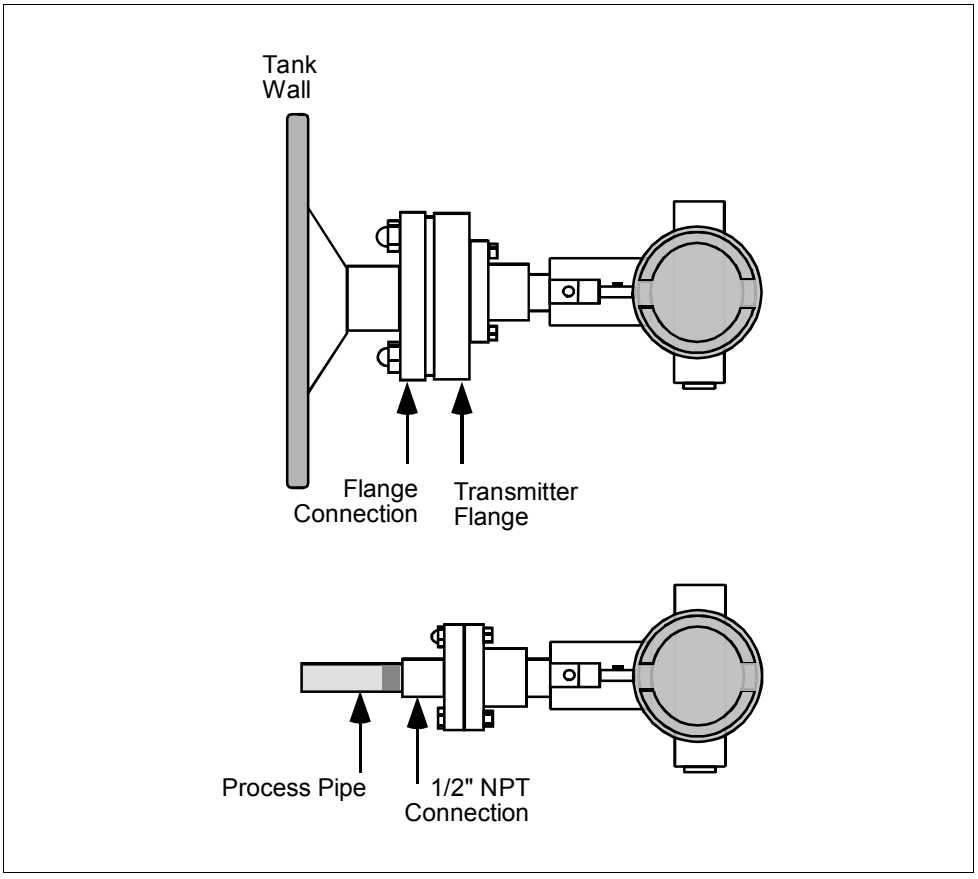
To mount a flange mounted transmitter model, bolt the transmitter's flange to the flange on the wall of the tank or process pipe.
It is the End User's responsibility to provide a flange gasket and mounting hardware that are suitable for the transmitter's service condition.

Once the transmitter is mounted, the transmitter housing can be rotated to the desired position. See Table 8, step 4.

ATTENTION

On insulated tanks, remove enough insulation to accommodate the flange extension.

Figure 9 Typical Pipe and Flange Mounted Installations



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Remote seal mounting

Use the procedure in Table 10 to mount a remote diaphragm seal transmitter model. Figure 10 shows a typical installation for a remote diaphragm seal transmitter for reference.

ATTENTION

Mount the transmitter flanges within the limits stated here for the given fill-fluid in the capillary tubes with a tank at one atmosphere.

IF the fill fluid is…	THEN mount the flange…
Silicone DC 200 Oil	no greater than 22 feet (6.7 meters) below the transmitter
Silicone DC 704 Oil	no greater than 19 feet (5.8 meters) below the transmitter
Chlorotrifluorethylene	no greater than 11 feet (3.4 meters) below the transmitter.

NOTE: The combination of tank vacuum and high pressure capillary head effect should not exceed 9 psi (300 mm Hg) absolute.

Table 10 Mounting Remote Diaphragm Seal Transmitter

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Mount transmitter at a remote distance determined by length of capillary tubing.</td></tr>
<tr><td>2</td><td>
<table>
<tr><th>If Transmitter Model Number is…</th><th>Then Connect Remote Seal on…</th></tr>
<tr><td>STR93D or STR12D</td><td>high pressure (HP) side of transmitter to lower flange mounting on tank wall for variable head H1.</td></tr>
<tr><td>STR13D</td><td>low pressure (LP) side of transmitter to lower flange mounting on tank wall for variable head H1.</td></tr>
</table>
ATTENTION On insulated tanks, remove enough insulation to accommodate the flange extension.
</td></tr>
</table>

Continued on next page

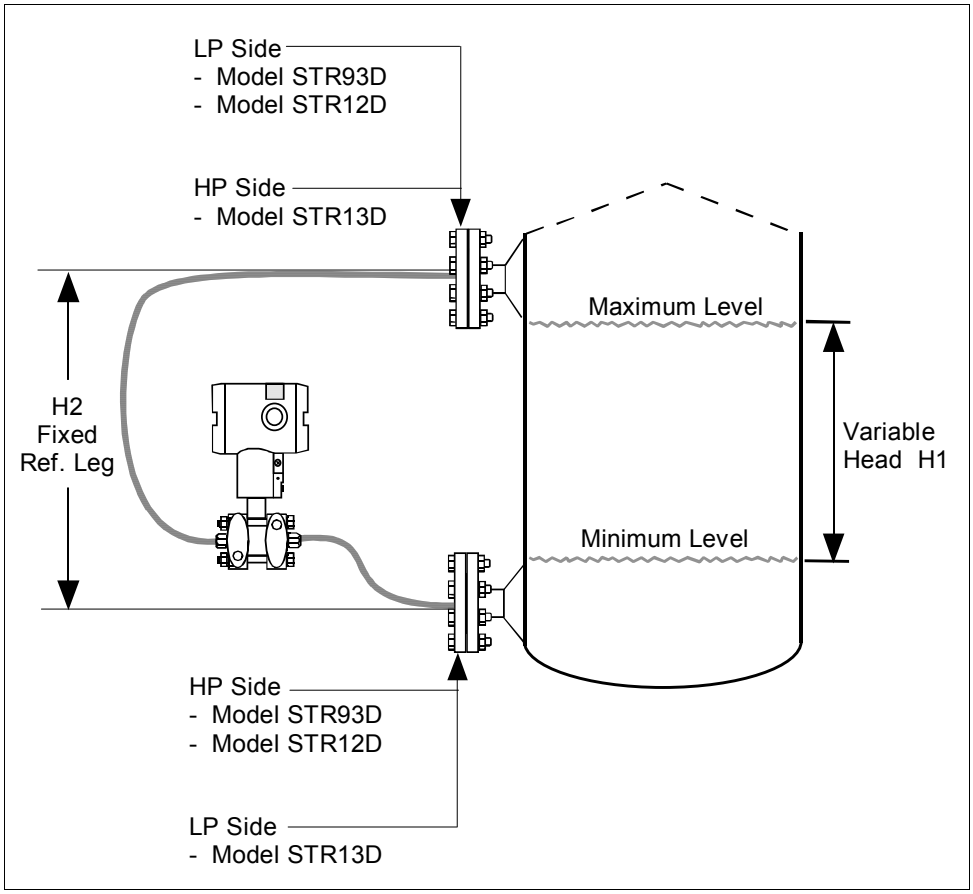
Remote seal mounting, continued

Table 10 Mounting Remote Diaphragm Seal Transmitter, continued

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>3</td><td>
<table>
<tr><th>If Transmitter Model Number is…</th><th>Then Connect Remote Seal on…</th></tr>
<tr><td>STR93D or STR12D</td><td>low pressure (LP) side of transmitter to upper flange mounting on tank wall for fixed or constant head H2.</td></tr>
<tr><td>STR13D</td><td>high pressure (HP) side of transmitter to upper flange mounting on tank wall for fixed or constant head H2.</td></tr>
</table>
*

ATTENTION On insulated tanks, remove enough insulation to accommodate the flange extension.
</td></tr>
<tr><td>4</td><td>It is the End User’s responsibility to provide a flange gasket and mounting hardware that are suitable for the transmitter’s service condition</td></tr>
</table>

Figure 10 Typical Remote Diaphragm Seal Transmitter Installation.



4.2 Piping ST 3000 Transmitter

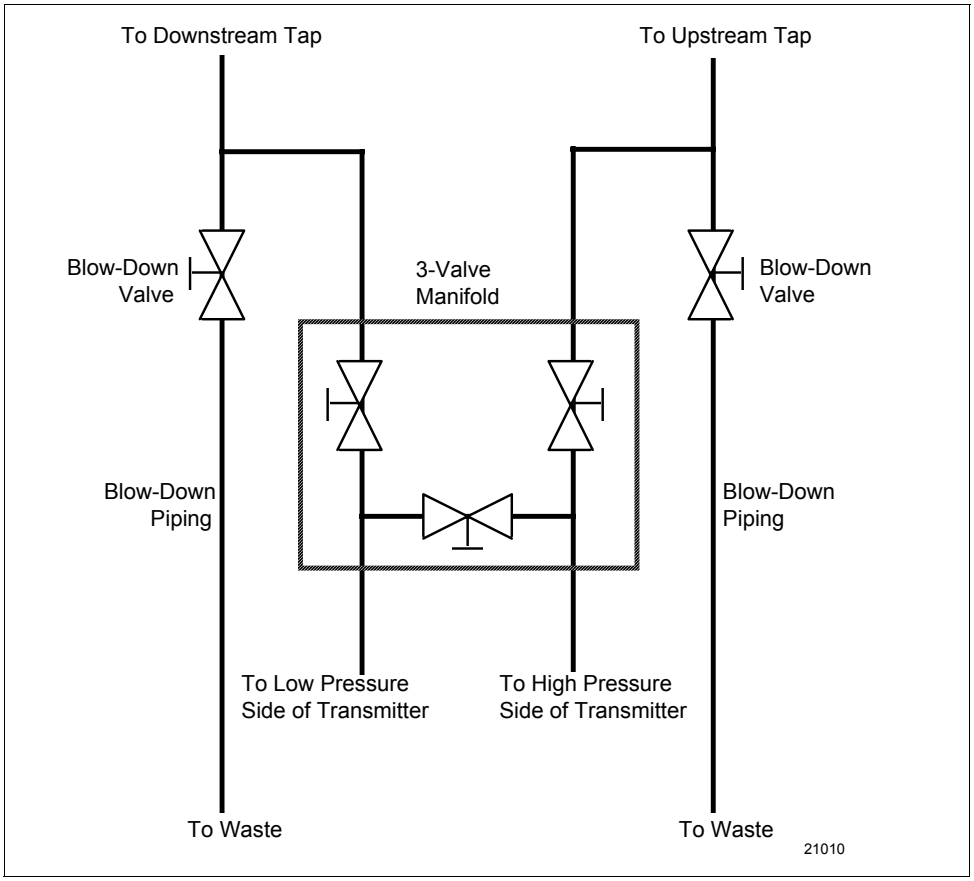
Summary

The actual piping arrangement will vary depending upon the process measurement requirements and the transmitter model. Except for flanged and remote diaphragm seal connections, process connections are made to ¼ inch or ½ inch NPT female connections in the process head of the transmitter's meter body. For example, a differential pressure transmitter comes with double ended process heads with ¼ inch NPT connections but they can be modified to accept ½ inch NPT through optional flange adapters. Some gauge pressure transmitters may have a ½ inch NPT connection which mounts directly to a process pipe.

The most common type of pipe used is ½ inch schedule 80 steel pipe. Many piping arrangements use a three-valve manifold to connect the process piping to the transmitter. A manifold makes it easy to install and remove or rezero a transmitter without interrupting the process. It also accommodates the installation of blow-down valves to clear debris from pressure lines to the transmitter.

Figure 11 shows a diagram of a typical piping arrangement using a three-valve manifold and blow-down lines for a differential pressure transmitter being used to measure flow.

Figure 11 Typical 3-Valve Manifold and Blow-Down Piping Arrangement.



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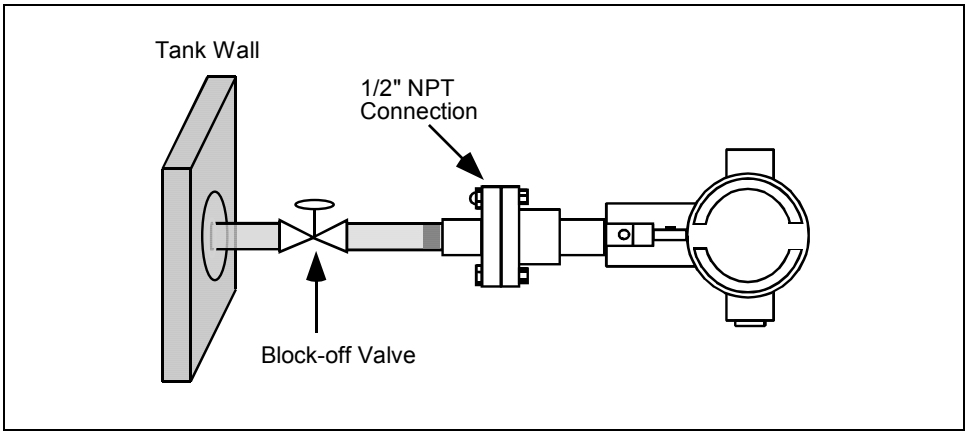
Piping Arrangements, continued

Another piping arrangement uses a block-off valve and a tee connector in the process piping to the transmitter as shown in Figure 12.

Figure 12 Typical Arrangement for ½" NPT Process Connection Piping



Transmitter location

Table 11 lists the mounting location for the transmitter depending on the process.

Table 11 Suggested Transmitter Location for Given Process

Process	Suggested Location	Explanation
Gases	Above the gas line	The condensate drains away from the transmitter.
Liquids	1. Below but close to the elevation of the process connection. 2. Level with or above the process connection.	1. This minimizes the static head effect of the condensate. 2. This requires a siphon to protect the transmitter from process steam. The siphon retains water as a "fill fluid."

ATTENTION

For liquid or steam, the piping should slope a minimum of 25.4 mm (1 inch) per 305 mm (1 foot). Slope the piping down towards the transmitter if the transmitter is below the process connection so the bubbles may rise back into the piping through the liquid. If the transmitter is located above the process connection, the piping should rise vertically above the transmitter; then slope down towards the flowline with a vent valve at the high point. For gas measurement, use a condensate leg and drain at the low point (freeze protection may be required here).

Continued on next page

ATTENTION

Care must be taken when installing transmitters on hot processes. The operating temperature limits for the device (as listed in Table 6) must not be exceeded. Impulse piping may be used to reduce the temperature of the process that comes into contact with the transmitter meter body. As a general rule there is a 56 degree C drop (100 °F) in the temperature of the process for every foot (305 mm) of ½ inch uninsulated piping.

Process connections

Table 12 describes typical process connections for a given type of transmitter.

Table 12 Process Connections

Transmitter Type	Process Connection
Differential Pressure	• Process heads with 1/4-inch NPT female connection. • Flange adapters and manifolds with 1/2-inch female connection are optional. • Models with pseudo flange on one side include 2- or 3-inch ANSI class 150 flange.
Gauge Pressure	• Process head with 1/2-inch NPT female connection (Series 100 transmitters). • In-line 1/2-inch NPT female connection (STGxxL). • Process heads with 1/4-inch NPT female connection (STG9x4). • Flange adapters and manifolds with 1/2-inch female connections are optional (STG9x4). • 2-inch Sanitary Tri-Clamp (STG1xT). • Flush mount in 1-inch weld sleeve, with O-ring and locking bolt (STG9xP).
Absolute Pressure	• Process head with 1/2-inch NPT female connection. (STAx2, x40).
Flange Mounted Liquid Level	• Small flange 1/2-inch, 1-, 1 ½ - and 2-inch (STFxxT) • 2, 3- or 4-inch flange with flush or 2-, 4- or 6-inch extended diaphragm (See Table 13) on high pressure side.* • DN 50, 80, or 100 PN 40 flange with flush or 2, 4 or 6 inch extended diaphragm (See Table 13) on High Pressure Side*.
Remote Diaphragm Seals	See Model Selection Guide for description of available Flanged, Threaded, Chemical Tee, Saddle, and Sanitary process connections.

* Reference side has standard differential pressure process head.

Continued on next page

Flange descriptions

Table 13 describes the available flange connections for flange mounted liquid level transmitters.

Table 13 Flange Description

Transmitter Type	Description
Flush or Extended Diaphragm	2-inch 150# serrated–face flange with 4 holes 19 mm (3/4 in) diameter on 120.7 mm (4.75 in) diameter bolt circle and an outside diameter of 150 mm (5.91 in).
	2-inch 150# serrated–face flange with 8 holes 19 mm (3/4 in) diameter on 127 mm (5.00 in) diameter bolt circle and an outside diameter of 165 mm (6.50 in).
	3-inch 150# serrated–face flange with 4 holes 19 mm (3/4 in) diameter on 152.4 mm (6.00 in) diameter bolt circle and an outside diameter of 190 mm (7.48 in).
	3-inch 300# serrated–face flange with 8 holes 22.2 mm (7/8 in) diameter on 168.3 mm (6.62 in) diameter bolt circle and an outside diameter of 210 mm (8.27 in).
	4-inch 150# serrated–face flange with 4 holes 19 mm (3/4 in) diameter on 190.5 mm (7.50 in) diameter bolt circle and an outside diameter of 230 mm (9.05 in).
	4-inch 300# serrated–face flange with 8 holes 22.2 mm (7/8 in) diameter on 255 mm (10.04 in) diameter bolt circle and an outside diameter of 200 mm (7.87 in).
	DN 50 PN 40 serrated–face flange with 4 holes 18 mm (0.71 in) diameter on 125 mm (4.92 in) diameter bolt circle and an outside diameter of 165 mm (6.50 in).
	DN 80 PN 40 serrated–face flange with 8 holes 18 mm (0.71 in) diameter on 160 mm (6.30 in) diameter bolt circle and an outside diameter of 200 mm (7.87 in).
	DN 100 PN 40 serrated–face flange with 8 holes 22 mm (0.87 in) diameter on 190 mm (7.48 in) diameter bolt circle and an outside diameter of 235 mm (9.25 in).
Pseudo Flange Head	2-inch, 150 lbs serrated-face flange with 4 holes 15.9 mm (5/8 in) diameter on 120.6 mm (4-3/4 in) diameter bolt circle and an outside diameter of 152.4 mm (6 in).
	3-inch, 150 lbs serrated-face flange with 4 holes 19 mm (3/4 in) diameter on 152 mm (6 in) diameter bolt circle and an outside diameter of 190 mm (7-1/2 in).
Flush Mount Gauge STG93P	25.4 mm (1-inch) pipe mount. (316L SS standard option.)

General piping guidelines

- When measuring fluids containing suspended solids, install permanent valves at regular intervals to blow-down piping.
- Blow-down all lines on new installations with compressed air or steam and flush them with process fluids (where possible) before connecting these lines to the transmitter's meter body.
- Be sure all the valves in the blow-down lines are closed tight after the initial blow-down procedure and each maintenance procedure after that.

Continued on next page

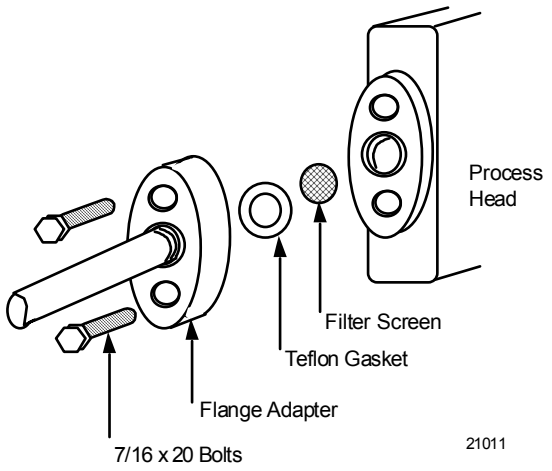
Installing flange adapter

Table 14 gives the steps for an optional flange adapter on the process head.

ATTENTION

Slightly deforming the gasket supplied with the adapter before you insert it into the adapter may aid in retaining the gasket in the groove while you align the adapter to the process head. To deform the gasket, submerse it in hot water for a few minutes then firmly press it into its recessed mounting groove in the adapter.

Table 14 Installing Flange Adapter

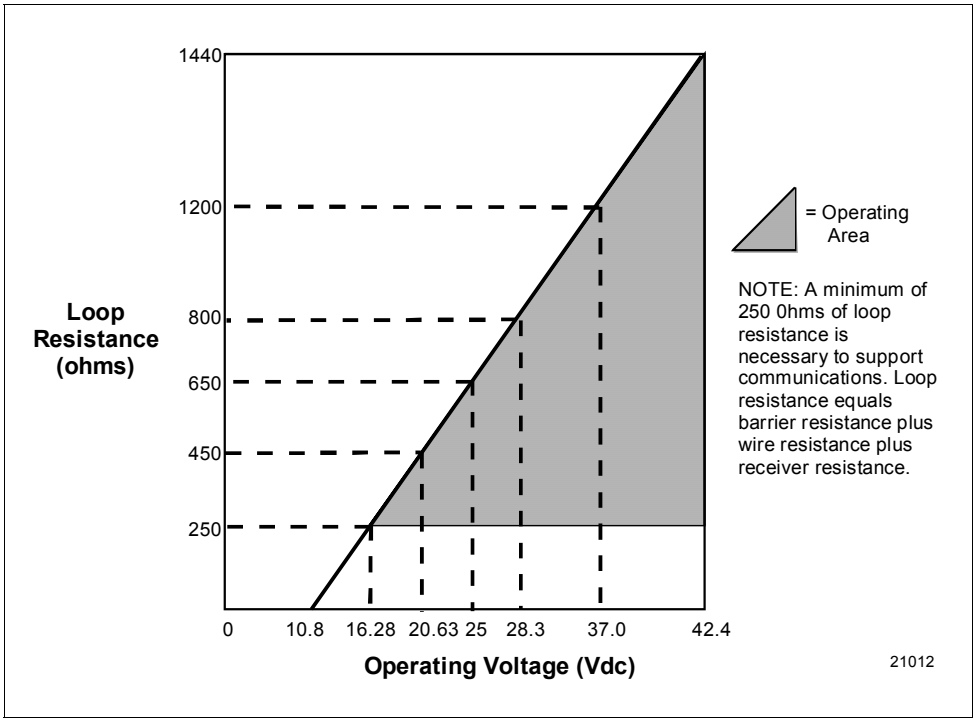
Step	Action
1	Insert filter screen (if supplied) into inlet cavity of process head.
2	Carefully seat Teflon (white) gasket into adapter groove.
3	Thread adapter onto 1/2-inch process pipe and align mounting holes in adapter with holes in end of process head as required.
4	Secure adapter to process head by hand tightening 7/16-20 hex-head bolts. Example - Installing adapter on process head.  **ATTENTION** Apply an anti-seize compound on the stainless steel bolts prior to threading them into the process head.
5	Evenly torque flange adapter bolts to a torque of 27,1 Nm +/- 1,4 Nm (20 ft lbs +/- 1.0 ft lbs)

4.3 Wiring ST 3000 Transmitter

Summary

The transmitter is designed to operate in a two-wire power/current loop with loop resistance and power supply voltage within the operating range shown in Figure 13.

Figure 13 Operating Range for ST 3000 Transmitters.



Loop wiring is connected to the transmitter by simply attaching the positive (+) and negative (–) loop wires to the positive (+) and negative (–) SIGNAL screw terminals on the terminal block in the transmitter's electronics housing shown in Figure 14.

Each transmitter includes an internal ground terminal to connect the transmitter to earth ground. A ground terminal can be optionally added to the outside of the electronics housing. While it is not necessary to ground the transmitter for proper operation, we suggest that you do so to minimize the possible effects of "noise" on the output signal and provide additional protection against lightning and static discharge damage.
Note that grounding may be required to meet optional approval body certification. Refer to Section 1 CE Conformity (Europe) Notice for special conditions.

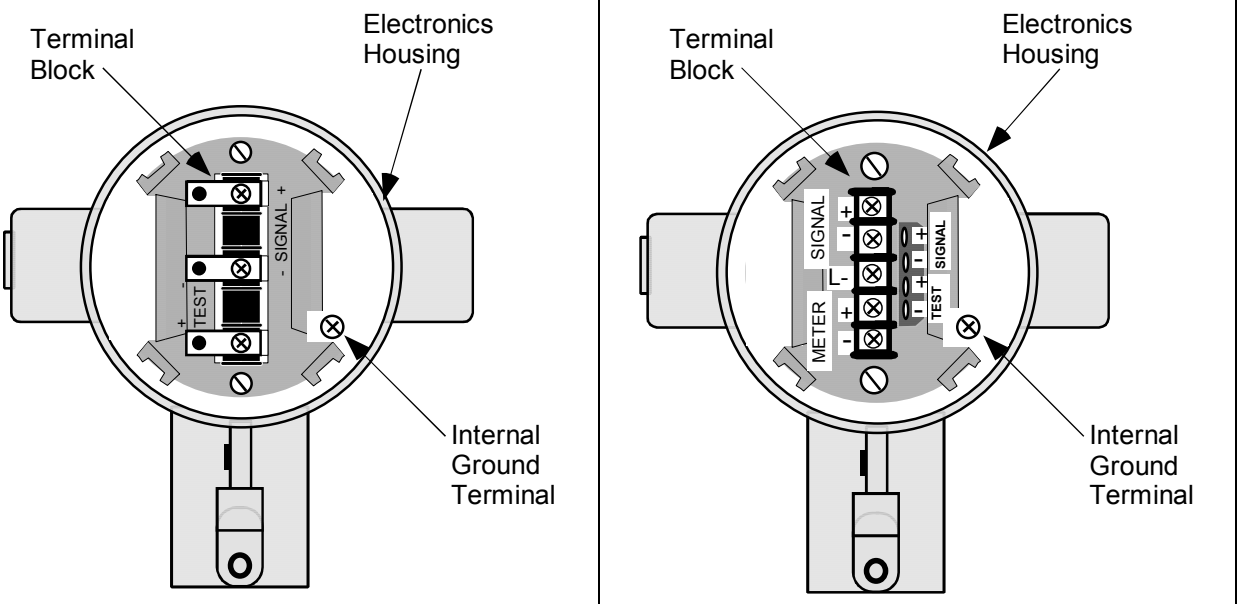
Optional lightning protection (option LP) can be ordered for transmitters that will be installed in areas highly susceptible to lightning strikes. Figure 14 shows the 5-screw terminal block used when the lightning protection option is ordered.

Continued on next page

Summary, continued

Barriers can be installed per manufacturer's instructions for transmitters to be used in intrinsically safe applications.

Figure 14 ST 3000 Transmitter Terminal Block



TPS reference

Transmitters that are to be digitally integrated to Honeywell's TPS system will be connected to the Smart Transmitter Interface Module in the Process Manager, Advanced Process Manager or High Performance Process Manager through a Field Termination Assembly. Details about Honeywell's TPS system connections are given in the *PM/APM Smartline Transmitter Integration Manual PM12-410* which is part of the TDC 3000^X system bookset.

Allen-Bradley PLC

If you are digitally integrating the ST 3000 to an Allen Bradley PLC, the same FTA and wiring procedures used with Honeywell's TPS system are also used with the Allen-Bradley 1771 and 1746 platforms.

For more information, contact:

ProSoft Technology, Inc.
(800) 326-7066 or
http://www.psft.com

Continued on next page

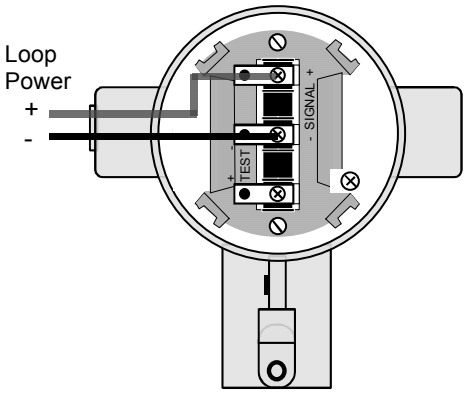
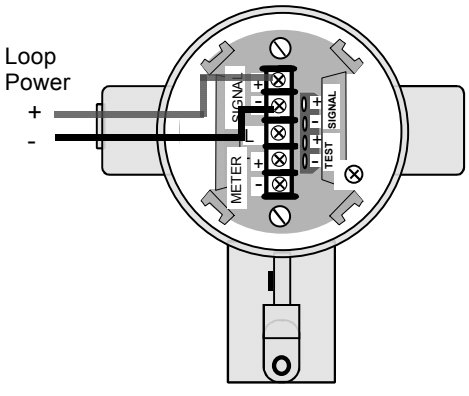
Wiring connections

The procedure in Table 15 shows the steps for connecting power to the transmitter. For loop wiring and external wiring diagrams, refer to the installation drawings presented in Section 5. Detailed drawings are provided for transmitter installation in non-intrinsically safe areas and for intrinsically safe loops in hazardous area locations. If you are using the transmitter with Honeywell's TPS system, see the previous TPS reference.

ATTENTION

- All wiring must comply with local codes, regulations, and ordinances.
- If you will be using the transmitter in a hazardous area, be sure to review the hazardous location reference data included in Appendix A of this manual before operating the transmitter.

Table 15 Wiring the Transmitter

Step	Action
1	Loosen end-cap lock using a 1.5 mm allen wrench and remove end-cap cover from terminal block end of transmitter housing.
2	Feed loop power leads through one of conduit entrances on either side of transmitter housing. Plug whichever entrance you do not use. **ATTENTION** The transmitter accepts up to 16 AWG wire.
3	Observing polarity, connect positive loop power lead to SIGNAL + terminal and negative loop power lead to SIGNAL – terminal. Example - Connecting loop power to transmitter. 3-screw terminal block  5-screw terminal (option LP) 
4	Replace end-cap, and tighten end-cap lock.

Continued on next page

Approval body requirements

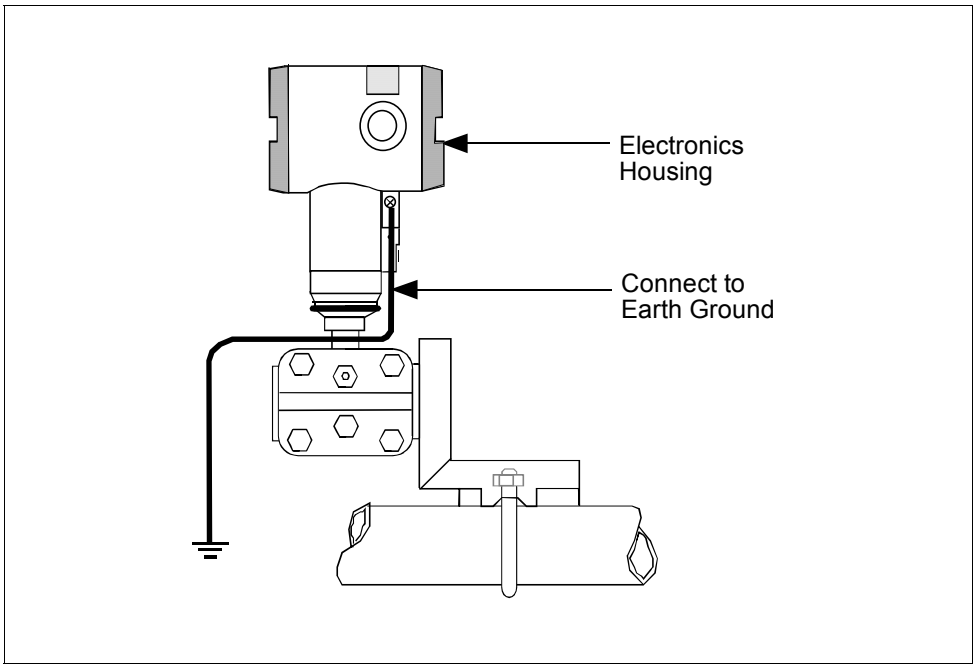
If your transmitter was ordered with Table III option 3N for self-declared approval per 94/9/EC (ATEX4), you must use a power supply that includes a voltage limiting device that will keep the voltage to the transmitter from exceeding 42 Vdc. You can achieve this by using a battery as the supply or one of these voltage limiting means.

- Double wound mains transformer per BS 3535 or equivalent.
- An adequately rated zener diode whose voltage is not significantly higher than the rated voltage.
- An adequately rated semiconductor voltage regulator.

Lightning protection

When your transmitter is equipped with optional lightning protection, you must connect a wire from the transmitter to ground as shown in Figure 15 to make the protection effective. We recommend that you use a size 8 (American Wire Gage) or (8.37mm^2) bare or green covered wire.

Figure 15 Ground Connection for Lightning Protection.



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Conduit seal

Transmitters installed as explosionproof in a Class I, Division 1, Group A Hazardous (Classified) Location in accordance with ANSI/NFPA 70, the US National Electrical Code (NEC), require a "LISTED" explosionproof seal to be installed in the conduit, within 18 inches of the transmitter. Crouse-Hinds® type EYS/EYD or EYSX/EYDX are examples of "LISTED" explosionproof seals that meets this requirement.

Transmitters installed as explosionproof in a Class I, Division 1, Group B, C or D Hazardous (Classified) Locations do not require an explosionproof seal to be installed in the conduit.

NOTE: Installation should conform to all national and local electrical code requirements.

WARNING

When installed as explosionproof in a Division 1 Hazardous Location, keep covers tight while the transmitter is energized. Disconnect power to the transmitter in the non-hazardous area prior to removing end caps for service.

When installed as nonincendive equipment in a Division 2 Hazardous Location, disconnect power to the transmitter in the non-hazardous area, or determine that the location is non-hazardous prior to disconnecting or connecting the transmitter wires.

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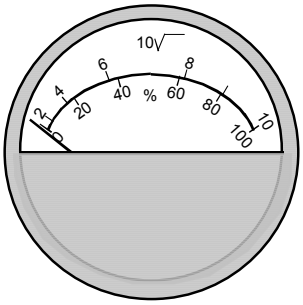
Existing meter connections

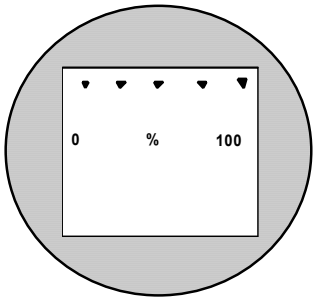
Existing analog meters and SM 3000 Smart Meters can be connected to Release 300 transmitters. Examples of each meter type are shown below.

Analog Meter



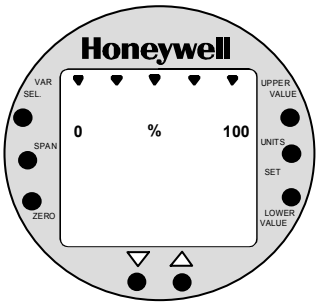
Analog Meter Connections —You can connect the analog meter (2-wires) integrally to Release 300 transmitter's terminal block inside the electronics housing. However, there are alternate wiring methods for connecting an analog meter remotely with the loop wiring. Section 13 in this manual illustrates alternate wiring methods for connecting an analog meter to Release 300 transmitters.

Smart Meter



SM 3000 Smart Meter Connections —The smart meter (3-wires) can be connected remotely to a Release 300 transmitter. Section 13 in this manual illustrates alternate wiring methods for connecting this smart meter to Release 300 transmitters.

New Smart Meter with Local Zero and Span



New Smart Meter Connections – The new integral smart meter (8-wires) is connected directly to the transmitter's PWA and is mounted to the electronics module assembly inside the electronics housing. The new integral smart meter is designed for the ST 3000 Release 300 transmitter and provides functionality not available with other smart meter designs.

NOTE: Only one smart meter should be installed integrally to the transmitter.

ATTENTION

Be aware that the RMA 300 remote meter does not have custom and flow units capability like the new smart meter. Therefore, if you use a local smart meter that is configured to display readings in custom or flow units in conjunction with an RMA 300 remote meter, the readings of the two meters will be in different units.

Section 5 —Reference Drawings

5.1 Wiring Diagrams and Dimension Drawing List

Contents

This section contains external wiring diagrams for guidance in wiring the transmitter and remote meters in hazardous and nonhazardous locations. Tables listing the available dimension drawings for ST 3000 transmitters are provided for reference.

External Wiring Diagrams

These wiring diagrams are included in numerical order behind this section for wiring reference.

ST 3000 Release 300 Series 100, 900 Transmitters

Description	Drawing Number
For non-intrinsically safe application	30753607
For intrinsically safe application (FM)	51204241
For intrinsically safe application (CSA)	51204242
For intrinsically safe application (CENELEC)	51204243

Continued on next page

Dimension Drawings

The tables on the following pages list available dimension drawings for reference. If you need a copy of a drawing, please determine the appropriate drawing number from the following tables and contact your Honeywell representative to obtain a copy.

Dimension Drawings - Series 100 and Series 900

Transmitter Type and Key Number	Table Selections	Mounting				Drawing Number
		Angle Bracket (MB), (SB)		Flat Bracket (FB)		
		Vertical Pipe	Horizontal Pipe	Vertical Pipe	Horizontal Pipe	
Differential Pressure						
STD110, STD120, STD125*,	See Key Number	51205895		51205893		⇐
STD130, STD170	Column		51205894		51205892	⇐
*STD125	–	Tank HTG				30756435-000
STD904, STD924, STD930,	Table I -	51500357		51500355		⇐
STD974	C, D, G, H, K, L		51500356		51500354	⇐
STD924, STD930	Table I -	X		X		
	A, B, E, F, J		X		X	

Transmitter Type and Key Number	Equipped with A-G manifold part #	Angle Bracket (MB), (SB)		Flat Bracket (FB)		Drawing Number
		Vertical Pipe	Horizontal Pipe	Vertical Pipe	Horizontal Pipe	
Differential Pressure (with Anderson-Greenwood 3-way valve manifold)						
STD110, STD120, STD125*,	M4AV1	51500426	51500424	51500428	51500422	⇐
STD130, STD170	M4TV1	51500427	51500425	51500429	51500423	⇐
STD924, STD930	M4AV1	51500431	51500433	51500435	51500437	⇐
	M4TV1	51500430	51500432	51500434	51500436	⇐
STD904, STD924, STD930,	M4AV1	51500442	51500440	51500444	51500438	⇐
STD974	M4TV1	51500443	51500441	51500445	51500439	⇐

Continued on next page

Dimension Drawings - Series 100 and Series 900, Continued

Transmitter Type and Key Number	Table Selections	Mounting				Drawing Number
		Angle Bracket (MB), (SB)		Flat Bracket (FB)		
		Vertical Pipe	Horizontal Pipe	Vertical Pipe	Horizontal Pipe	
Gauge and Absolute Pressure						
STG944, STG974	See Key Number Column	51500411		51500409		⇐
			51500410		51500408	⇐
STG140, STG170, STG180, STA122, STA140	See Key Number Column	51500362		51500360		⇐
			5500361		51500359	⇐
STA922, STA940		51500366		515004364		⇐
			51500365		51500363	⇐
STG14L, STG17L, STG18L		51500373		51500371		⇐
			51500372		51500370	⇐
STG90L, STG94L, STG97L, STG98L		51500377		51500375		⇐
			51500376		51500374	⇐
STG14T (High Temperature)	½-inch NPT					51404482
	Flush Sanitary Seal					51404484

Continued on next page

Dimension Drawings – Series 100 and Series 900, Continued

Transmitter Type and Key Number	Table Selections	Mounting	Drawing Number
Flange Mount			
STF128, STF132	Table II (Flush) 0_1F0, 0_2F0, 0_3F0	–	51500404
	Table II (Extended) 0_5_0	–	51500405
	Table I Z_ _ (Sanitary) Table II 0S0_0	–	51500418
STF924, STF932	Table II (Flush) 0_1F0, 0_2F0, 0_3F0	–	51500406
	Table II (Extended) 0_5_0	–	51500407
	Table I Z_ _ (Sanitary) Table II 0S0_0	–	51500419
STF12F, STF13F	–	–	51500420
STF92F, STF93F	–	–	51500421
STF14F	–	Tank HTG	30756436-000 30755981-000
STF14T (High Temperature)	½, 1, 1 ½, and 2-inch Flange	–	51404481
Flush Mount			
STG93P	–	–	51404716-000

For ST3000 Transmitter Revision "S" (ie STF128 S, STF12F S) or greater

Transmitter Type and Key Number	Table Selections	Mounting	Drawing Number
CFF Flange Mount			
STF128, STF132, STF 924, STF 932	Table II - -1- -, - - 2 - -, - - 3 - -	Flush Flange Mount	50008473
	Table II - - 5 - -	Extended Flange Mount	50008475
STF12F, STF13F, STF14F, STF92F, STF93F	Table II - T - -, - R - -, -P - -	Pseudo Flange Head Mount	50008474

Transmitter Type and Key Number	Table Selections	Mounting				Drawing Number
		Angle Bracket (MB), (SB)		Flat Bracket (FB)		
		Vertical Pipe	Horizontal Pipe	Vertical Pipe	Horizontal Pipe	
Remote Seals						
STR14A**	–	51500415		51500413		⇐
	–		51500414		51500412	⇐
STR12D**, STR13D**	Table I 2_ _	51500399		51500397		⇐
			51500398		51500396	⇐
	Table I 1_ _, 3_ _	51500403		51500401		⇐
			51500402		51500400	⇐
STR12D**	Table I _ _D	–				51500386
STR93D **	Table I 1, 3_ _	51500395		51500393		⇐
			51500394		51500392	⇐
	Table I 2_ _	51500391		51500389		⇐
			51500390		51500388	⇐
	Table I _2_ or _6_	–				51402418-000
STR14G**, STR17G**	–	51500381		51500379		⇐
	–		51500380		51500378	⇐
STR14G, STR17G, STR94G	Table I _2_ or _6_	–				51402418-000
STR94G**	–	51500385		51500383		⇐
	–		51500384		51500382	⇐
STR94G**	Table I _ _D	–				51500387
CFF Remote Seals						
STR12D**, STR13D**, STR93D**	Table I 2 - -	50008730	50008729	50008728	50008727	⇐
	Table I 1 - -	50008734	50008733	50008732	50008731	⇐
	Table I 3 - -	50008738	50008737	50008736	50008735	⇐
STR12D**, STR13D**, STR93D**	Table I 1 - D					50008725
	Table I 3 - D					50008726

(See next page for ** reference)

Dimension Drawings - Series 100 and Series 900, Continued

Transmitter Type and Key Number	Table Selections	Mounting	Drawing Number
***STR_ _ _*	***Table II***		
Flush Flange 3.5” diaphragm	_ _ _A_ _ _ _ _ _ _ _	–	51305141-000
Off Line Flange 2.4” diaphragm	_ _ _B _ _ _ _ _ _ _		51305138-000
Off Line Flange 2.9” diaphragm	_ _ _C _ _ _ _ _ _ _ _		51305139-000
Off Line Flange 4.1” diaphragm	_ _ _D _ _ _ _ _ _ _ _		51305140-000
Extended Flange 2.9” diaphragm	_ _ _E _ _ _ _ _ _ _ _		51305137-000
Extended Flange 3.5” diaphragm	_ _ _F_ _ _ _ _ _ _ _		51305137-000
Pancake Seal	_ _ _G_ _ _ _ _ _ _ _		51305144-000
Chemical Tee “Taylor” Wedge	_ _ _H_ _ _ _ _ _ _ _		51305144-000
Threaded Connection 2.4” diaphragm	_ _ _J_ _ _ _ _ _ _ _		51305148-000
Threaded Connection 2.9” diaphragm	_ _ _K_ _ _ _ _ _ _ _		51305148-000
Threaded Connection 4.1” diaphragm	_ _ _L_ _ _ _ _ _ _ _		51305148-000
Sanitary Seal 1.9” diaphragm	_ _ _M_ _ _ _ _ _ _ _		51305143-000
Sanitary Seal 2.4” diaphragm	_ _ _N_ _ _ _ _ _ _ _		51305143-000
Sanitary Seal 2.9” diaphragm	_ _ _P_ _ _ _ _ _ _ _		51305143-000
Sanitary Seal 4.1” diaphragm	_ _ _Q_ _ _ _ _ _ _ _		51305143-000
Saddle Seal	_ _ _R_ _ _ _ _ _ _ _		51305142-000

Appendix A —Smart Meter Reference

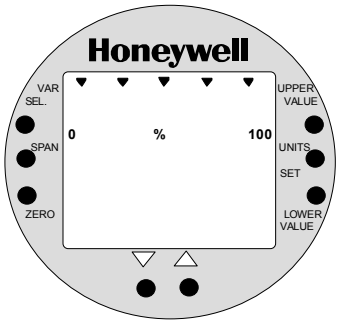
A.1 Introduction

Smart Meter Option

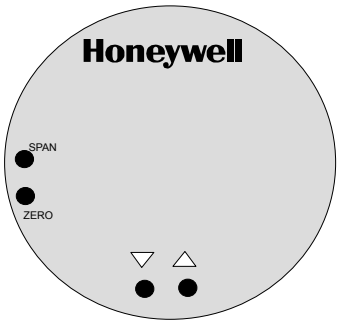
Depending upon your transmitter model, you can equip the ST 3000 transmitter with the Smart Meter option (option SM). This new integral smart meter is designed for ST 3000 Release 300 Transmitters and provides functionality not available with other smart meter designs.

The smart meter provides an LCD local interface that displays both analog and digital indications of the transmitter output and can be configured to display pressure in user-selected engineering units. There are two meter option types:

1. Smart Meter with local Zero and Span Adjustments – Features smart meter LCD interface, pushbuttons for setting engineering units and lower range/upper range values, and zero/span adjustments.



2. Local Zero and Span Adjustments only – Provides pushbuttons to make zero and span adjustments.



NOTE: The Model STD110 does not support local zero and span adjustments.

Smart Meter Set up

The smart meter can be set up to display pressure in a number of user-selected engineering units or even custom units, if required. The meter display set up is part of the transmitter configuration database and can be performed when configuring the transmitter. You can use either the Smartline© Configuration Toolkit (SCT 3000) software program or the Smart Field Communicator (SFC) to configure the transmitter and the smart meter. You can also use the pushbuttons on the front of the meter to set up the smart meter display. The procedures for meter set up using any of these configuration devices are provided in this appendix.

A.2 Smart Meter Display

Display description

Figure A-1 shows a smart meter display with all its indicators and segments lit for reference.
Table A-1 shows a smart meter with the pushbuttons highlighted and a brief description of each pushbutton. The pushbuttons are used for setting up the smart meter display and making zero and span adjustments.

Figure A-1 Smart Meter Display with All Indicators Lit.

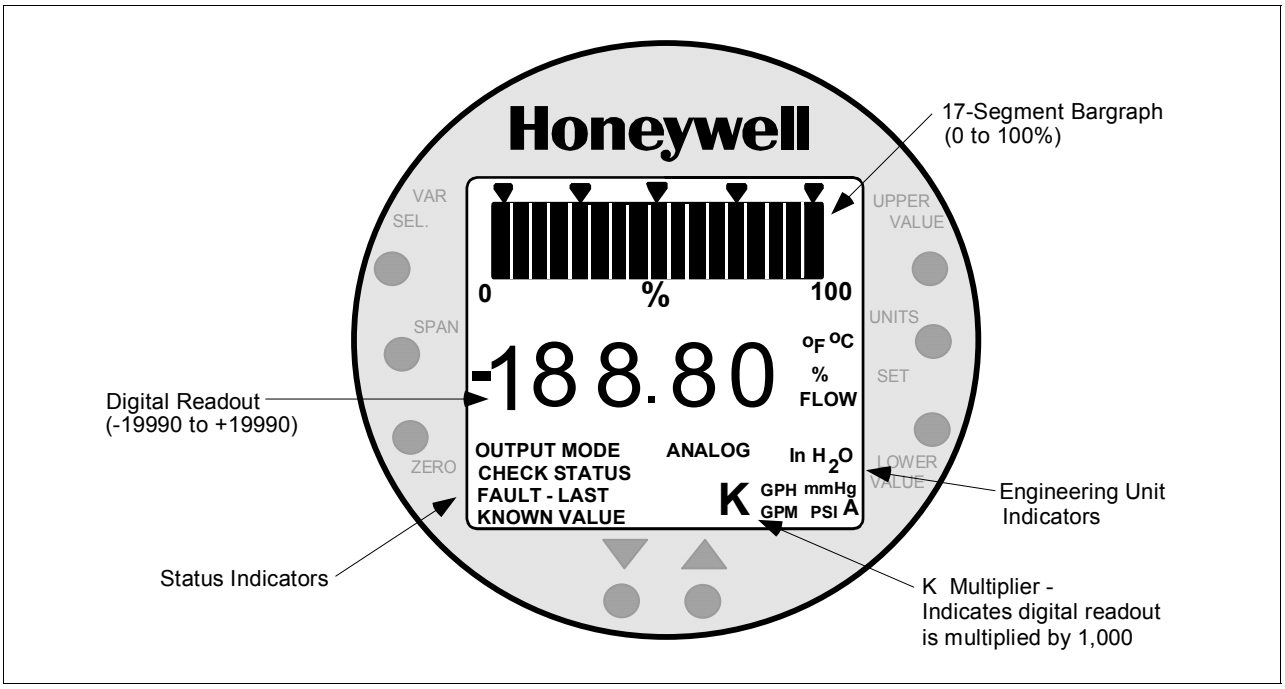
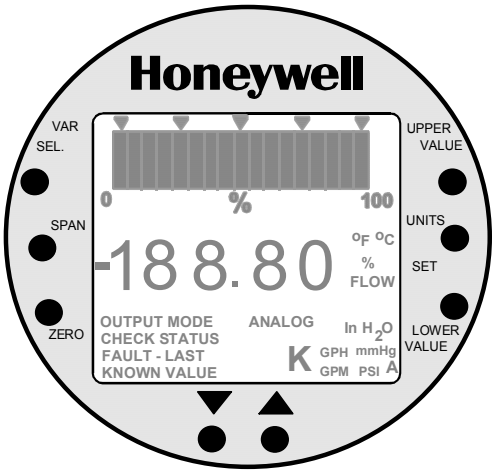


Table A-1 Smart Meter Pushbutton Description

Smart Meter Pushbuttons	Pushbutton	Function
	VAR SEL.	Not functional when installed with ST 3000 transmitters.
	SPAN	Selects Span range setting (URV).
	ZERO	Selects Zero range setting (LRV).
	UPPER VALUE	Selects Upper Range Value setting (URV).
	UNITS SET	Selects engineering units for meter display.
	LOWER VALUE	Selects Lower Range Value (LRV).
	☐	Decrease pushbutton
	☐	Increase pushbutton

A.3 Smart Meter Specifications

Operating Conditions and Specifications

Before installing a transmitter equipped with a smart meter or installing the smart meter in an existing transmitter, please note the specifications and operating limits of the meter in Table A-2.

Table A-2 Smart Meter Specifications.

Operating Conditions			
Parameter		**Rated**	**Extreme, Transportation and Storage (See below)**
Ambient Temperature	°F °C	–40 to 176 –40 to 80	–58 to 194 –50 to 90
Relative Humidity	%RH	10 to 90	0 to 100
Design			
Accuracy		No error. Reproduces transmitter signal exactly within its resolution.	
Display Resolution	Bargraph	±3% of reading	Shown as:
	Digital Readout	±0.005 for ±19.99 reading range, ±0.05 for ±199.9 reading range, ±0.5 for ±1999 reading range, ±5 for ±19990 reading range, ±50 for ±199900 reading range, ±500 for ±1999000 reading range, ±5000 for ±19990000 reading range.	19.99 199.9 1999 19.99 K 199.9 K 1999 K 19990 K
Display Update Rate		Above 32°F (0°C): ½ second @ or below 32°F (0°C): 1½ seconds	

Meter Display at High and Low Temperature Extremes

The rated temperature limits for the meter are listed above and are true in that no damage to the meter will occur over these temperatures, however the readability of the LCD is affected if taken to these temperature extremes:

- The LCD will turn black at some temperature between 80 to 90 °C (176 and 194 °F), rendering the display unreadable. This effect is only temporary, and normally occurs at 90 °C (194 °F).
- At low temperatures, the update rate of the display is lengthened to 1.5 seconds due to the slower response time of the display. At -20 °C (-4 °F) the display becomes unreadable due to slow response of the LCD. This is also only temporary and normal readability will return when temperature returns above -20 °C (-4 °F).

A.4 Setting Range Values (Local Zero and Span)

Local zero and span option

ST 3000 Release 300 transmitters are available with optional local zero and span adjustments. This option is for applications that do not require an SFC nor digital integration with our TPS system.

About local adjustments

You must apply equivalent zero and span pressures to make the local zero and span adjustments. This is similar to setting the LRV and URV to applied pressures using the SFC.

ATTENTION

After making any adjustments to the smart meter, keep the transmitter powered for at least 30 seconds so that the new meter configuration is written to non-volatile memory. If power is turned off before 30 seconds, the changes may not be saved so that when the transmitter power is restored, the meter configuration will revert to the previous settings.

Procedure

The procedure in Table A-3 shows the steps for setting the range values to applied pressures using local zero and span adjustments. See Figure A-2 for typical local adjustment setup details.

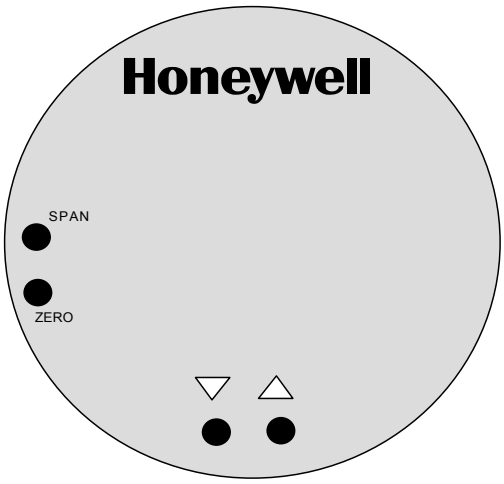
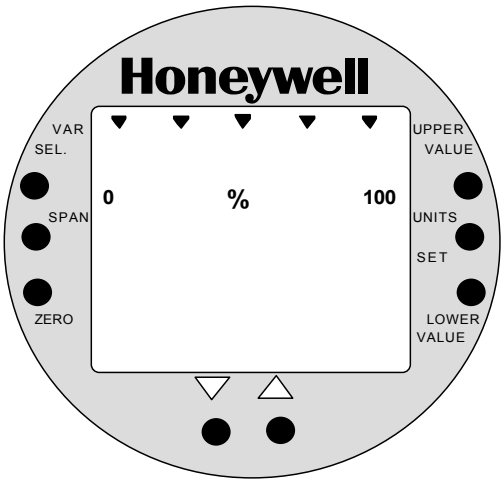
Table A-3 Setting Range Values Using Local Zero and Span Adjustments

Step	Action
1	Turn OFF transmitter power. Loosen end-cap lock and remove end-cap from terminal block side of electronics housing.
2	Observing polarity, connect a milliammeter across positive (+) and negative (–) TEST terminals. **ATTENTION** If you have the smart meter with local zero and span adjustment option, you may use the Smart Meter in place of the milliammeter.

Continued on next page

Procedure, continued

Table A-3 Setting Range Values Using Local Zero and Span Adjustments, Continued

Step	Action
3	Loosen end-cap lock and remove end-cap from PWA side of electronics housing to expose local zero and span assembly or smart meter with zero and span adjustments. Example – Local zero and span assembly.  Example – Smart meter with zero and span adjustments. 

Continued on next page

Procedure, continued

Table A-3 Setting Range Values Using Local Zero and Span Adjustments, Continued

Step	Action
4	Turn ON transmitter power and let it warm up for a few minutes. Using an accurate pressure source, apply desired zero equivalent pressure to transmitter. **ATTENTION** For differential pressure transmitters, apply pressure to the high pressure head for positive range values or vent both heads to atmosphere for zero. If zero is to equal a negative value, apply the equivalent pressure to the low pressure head. For example, if zero is to equal –10 inH_2O, you would apply 10 inH_2O to the low pressure head and vent the high pressure head for the zero adjustment.
5	Check that milliammeter reading is 4 mA. **If reading …** / **Then…** is less or greater than 4 mA / go to Step 6. is correct / go to Step 7. **ATTENTION** If you have the smart meter with local zero and span adjustment option, you may substitute the smart meter readings for the milliammeter readings. For example, with zero input pressure applied assume that the meter reads 4 inH2O instead of 0 inH2O. In this case, the meter reading is greater than 0 (or 4 mA).
6	a. Press and hold ZERO button on local zero and span assembly or smart meter. **ATTENTION** The smart meter readings revert to the default unit of percent (%) during this operation. If the error code `Er0` appears on the display, you are working with a model STD110 transmitter that does not support the local zero and span adjustments. b. Press Decrease ☐ button once to complete this function. **ATTENTION** The smart meter display goes blank for a 1/2 second and then returns reading 0%. c. Check that milliammeter reading equals 4 mA and release ZERO button. **ATTENTION** If milliammeter reading doesn't change, be sure you are not working with a model STD110 transmitter that ignores local adjustments. The smart meter readings return to the set engineering units after you release the ZERO button.

Continued on next page

Procedure, continued

Table A-3 Setting Range Values Using Local Zero and Span Adjustments, Continued

Step	Action
7	Using an accurate pressure source, apply pressure equivalent to desired upper range value to transmitter. **ATTENTION** For differential pressure transmitters, apply pressure to the high pressure head and be sure that the pressure to the low pressure head is at its reference value.
8	Check that milliammeter reading is 20 mA. **If reading …** / **Then…** is not exactly 20 mA / go to Step 9. is correct / go to Step 10. **ATTENTION** If you have the smart meter with local zero and span adjustment option, you may substitute the smart meter readings for the milliammeter readings. For example, with URV input pressure applied assume that the meter reads 396 inH2O instead of 400 inH2O. In this case, the meter reading is less than 100% (or 20 mA).
9	a. Press and hold SPAN button on local zero and span assembly or smart meter. **ATTENTION** The smart meter readings revert to the default unit of percent (%) during this operation. If the error code `Er0` appears on the display, you are working with a model STD110 transmitter that does not support the local zero and span adjustments. If the error code `Er4` appears, you are trying to set a SPAN value that is outside acceptable limits for your transmitter. Readjust applied pressure to be within acceptable range limits and repeat this procedure. b. Press Increase ☐ button once to complete this function. **ATTENTION** The smart meter display goes blank for a 1/2 second and then returns reading 100%. c. Check that milliammeter reading equals 20 mA and release SPAN button. **ATTENTION** If milliammeter reading doesn't change, be sure you are not working with a model STD110 transmitter that ignores local adjustments. The smart meter readings return to the set engineering units after you release the SPAN button.

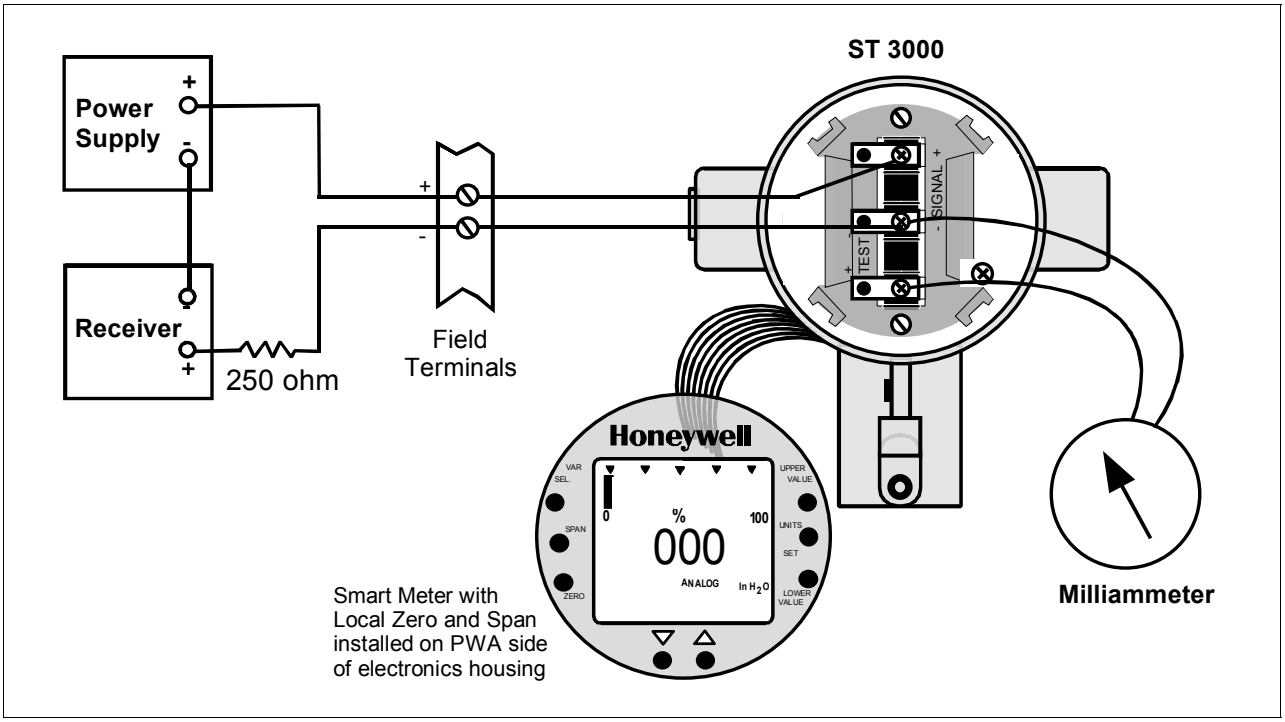
Continued on next page

Procedure, continued

Table A-3 Setting Range Values Using Local Zero and Span Adjustments, Continued

Step	Action
10	Wait 30 seconds so that changes have been copied to the transmitter's non-volatile memory.
11	Remove applied pressure and turn OFF transmitter power.
12	Replace end-cap on PWA side of electronics housing and tighten lock.
13	Remove milliammeter from TEST terminals and replace end-cap and tighten lock.
14	Turn ON transmitter power and check smart meter reading, if applicable.

Figure A-2 Typical Setup for Setting Range Values Using Local Zero and Span Adjustments.



A.5 Configuring Smart Meter Using Pushbuttons

Using Pushbuttons on Meter to Configure Smart Meter Display

The smart meter can be set to show the PV out in engineering units that are appropriate for your process application. You can select an available engineering unit or enter a custom one including upper and lower display limit settings for the smart meter's digital readout using buttons on the face of the meter.

Using the Smart Meter

Follow these guidelines when configuring the smart meter:

- If you initiate an SFC command at the same time a button is pressed on the smart meter, the smart meter will respond to the command it receives last. In other words, the last command wins.
- In most cases, you can press and release a button for one-shot operation, or press and hold a button for continuous, 1/2 second, repetitive operation.
- Active setup field will begin to flash at one second rate if next action is not initiated within one second. And, if no action is taken within 30 seconds, the setup function will time out and the meter will return to its previous state.

Transmitter Output Conformity and Smart Meter Configuration

Normally when using a differential type transmitter, you can select the transmitter's output to represent a straight linear calculation or a square root calculation for flow measurement applications. This linear or square root output parameter selection is called output conformity or output form. (See ST 3000 User Manual for more details.)

When configuring the smart meter to display the transmitter output measurement, there are certain rules to keep in mind which are dependent on the output conformity selection. These rules are described in the following paragraphs.

1. The output conformity setting of the transmitter restricts the engineering units you can select for the smart meter display.
   - When the transmitter is configured for an output conformity of **LINEAR**, you can select only pressure type engineering units. (See Table A-4.)
   - When the transmitter is configured for an output conformity of **SQUARE ROOT**, you can select only flow type engineering units GPM and GPH.
   - The percent and custom engineering units can be selected regardless of output conformity configuration.

2. Additionally, the output conformity setting restricts the setting of the lower and upper display limits to represent transmitter's 0 to 100% output.

Continued on next page

Transmitter Output Conformity and Smart Meter Configuration, continued

- If you select pressure type engineering units, you cannot set the lower or upper display limits. These values are automatically set when you select the engineering units.
- You can set only the upper display limit when the transmitter is configured for **SQUARE ROOT** output conformity. The lower display limit is fixed at zero (0) for a transmitter in square root mode and cannot be changed.
- You can set both the lower and upper display limits when you have selected custom engineering units (EUF) and the transmitter output conformity is set to **LINEAR**.

When setting the lower and upper display limits, if you let either the lower or upper display limit setting time out (after thirty seconds), the meter will discard the newly set values and will revert to its previous settings. The meter forces you to set both limits by automatically initiating the next limit setting, either lower or upper, depending upon which limit you set first.

3. If you change the transmitter's output conformity, you must reconfigure the smart meter as outlined in Tables A-5, A-7 and A-8.

Table A-4 Smart Meter Engineering Units Code

Smart Meter Code	Engineering Unit		Transmitter Output Conformity
EU0	%	*	Linear or Square Root
EU1	in H_2O	*	Linear
EU2	mmHg	*	
EU3	PSI	*	
EU4	kPa	†	
EU5	MPa	†	
EU6	mbar	†	
EU7	bar	†	
EU8	g/cm^2	†	
EU9	kg/cm^2	†	
EUA	mmH_2O	†	
EUB	inHg	†	
EUC	mH_2O	†	
EUD	GPM	*	Square Root
EUE	GPH	*	Square Root
EUF	Custom	†	Linear or Square Root

* These selections have indicators on smart meter display.
† Use stick-on labels provided for other engineering units.

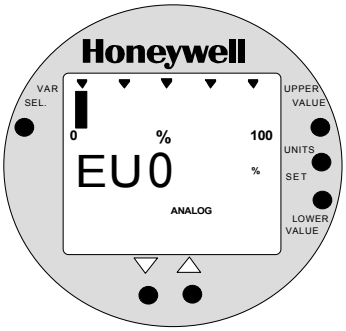
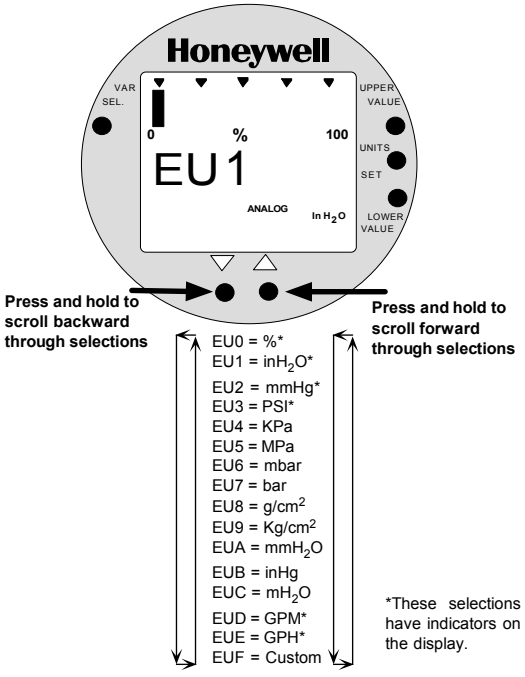
Selecting Engineering Units

The procedure in Table A-5 outlines the steps for selecting the desired engineering units for a smart meter using its local adjustments on the face of the meter. **You will be selecting the unit of measurement that you want the smart meter to indicate during normal operation.**

WARNING

When the transmitter's end-cap is removed, the housing is not explosionproof.

Table A-5 Selecting Engineering Units

Step	Action	Meter Display
1	Loosen lock on meter end-cap and unscrew cap from housing. Be sure transmitter power is ON.	
2	Press UNITS SET button.	Display shows code for current engineering units setting. 
3	Press Increase ☐ key to call up next code or Decrease ☐ key to call up previous code. Repeat this action until desired code is on display. You can hold down the Increase or Decrease key to scroll forward or backward through the codes. **ATTENTION** Remember that if transmitter is configured for SQUARE ROOT output conformity the only valid code selections are `EU0` (%) `EUD` (GPM) `EUE` (GPH) `EUF` (Custom) If transmitter is configured for LINEAR output conformity `EU0` (%) to `EUC` and `EUF` (CUSTOM) are valid code selections.	Selection codes for engineering units 

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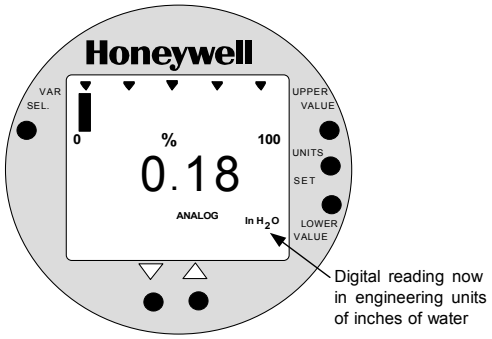
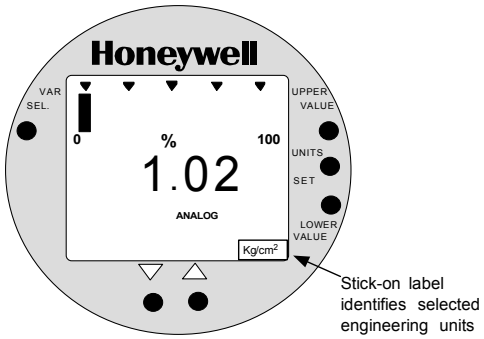
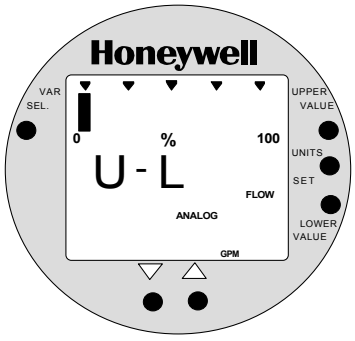
Selecting Engineering Units, continued

Table A-5 Selecting Engineering Units, continued

Step	Action	Meter Display
4	Press UNITS SET button to lock in selected code. **ATTENTION** If you select an invalid code according to the selections in Step 3, the meter display will show an error code `Er1` for one second and then return to the previous engineering units selection. Goes blank for 1/2 second and returns with reading in engineering units.	
5	If selected engineering unit does not match one of six unit indicators on meter, peel off matching stick-on unit label from sheet (drawing number 30756918-001) and paste it in lower right hand corner of meter.	Use stick-on label for engineering units without indicators on display. 
6	If you selected Custom or Flow engineering units, go to Tables A-7 and A-8 to set lower and upper display limits for smart meter display.	Lower and upper display limits have not been set for Custom or Flow engineering units. 

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Setting Lower and Upper Display Values

The Table A-6 shows the restrictions on setting the display values for given engineering units and output conformity selections.

Table A-6 Smart Meter Restrictions for Setting Display Values

Engineering Units code	Output Conformity	Set Lower Display Value?	Set Upper Display Value?
EU0 through EUC (Pressure type units)	Linear	No (set automatically)	No (set automatically)
EU0, EUD, EUE,and EUF (%, GPM, GPH, or Custom)	Square root	No (fixed at zero)	Yes Use Table A-8
EUF (Custom)	Linear	Yes Use Table A-7	Yes Use Table A-8

Setting Lower and Upper Display Values

To set the lower and upper display limit values for the meter display perform the procedures in Tables A-7 and A-8. Also note that in each procedure you must:

- First set the **magnitude range** for each display value. This enables the multiplier (K) on the display for indicating larger ranges (greater than 19999 and shifts the decimal point of the digital display left or right depending on the precision you want to show for that value).
- Next set the **display value**. This procedure sets the display limit of the meter to represent minimum and maximim transmitter output (0% and 100 % output).

Note: Magnitude range and display values are set for both upper and lower (if applicable) display limits.

During normal operation, the display range of the meter digital readout is ±19,990,000 and is automatically ranged to provide the best precision possible for the digits available up to 1/100th of a unit.

Setting Lower Display Values

The procedure in Table A-7 outlines the steps for setting the lower display limit to represent the 0 percent (LRV) output of the transmitter.

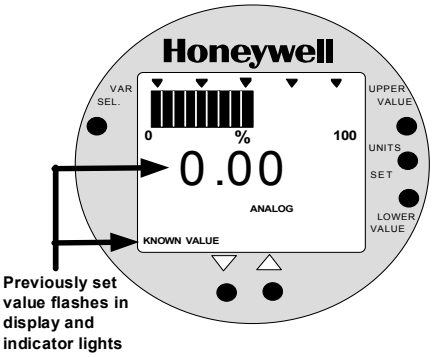
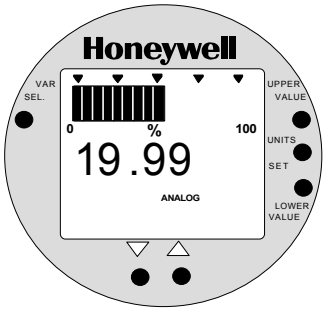
ATTENTION

For example purposes, the procedures in Tables A-7 and A-8 assume that the lower value is to be set at 0 and the upper value is to be set at 19,990,000 for a CUSTOM unit in a transmitter with a LINEAR output, and the transmitter's present output is exactly 50 percent.

Continued on next page

Setting Lower Display Values, continued

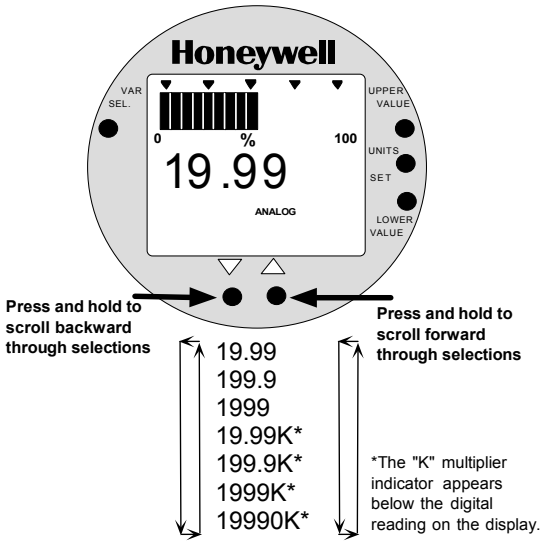
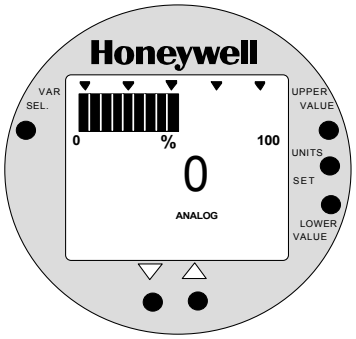
Table A-7 Setting Lower Display Values for Smart Meter Display

Step	Action	Meter Display
1	You have completed units selection in Table A-5 and U-L appears on the display. Press LOWER VALUE button to initiate lower display limit setting function. **ATTENTION** This procedure is only applicable for Custom (EUF) engineering unit selection in a transmitter configured for LINEAR output conformity. The lower display value for transmitters configured for SQUARE ROOT output conformity is fixed at zero (0.00) and cannot be changed.	If lower limit display value was previously set, KNOWN VALUE indicator lights and set value flashes in display. 
2	Press LOWER VALUE button again within 5 seconds. Otherwise, meter exits limit setting function.	Display shows magnitude range selection.  **ATTENTION** The magnitude range selection only applies for setting the display limits. This selection does not affect the normal operation of the meter. During normal operation, the display is automatically ranged to provide the best precision possible.

Continued on next page

Setting Lower Display Values, continued

Table A-7 Setting Lower Display Values for Smart Meter Display, continued

Step	Action	Meter Display
3	Press Increase ☐ button to call up next available magnitude range selection or Decrease ☐ button to call up previous magnitude range selection. NOTE: This action enables the multiplier (K) for indicating larger ranges and shifts the decimal point of the digital display left or right depending on which button is pushed. The display shows largest positive number for given range selection so you can select a range that is just larger than the range to be set for best display precision. Hold respective key to scroll forward or backward through the selections. Repeat this action until desired selection is on display.	Magnitude range selections. 
4	Press LOWER VALUE button to initiate lower value setting.	Readout goes blank except for first active digit which will be 0 unless lower value was set before. 

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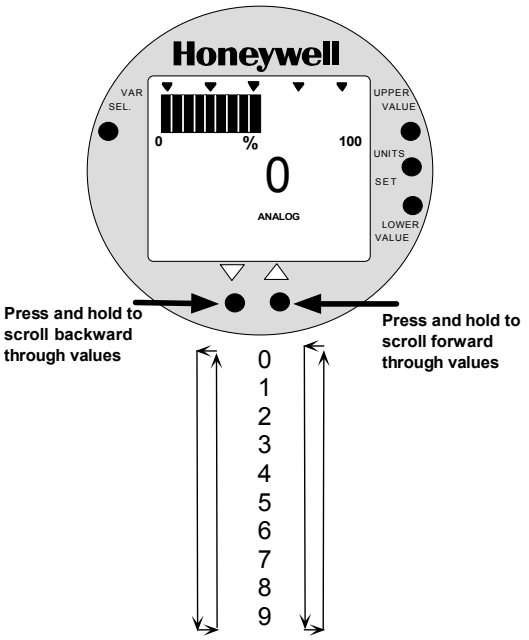
Setting lower display values, continued

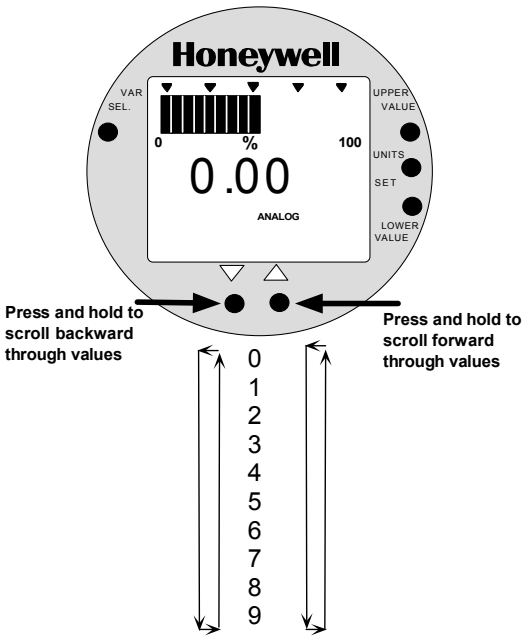
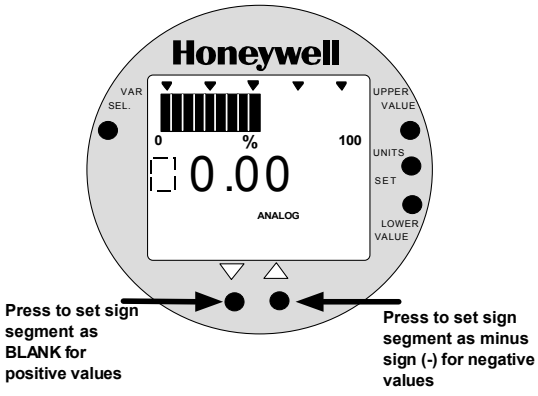
Table A-7 Setting Lower Display Values for Smart Meter Display, continued

Step	Action	Meter Display
5	Press Increase ☐ button to select the next available digit value or Decrease ☐ button to select the previous digit value. Repeat this action until desired value is on display.	First digit value setting. 
6	Press LOWER VALUE button to lock-in first digit and activate next active digit. Readout now displays next active digit which will be zero unless lower value was set before.	
7	Press Increase ☐ button to select the next available digit value or Decrease ☐ button to select the previous digit value. Repeat this action until desired value is on display.	
8	Press LOWER VALUE button to lock-in second digit and activate next active digit. Readout now displays next active digit which will be zero unless lower value was set before.	

Continued on next page

Setting lower display values, continued

Table A-7 Setting Lower Display Values for Smart Meter Display, continued

Step	Action	Meter Display
9	Press Increase ☐ button to select the next available digit value or Decrease ☐ button to select the previous digit value. Repeat this action until desired value is on display.	Third digit value setting. 
10	Press LOWER VALUE button to lock-in third digit and activate next active digit. Readout now displays next active digit which will be BLANK unless lower value was set to 1 before.	
11	Press Increase ☐ button to set digit to 1 or Decrease ☐ button to set it to BLANK..	
12	Press LOWER VALUE button to lock-in "1" digit and activate sign segment. Readout now displays sign segment which will be BLANK for positive values unless lower value was set for negative (–) values before.	
13	Press Increase ☐ button to set sign segment to minus sign for negative values or Decrease ☐ button to set it to BLANK. for positive values.	Sign segment setting. 
14	Press LOWER VALUE button to lock in current settings as lower display value limit. **ATTENTION** For CUSTOM unit in transmitter with LINEAR output, you must set both lower and upper display limits for values to take effect. If you let either the lower or upper display limit time out (after 30 seconds), the meter discards both newly set values and reverts back to the previously set values.	

- If you have not yet set the upper display limit value, the meter automatically enters the upper display setting function after it displays previously set value, if applicable. Go to Table A-8.
- If you have already set the upper display limit value, this completes the lower and upper display limits setting function for Custom engineering units in the transmitter. Meter returns to normal operation.

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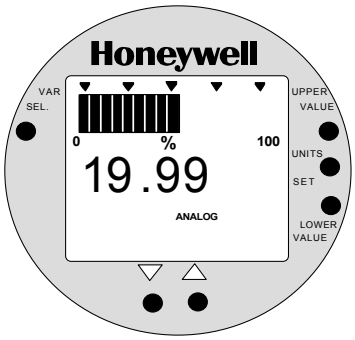
Setting Upper Display Values

The procedure in Table A-8 outlines the steps for setting the upper display limit to represent the 100 percent (URV) output of the transmitter.

ATTENTION

This procedure applies only for Flow units (GPM or GPH) in a transmitter configured for SQUARE ROOT output conformity, or CUSTOM unit in a transmitter configured for linear or square root output conformity.

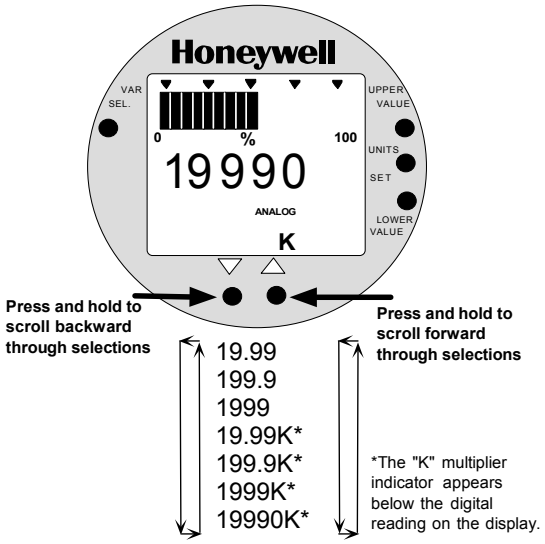
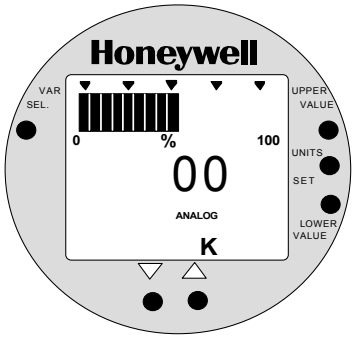
Table A-8 Setting Upper Display Value for Smart Meter Display

Step	Action	Meter Display
1	Press UPPER VALUE button to initiate upper display limit setting function.	If upper limit display value was previously set, KNOWN VALUE indicator lights and set value flashes in display.
2	Press UPPER VALUE button again within 5 seconds. Otherwise, meter exits limit setting function.	Display shows magnitude range selection.  **ATTENTION** The magnitude range selection only applies for setting the display limits. This selection does not affect the normal operation of the meter. During normal operation, the display is automatically ranged to provide the best precision possible.

Continued on next page

Setting Upper Display Values, continued

Table A-8 Setting Upper Display Value for Smart Meter Display, continued

Step	Action	Meter Display
3	Press Increase ☐ button to call up next available magnitude range selection or Decrease ☐ button to call up previous magnitude range selection. NOTE: This action enables the multiplier (K) for indicating larger ranges and shifts the decimal point of the digital display left or right depending on which button is pushed. The display shows largest positive number for given range selection so you can select a range that is just larger than the range to be set for best display precision. Hold respective key to scroll forward or backward through the selections. Repeat this action until desired selection is on display. For example purposes only, largest range 19990K is selected in this procedure.	Magnitude range selections with largest range selected. 
4	Press UPPER VALUE button to initiate upper value setting.	Readout goes blank except for first active digit which will be 0 unless upper value was set before. 

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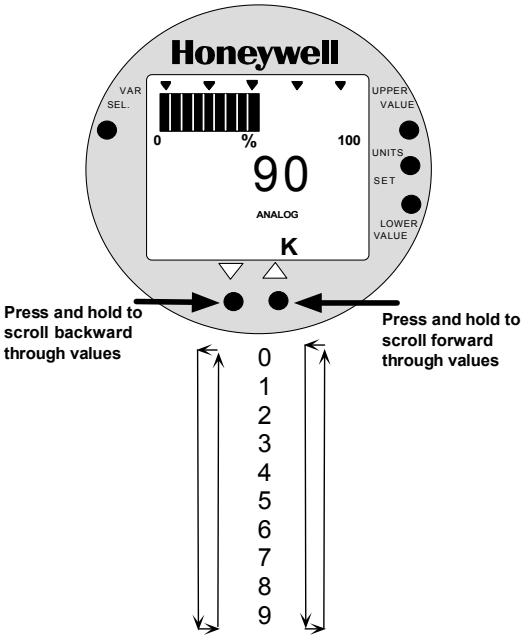
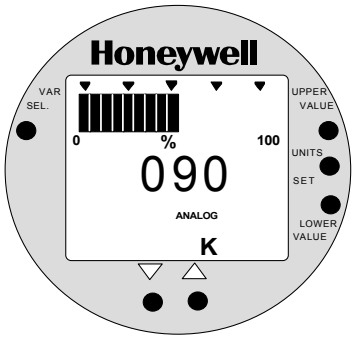
Setting Upper Display Values, continued

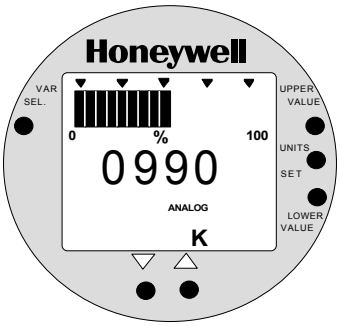
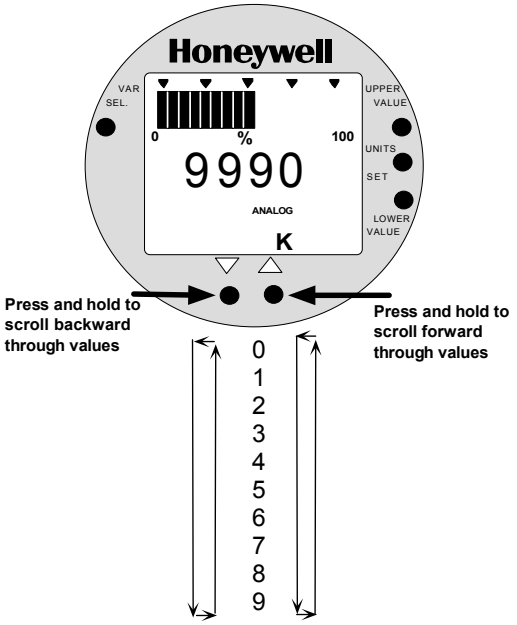
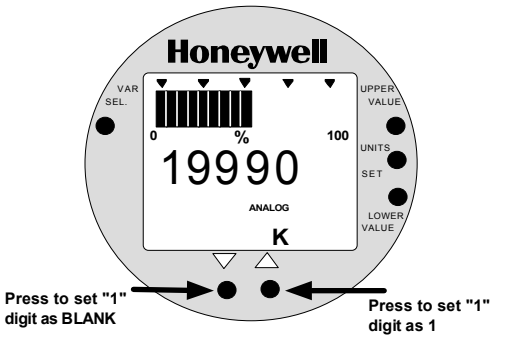
Table A-8 Setting Upper Display Value for Smart Meter Display, continued

Step	Action	Meter Display
5	Press Increase ☐ button to select the next available digit value or Decrease ☐ button to select the previous digit value. Repeat this action until desired value is on display – use 9 for example purposes.	First digit value setting is set to 9. 
6	Press UPPER VALUE button to lock-in first digit and activate next active digit. Readout now displays next active digit which will be zero unless upper value was set before.	
7	Press Increase ☐ button to select the next available digit value or Decrease ☐ button to select the previous digit value. Repeat this action until desired value is on display.	

Continued on next page

Setting Upper Display Values, continued

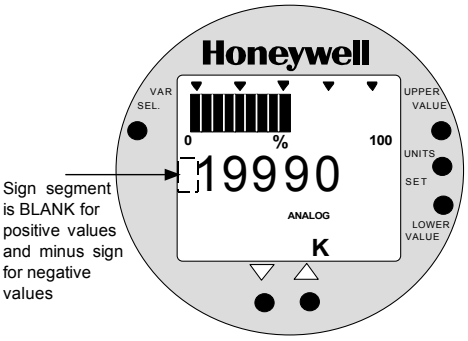
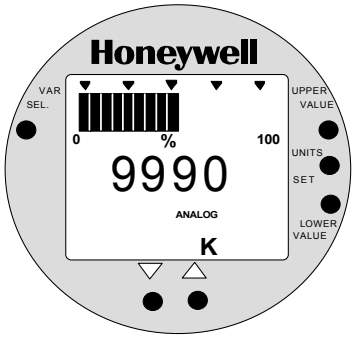
Table A-8 Setting Upper Display Value for Smart Meter Display, continued

Step	Action	Meter Display
8	Press UPPER VALUE button to lock-in second digit and activate next active digit. Readout now displays next active digit which will be zero unless upper value was set before.	
9	Press Increase ☐ button to select the next available digit value or Decrease ☐ button to select the previous digit value. Repeat this action until desired value is on display – use 9 for example purposes.	Next digit value setting is set to 9. 
10	Press UPPER VALUE button to lock-in third digit and activate next active digit. Readout now displays next active digit which will be BLANK unless upper value was set to 1 before.	
11	Press Increase ☐ button to set digit to 1 or Decrease ☐ button to set it to BLANK.	"1" digit value setting is set to 1. 

Continued on next page

Setting Upper Display Values, continued

Table A-8 Setting Upper Display Value for Smart Meter Display, continued

Step	Action	Meter Display
12	Press UPPER VALUE button to lock-in "1" digit and activate sign segment.	Readout now displays sign segment which will be BLANK for positive values unless upper value was set for negative (–) values before.
13	Press Increase ☐ button to set sign segment to minus sign for negative values or Decrease ☐ button to set it to BLANK. for positive values.	
14	Press UPPER VALUE button to lock in current settings as upper display value and return to previous display. Upper display limit setting is now complete. **ATTENTION** For CUSTOM unit in transmitter with LINEAR output, you must set both lower and upper display limits for values to take effect. If you let either the lower or upper display limit time out (after 30 seconds), the meter discards both newly set values and reverts back to the previously set values.	Display goes blank for a 1/2 second and returns to display readout equal to 50% output. In this example, readout is 9, 990,000 CUSTOM unit for 50% display range of 0 to 19,990,000 CUSTOM for transmitter with LINEAR output. 

- If you have not yet set the lower display limit value for CUSTOM unit in a transmitter configured for LINEAR output mode, the meter automatically enters the lower display setting function after it displays previously set value, if applicable. Go to Table A-7, Step 3.
- If you have already set the lower display limit value, this completes the lower and upper display limits setting function for CUSTOM unit in a transmitter configured for LINEAR output mode. Meter returns to normal operation.
- If you have just set the upper display limit for Flow unit or CUSTOM unit in a transmitter configured for SQUARE ROOT output mode, this completes the limit setting function. Meter returns to normal operation.

A.6 Configuring Smart Meter Using SFC

Using the SFC to Configure the Smart Meter Display

You can select an available engineering unit or enter a custom one including upper and lower limit settings for the smart meter's digital readout using the SFC.

Transmitter Output Conformity and Smart Meter Configuration

Normally when using a differential type transmitter, you can select the transmitter's output to represent a straight linear calculation or a square root calculation for flow measurement applications. This linear or square root output parameter selection is called output conformity or output form. (See ST 3000 User manual for more details.)

When configuring the smart meter to display the transmitter output measurement, there are certain rules to keep in mind which are dependent on the output conformity selection. These rules are described in the following paragraphs.

1. The output conformity setting of the transmitter restricts the engineering units you can select for the smart meter display.
   - When the transmitter is configured for an output conformity of **LINEAR**, you can select only pressure type engineering units. (See Table 6.)
   - When the transmitter is configured for an output conformity of **SQUARE ROOT**, you can select only flow type engineering units GPM and GPH.
   - The percent and custom engineering units can be selected regardless of output conformity configuration.

2. Additionally, the output conformity setting restricts the setting of the lower and upper display limits to represent transmitter's 0 to 100% output.
   - If you select pressure type engineering units, you cannot set the lower or upper display limits. These values are automatically set when you select the engineering units.
   - You can set only the upper display limit when the transmitter is configured for **SQUARE ROOT** output conformity. The lower display limit is fixed at zero (0) for a transmitter in square root mode and cannot be changed.

Continued on next page

Transmitter Output Conformity and Smart Meter Configuration, continued

- You can set both the lower and upper display limits when you have selected custom engineering units (Custom) and the transmitter output conformity is set to **LINEAR**.
  When setting the lower and upper display limits, if you let either the lower or upper display limit setting time out (after thirty seconds), the meter will discard the newly set values and will revert to its previous settings. The meter forces you to set both limits by automatically initiating the next limit setting, either lower or upper, depending upon which limit you set first.

3. If you change the transmitter's output conformity, you must reconfigure the smart meter as outlined in Table A-9.

ATTENTION

After making any adjustments to the smart meter, keep the transmitter powered for at least 30 seconds so that the new meter configuration is written to non-volatile memory. If power is turned off before 30 seconds, the changes may not be saved so that when the transmitter power is restored, the meter configuration will revert to the previous settings.

Procedure

The procedure in Table A-9 outlines the steps for setting up the configuration for a smart meter using an SFC.

Table A-9 Setting Up Smart Meter Configuration Using an SFC

Step	Press Key	Read Display or Action	Description
1	B CONF	ST CONFIG CONFORMITY?	Calls up first configuration prompt.
2	H ▲ NEXT	ST CONFIG Meter Config?	Calls up next configuration prompt. Prompt asks if you want to access meter configuration function. If you want to access it, go to Step 3. If you do not want to access it, press [**CLR**] key to exit function or [**▲ NEXT**] key to call up next configuration parameter.

Continued on next page

Procedure, continued

Table A-9 Setting Up Smart Meter Configuration Using an SFC, continued

Step	Press Key	Read Display or Action	Description
3	NON-VOL ENTER (YES)	Meter Config SFC WORKING... Meter Config Meter Bd Present	Enters meter configuration function and confirms that smart meter is present. Timed prompt - Proceed to Step 4. **ATTENTION** If prompt "No Meter Present" appears, prompt times out in a few seconds, as described above, and calls up the Configure Meter? prompt. This means that you can access the meter configuration function without the smart meter installed. Proceed to Step 4. If prompt "Mtr not Supportd" appears, prompt times out and returns to previous ST CONFIG prompt (See Step 2.). This means that you are working with a pre-release 300 transmitter that does not support the smart meter option and, therefore, can not access the meter configuration function.
4		Meter Config Configure Meter?	Prompt asks if you want to configure Smart Meter. If you want to configure it, go to Step 5. If you do not want to configure it, press **[CLR]** key to exit function.

Continued on next page

Procedure, continued

Table A-9 Setting Up Smart Meter Configuration Using an SFC, continued

Step	Press Key	Read Display or Action	Description
5	NON-VOL ENTER (YES) DECONF I MENU ITEM	Meter Engng Units "H2O_39F MmHg_0C PSI KPa MPa mBAR BAR g/cm^2 Kg/cm^2 mmH2O_4C inHg_32F mH2O_4C GPM GPH Custom %	Calls up present meter Engineering Unit selection. (Note that unit "H2O_39F is shown for example purposes only.) Repeatedly press [**MENU ITEM**] key to step through other selections. For example purposes, stop when PSI unit is on display.
6		**If EU is …** / **Then…** Custom, GPM, or GPH — go to Step 7. other than Custom, GPM, or GPH — go to Step 13.	

Continued on next page

Procedure, continued

Table A-9 Setting Up Smart Meter Configuration Using an SFC, continued

Step	Press Key	Read Display or Action	Description
7	NON-VOL ENTER (YES)	Meter Eng Units SFC WORKING. . . Meter Eng Units Data Downloaded Eng Units Hi-Lo SFC WORKING. . . EU Hi Custom >RANGE	Selected engineering unit is downloaded to transmitter and high/low display limit setting function is initiated. (Note that Custom unit is shown for example purposes only.) **ATTENTION** If you select GPM or GPH unit with the transmitter in its LINEAR mode, the prompts "INVALID REQUEST", "Download Error", and "MtrNotInFlowMode" are sequentially displayed after the SFC WORKING. . . prompt and display returns to the Configure Meter prompt. Transmitter must be in its SQUARE ROOT (Flow) mode for GPM or GPH to be a valid unit selection. Press [☐ **PREV**] key , if you want to view present high and low display limits loaded in the transmitter.
8	S 5 W 2 S 5	EU Hi Custom 5_ EU Hi Custom 52_ EU Hi Custom 525_	Key in 525 as upper display limit for Custom unit. **ATTENTION** The display range of the meter is ±19,990,000. If you enter larger values, they will not be displayed.
9	NON-VOL ENTER (YES)	EU Hi Custom ENTERED IN SFC EU Lo Custom >RANGE	Enters upper display limit in SFC and calls up lower display limit setting.
10	+/– S 5	EU Lo Custom -_ EU Lo Custom -5_	Key in –5 as lower display limit for Custom unit in transmitter configured for LINEAR output mode. (Note that lower limit value is referenced to configured LRV.) **ATTENTION** Zero (0) is only valid entry for GPM or GPH unit, or CUSTOM unit with transmitter in SQUARE ROOT output mode.

Continued on next page

A.6 Configuring Smart Meter Using SFC, Continued

Procedure, continued

Table A-9 Setting Up Smart Meter Configuration Using an SFC, continued

Step	Press Key	Read Display or Action	Description
11	NON-VOL ENTER (YES)	EU Lo Custom ENTERED IN SFC Eng Units Hi-Lo ENTER CHANGES?	Enters lower display limit in SFC and prompt asks if you want to enter changes in transmitter. If you want to enter changes, go to Step 12. If you do not want to enter changes, press [**CLR**] key to exit function.
12	NON-VOL ENTER (YES)	Eng Units Hi-Lo SFC WORKING... Eng Units Hi-Lo Data Downloaded Meter Config Configure Meter?	Downloads changes to transmitter and returns to Configure Meter? prompt. Press [**CLR**] key to return to ST CONFIG menu. Skip Step 13.
13	NON-VOL ENTER (YES)	Meter Eng Units SFC WORKING... Meter Eng Units Data Downloaded Meter Eng Units MtrNotInFlowMode Meter Config Configure Meter?	Downloads selected pressure engineering unit to transmitter. Press [**CLR**] key to return to ST CONFIG menu. **ATTENTION** If you select a pressure unit with the transmitter in its SQUARE ROOT (Flow) mode, the prompts “INVALID REQUEST” and “Download Error” are sequentially displayed after the SFC WORKING. . . prompt and the EU Hi prompt is called up for display. At this point, you can change the upper display limit as shown in Step 8 or press the [☐ **NEXT**] key to call up the EU Lo prompt. See Step 10 to change the lower display limit or press the [☐ **NEXT**] key and then the [**CLR**] key to exit the function.
14		If you selected one of these engineering units: %, inH2O, mmHg, PSI, GPM, or GPH; verify that corresponding unit indicator is lit on Smart Meter display.	If selected engineering unit does not match one of six unit indicators on meter, you can use a stick-on label from Honeywell drawing 30756918-001. Just peel off matching engineering unit label from drawing and carefully paste it in lower right hand corner of display.

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A.7 Configuring Smart Meter Using SCT 3000

Using the SCT to Configure Smart Meter Display

You can select an available engineering unit or enter a custom one including upper and lower limit settings for the smart meter's digital readout using the SCT 3000.

To configure the smart meter using the SCT, click on the *Local Meter* tab in the ST 3000 device window. Use the information fields on the tab to select and enter the engineering unit and lower and upper display limits, if applicable. Refer to the SCT on-line User Manual for more information on smart meter set up using the SCT.

ATTENTION

The same rules apply for meter set up and the transmitter's output conformity selection. See "Transmitter Output Conformity and Smart Meter Configuration" in Subsection A.6 for details and restrictions.

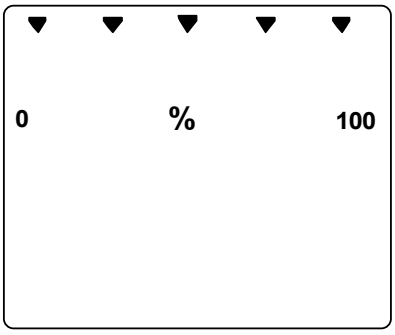
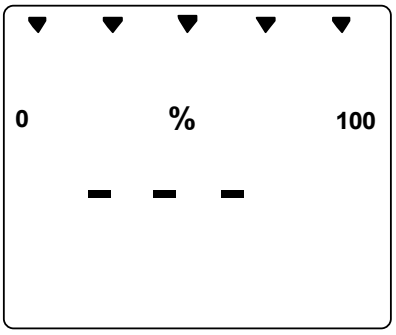
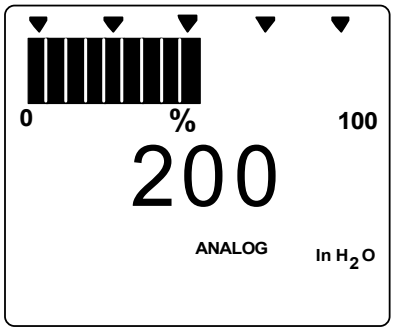
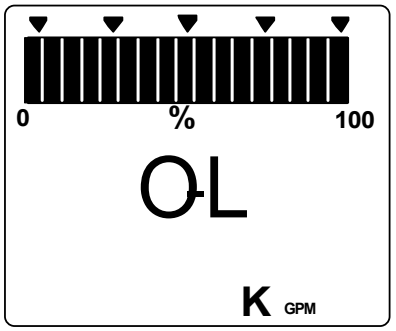
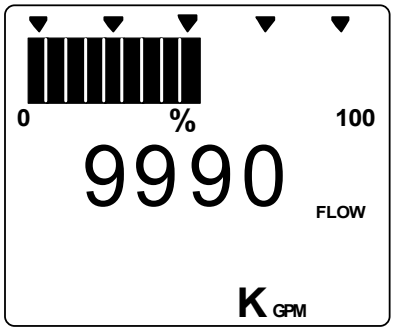
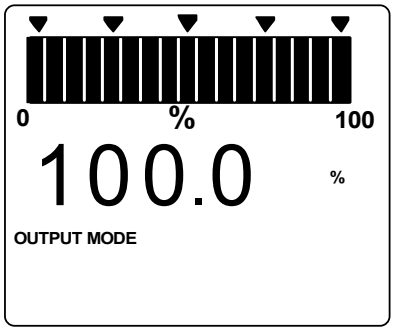
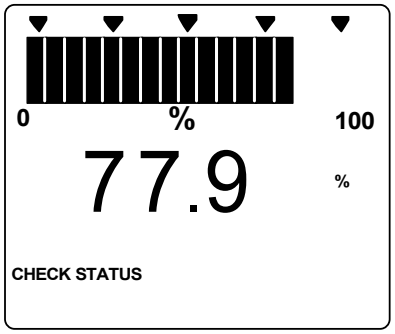
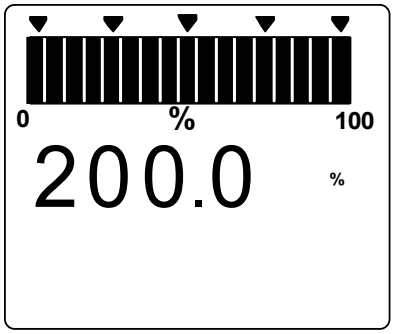
The smart meter does **not** have to be installed for you to configure it through the SCT.

A.8 Typical Smart Meter Indications

Typical operation indications

Table A-10 summarizes typical smart indications. meter Note that other combinations of status messages are possible.

Table A-10 Summary of Typical Smart Meter Indications.

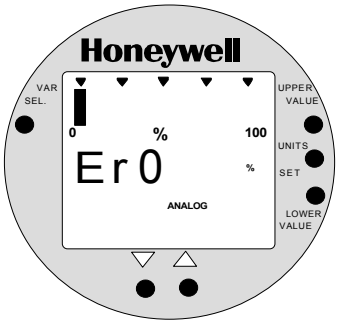
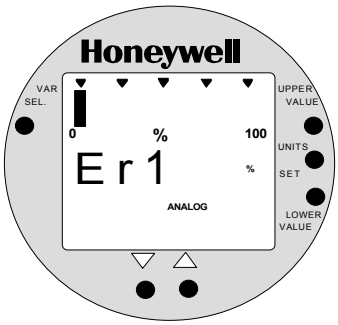
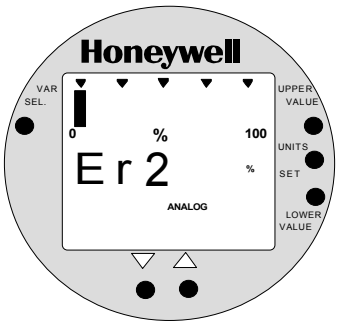
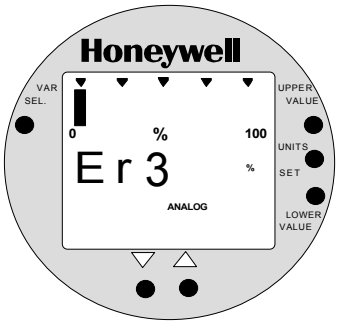
Meter Indication	What It Means	Meter Indication	What It Means
	No power applied.		Meter has detected transmitter output that is not-a-number.
	Normal display for transmitter in Analog mode with digital readout in inches of water.		Display range is Over Limit. Upper value is 19,990,000 and transmitter output is over 100%.
	Normal display for transmitter in DE mode and square root output. Digital readout is gallons per minute with 1000 multiplier.		Transmitter is in output mode. Bargraph and readout show value that was entered through SCT or SFC.
	Transmitter in DE mode is in non-critical status. Displayed value may not be valid. If display is "- - -" instead of a value, transmitter is in critical status.		Input pressure equal to or greater than 200%. Display flashes between 200% (or twice current URV in EU) and O-L. Transmitter locks output at 200% and will go no higher regardless of input.

Continued on next page

A.8 Typical Smart Meter Indications, Continued

Operation error codes Table A-11 identifies possible meter error codes and what they mean.

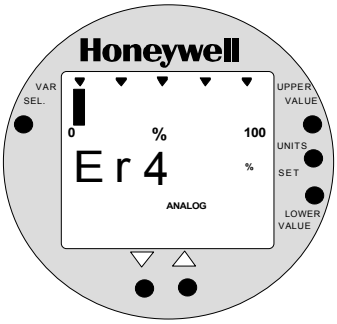
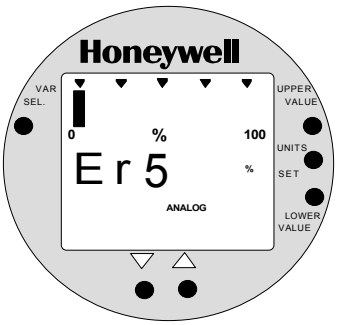
Table A-11 Smart Meter Error Codes and Descriptions.

If error indication is . . .	Then, it means
	You have tried to set local Zero or Span adjustment in a Series 100 transmitter that does not support this option.
	You have tried to set a pressure type engineering unit for a transmitter in SQUARE ROOT mode (FLOW) or have tried to set a flow type engineering unit for a transmitter in LINEAR mode (pressure). After this error is displayed, the meter will return to the unit # (EU#) of the Engineering Unit it was displaying before the set function was invoked. You may then select another unit or exit in the normal fashion.
	You have tried to select a process variable for the transmitter using the VAR SEL. button. The Variable Select button is non-functioning on the ST 3000 R300 transmitter.
	You have tried to set Lower or Upper display limit for pressure type engineering units (EU1 to EUC), or Lower display limit for flow type engineering units (EUD, EUE) or CUSTOM unit (EUF) in transmitter configured for SQUARE ROOT output. Or, you have tried to set upper display limit for flow or Custom unit in transmitter with SQUARE ROOT output and URV set to zero (0). In SQUARE ROOT mode, the transmitter's URV cannot equal zero. The Lower and Upper display limits only apply for CUSTOM (EUF) unit in transmitter configured for LINEAR output. The Upper display limit also applies for FLOW (EUD,EUE) and CUSTOM (EUF) units with transmitter in SQUARE ROOT mode , but the Lower display limit is fixed at zero (0) and cannot be changed.

Continued on next page

Operation error codes,
continued

Table A-11 Smart Meter Error Codes and Descriptions, continued.

If error indication is . . .	Then, it means
	You have tried to set a span value that is outside acceptable limits for your transmitter.
	You have tried to invoke a smart meter set function with the transmitter's Write Protect jumper in its Read Only position. You cannot make changes in the smart meter settings when the transmitter's configuration is write protected.

Meter/transmitter interaction

- Cycling transmitter power OFF/ON will have no affect on meter configuration. The meter digital readout will be in the previously set engineering units and applicable upper and lower display limits will be intact when transmitter power is restored. (See **ATTENTION** in Subsection A.4 when setting range values and configuring the meter display.)
- If you switch the transmitter mode from Analog to DE, the ANALOG indicator on the meter will go out. If you switch from DE to Analog mode, the ANALOG indicator will light.
- If you reconfigure the transmitter output conformity from SQUARE ROOT to LINEAR, the meter's digital readout will automatically revert to the default engineering unit of percent and the FLOW indicator will go out when the change is downloaded to the transmitter. Likewise, if you reconfigure the transmitter output conformity from LINEAR to SQUARE ROOT, the meter's digital readout will automatically revert to the default engineering unit of percent and the FLOW indicator will light when the change is downloaded to the transmitter. In either case, you must reconfigure the transmitter as outlined in Subsections A.5 or A.6 of this manual.

Appendix B —Hazardous Locations Reference

Reference Information

Information is provided to clarify the Hazardous Location installation requirements in North America and internationally. An explanaition of the applicalbel enclosure classification systems is also provided.

B.1 North American Classification of Hazardous Locations

Electrical Codes

Installation of electrical apparatus within hazardous (classified) locations of the United States is conducted under the provisions of the National Electrical Code (NEC), ANSI/NFPA 70, Article 500; and within Canada, under the provisions of the Canadian Electrical Code (CEC) C22.1, Part 1, Section 18.

Classifications

In both the United States and Canada, hazardous locations are classified into one of these three classes.

Class	Description of Hazardous Location
I	Presence of flammable gases or vapors may be present in quantities sufficient to produce explosive or ignitable mixtures.
II	Presence of combustible dusts, powders or grains.
III	Presence of easily ignitable fibers or flyings.

Divisions

The classes listed above are further classified into one of the following divisions based upon the level of risk present.

Division	Description of Risk
1	Locations in which hazardous concentrations of flammable gases or vapors, or combustible dust in suspension are continuously, intermittently or periodically present under normal operating conditions.
2	Locations in which flammable gases or vapors are present, but normally confined within closed containers or systems from which they can escape only under abnormal or fault conditions. Combustible dusts are not normally in suspension nor likely to be thrown into suspension.

Continued on next page

B.1 North American Classification of Hazardous Locations, Continued

Examples

Given the above criteria, the following examples are made:

- A **Class III, Division 1** location is a location in which easily ignitable fibers or material processing combustible flyings are handled, manufactured or used.
- A **Class III, Division 2** location is a location in which easily ignitable fibers are stored or handled.

Groups

Flammable gases, vapors and ignitable dusts, fibers and flyings are classified into one of the following groups according to the energy required to ignite the most easily-ignitable mixture within air.

Class I Group	Description of Atmosphere
A	Atmospheres containing acetylene.
B	Atmospheres containing hydrogen, fuel and combustible process gases containing more than 30 percent hydrogen by volume, or gases or vapors of equivalent hazard
C	Atmospheres such as ethyl ether, ethylene, or gasses or vapors of equivalent hazard.
D	Atmospheres such as acetone, ammonia, benzene, butane, cyclopropane, ethanol, gasoline, hexane, methanol, methane, natural gas, naphtha, propane or gases or vapors of equivalent hazard.
Class II Group	**Description**
E	Atmospheres containing combustible metal dusts including aluminum, magnesium, and their commercial alloys, and other metals of similarly hazardous characteristics.
F	Atmospheres containing combustible carbonaceous dusts including carbon black, charcoal, coal or other dusts that have been sensitized by other materials so that they present an explosion hazard.
G	Atmospheres containing combustible dusts not included in Group E or F, including flour wood, grain, and other dusts of similarly hazardous characteristics.

B.1 North American Classification of Hazardous Locations, Continued

Methods of Protection

The following table summarizes available methods of protection for use in given locations.

Protection Concept	Designation	Permitted Use	Principle
Explosionproof	XP	Division 1 & 2	Contains explosion and quenches flame.
Intrinsic Safety	IS	Division 1 & 2	Limit energy of sparks under normal and fault conditions.
Pressurized	Type X and Y	Division 1	Keeps flammable gas out.
Pressurized	Type Z	Division 2	Keeps flammable gas out.
Nonincendive	NI	Division 2	No arcs, sparks or hot surfaces under normal conditions

Temperature Classification

Equipment intended for installation directly within the hazardous location classification must also be classified for the maximum surface temperature that can be generated under normal or fault conditions as referenced to either 40°C (104°F) or the maximum operating ambient of the equipment (whichever is greater). The maximum surface temperature must be less than the minimum autoignition temperature of the hazardous atmosphere present. The temperature shall be indicated in identification numbers as listed in the following table.

Maximum Temperature		Identification Number
Degrees C	Degrees F	
450	842	**T1**
300	572	**T2**
280	536	**T2A**
260	500	**T2B**
230	446	**T2C**
215	419	**T2D**
200	392	**T3**
180	356	**T3A**
165	329	**T3B**
160	320	**T3C**
135	275	**T4**
120	248	**T4A**
100	212	**T5**
85	185	**T6**

Continued on next page

B.1 North American Classification of Hazardous Locations, Continued

Apparatus Parameters

The **Intrinsically Safe Apparatus Parameters** are defined as follows.

Parameter	Description
Vmax	Maximum safe voltage which can be applied to the apparatus terminals.
Imax	Maximum safe current which can be applied to the apparatus terminals.
Ci	Unprotected capacitance in the apparatus which can be considered present at the terminals.
Li	Unprotected inductance in the apparatus which can be considered present at the terminals.

The **Associated Apparatus Parameters** are defined as follows.

Parameter	Description
Voc	Maximum output voltage which can be delivered to the hazardous (classified) location. This voltage is the maximum from a single channel.
Isc	Maximum output current which can be delivered to the hazardous (classified) location. This current is the maximum from a single channel.
*Vt	Maximum output voltage which can be delivered to the hazardous (classified) location. This voltage is the maximum across any combination of terminals of a multiple channel configuration.
*It	Maximum output current which can be delivered to the hazardous (classified) location. This current is the maximum through any combination of terminals of a multiple channel configuration.
Ca	Maximum capacitance which can be connected to the apparatus.
La	Maximum inductance which can be connected to the apparatus.

*CSA does not recognize these parameters at this time.

Continued on next page

B.1 North American Classification of Hazardous Locations, Continued

Entity Concept

Under entity requirements, the concept allows interconnection of intrinsically safe apparatus to associated apparatus, not specifically examined in such combination. The criteria for interconnection is that the voltage (Vmax) and current (Imax), which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal to or greater than the voltage (Voc or Vt) and current (Isc or It) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (Ci) and inductance (Li) of the intrinsically safe apparatus, including interconnecting wiring, must be less than or equal to the capacitance (Ca) and inductance (La) which can be safely connected to the associated apparatus. If these criteria are met, then the combination may be connected and remain intrinsically safe. Both FMRC and CSA d entity parameters are defined in Table B-1 and B-2.

Table B-1 Factory Mutual (FM) Approval

Code	Description
1C	Explosionproof for Class I, Division 1, Groups A, B, C & D. Dust-Ignitionproof for Class II, Division 1, Groups E, F & G. Suitable for Class III, Division 1. Conduit seals required within 18” of enclosure, Group A only. Intrinsically Safe for use in Class I, Division 1, Groups A, B, C & D; Class II, Division 1, Groups E, F & G; Class III, Division 1, T4 at 40°C, T3A at 93°C maximum ambient, when connected in accordance with Honeywell drawing 51204241. Nonincendive for use in Class I, Division 2, Groups A, B, C & D; Suitable for Classes II & III, Division 2, Groups F & G, T4 at 93°C maximum ambient, hazardous locations. 42 Vdc max. Environmental: Indoor and outdoor hazardous locations (NEMA 4X).

Continued on next page

B.1 North American Classification of Hazardous Locations, Continued

Table B-1 Factory Mutual (FM) Approval, Continued

Intrinsic Safety Entity Parameters [1]	Class I, II, III, Divisions 1 and 2, Groups A - G
$V_{Max} \leq$ 42.4 V	
I_{Max} = 225 mA	
P_{Max} = 1.2 W	
C_i = 4.2 nF	
L_i = 0	With no integral indicator, or with integral Smart Meter, option SM.
L_i = 150 μH	With Analog Meter, option ME.

[1] Install in accordance with Honeywell drawing 51204241.

Table B-2 Canadian Standards Association (CSA)

Code	Description
2j	Explosion Proof for Class I, Division 1, Groups B, C & D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F & G; Class III, Division 1. Conduit seals not required. 42 Vdc max. Intrinsically Safe for Class I, Groups A, B, C & D; Class II, Groups E, F & G; Class III, Divisions 1, T4 at 40°C, T3A at 93°C maximum ambient. Install per Honeywell drawing 51204242. Suitable for Class I, II & III, Division 2, Groups A, B, C, D, E, F & G hazardous locations, T4 at 93°C. 42 Vdc max. Environmental: Indoor and outdoor hazardous locations (Encl 4X).

CSA Certified Barriers [1]	Class I, II, III, Division 1 and 2, Groups
28V / 200 Ω	A - G
20V / 150 Ω	C - G

[1] Install in accordance with Honeywell drawing 51204242.

B.2 International Electrotechnical Commission (IEC) Classification of Hazardous Locations

About IEC

The IEC has established a number of recommendations applying to the construction of explosion protected electrical apparatus identified. These recommendations are found within IEC 79-0 through 79-15 and 79-28.

For all EC countries as well as various neighboring countries (CENELEC member states), the European Standards EN 50 014 to EN 50 020 and EN 50 039 apply for the construction of explosion protected electrical apparatus. They were established on the basis of the IEC. However these recommendations are much more detailed by comparsion.

Zones

Hazardous locations, within IEC7-10, are classified into one of these three zones.

ZONE	Description of Hazardous Location
0	Explosive gas atmosphere is present continuously, or is present for long periods.
1	Explosive gas atmosphere is likely to occur in normal operation.
2	Explosive gas atmosphere is not likely to occur in normal operation and, if it does occur, it will exist for a short period only.

IEC Groups

Flammable gases, vapors and mists are further classified into groups according to the energy required to ignite the most easily-ignitable mixture within air. Apparatus is grouped according to the atmospheres it may be used within as follows:

Group	Description of Atmosphere
IIC	Atmospheres containing acetylene, hydrogen, fuel and combustible process gases or vapors of equivalent hazard.
IIB	Atmospheres such as ethyl ether, ethylene, or gasses or vapors of equivalent hazard.
IIA	Atmospheres such as acetone, benzene, butane, cyclopropane, ethanol, gasoline, hexane, methanol, methane, natural gas, naphtha, propane or gases or vapors of equivalent hazard.

Continued on next page

B.2 International Electrotechnical Commission (IEC) Classification of Hazardous Locations, Continued

IEC Methods of Protection

The following table summarizes available methods of protection for use in given locations.

Protection Concept	Designation	Permitted Use	Principle
Flameproof	d	Zone 1 & 2	Contains explosion and quenches flame.
Intrinsic Safety	ia	Zone 0, 1 & 2	Limits energy of sparks under 2 faults.
	ib	Zone 1 & 2	Limits energy of sparks under 1 fault
Pressurized	p	Zone 1	Keeps flammable gases out.
Encapsulation	m	Zone 1 & 2	Keeps flammable gases out.
Increased Safety	e	Zone 1 & 2	No arcs, sparks or hot surface.
Powder Filled	q	Zone 1 & 2	Contains explosion and quenches flame.
Oil Immersion	o	Zone 1 & 2	Keeps flammable gases out.
Non-sparking	nA	Zone 2	No arcs, sparks or hot surfaces under normal conditions.
Enclosed Break	nC	Zone 2	Contains explosion and quenches flame.
Limited Energy	nA	Zone 2	Limits energy of sparks and surface temperature under normal conditions.
Restricted Breathing	nR	Zone 2	Keeps flammable gases out.

Continued on next page

B.2 International Electrotechnical Commission (IEC) Classification of Hazardous Locations, Continued

IEC Temperature Classification

Equipment intended for installation directly within the hazardous location must also be classified for the maximum surface temperature that can be generated under normal or fault conditions as referenced to the maximum operating ambient of the equipment. The maximum surface temperature must be less than the minimum autoignition temperature of the hazardous atmosphere present. The temperature shall be indicated in identification numbers as listed in the following table.

Maximum Temperature		Identification Number
Degrees C	Degrees F	
450	842	**T1**
300	572	**T2**
200	392	**T3**
135	275	**T4**
100	212	**T5**
85	185	**T6**

Certification and Conformity Details

Table B-3 CENELEC / LCIE Certification

Code	Description
3D	Flameproof, Supply ≤ 45 Vdc, IP 66/67EEx d IIC T6.
3A	Intrinsically Safe EEx ia IIC T5, –40 ≤ Ta ≤ 93°C. Flameproof, Supply ≤ 45 Vdc, IP 66/67 EEx d IIC T6.

LCIE Intrinsic Safety Parameters (1)	
U_i = 30 V	
I_i = 100 mA	
P_i = 1.2 W	
C_i = 4.2 nF	
R_i = 0	
L_i = 0	With no integral indicator, or with integral Smart Meter, option SM.
L_i = 150 μH	With Analog Meter, option ME.

(1) Install in accordance with Honeywell drawing 51204243.

B.2 International Electrotechnical Commission (IEC) Classification of Hazardous Locations, Continued

Certification and Conformity Details, continued

Table B-4 Standards Australia (LOSC) Certification

Code	Description
4H	Intrinsically Safe Ex ia IIC T4 Class I Zone 0. Flameproof Ex d IIC T6 Class I Zone 1 Non-Sparking Apparatus - Type of Protection 'n' Ex n IIC T6 Class I Zone 2

LOSC Intrinsic Safety Parameters (1)	
Ui = 42.4 V	
Ii = 225 mA	
Pi = 1.2 W	
Ci = 4.2 nF	
Li = 0	With no integral indicator, or with integral Smart Meter, option SM.
L_i = 150 μH	With Analog Meter, option ME.

(1) Install in accordance with Honeywell drawing 51204309.

Table B-5 Zone 2 (Europe) Declaration of Conformity

Code	Description
3N	Electrical Apparatus With Type of Protection "n" per IEC 79-15. IP 66/67. Ex II 3 GD T(1) X (Council Directive 94/9/EC) $-40 \leq Ta \leq 93°C$.

Zone 2 Parameters
$U_i \leq$ 42 V
$I_i \leq$ 22 mA
Temp. Code (1) T4 at Ta 93°C Maximum Ambient
Temp. Code (1) T5 at Ta 80°C Maximum Ambient
Temp. Code (1) T6 at Ta 65°C Maximum Ambient

B.3 Enclosure Ratings

NEMA and IEC Recognition

The NEMA (National Electrical Manufacturer's Association) enclosure classifications are recognized in the US. The IEC Publication 529 Classifications are recognized throughout Europe and those parts of the world that use the IEC standards as a basis for product certifications. The following paragraphs provide a discussion of the Comparison Between NEMA Enclosure Type Numbers and IEC Enclosure Classification Designations.

IEC Classifications

IEC Publication 529, *Classification of Degrees of Protection Provided by Enclosures*, provides a system for specifying the enclosures of electrical equipment on the basis of the degree of protection provided by the enclosure. IEC 529 does not specify degrees of protection against mechanical damage of equipment, risk of explosion, or conditions such as moisture (produced for example by condensation), corrosive vapors, fungus, or vermin.

IEC Designations

Basically, the IEC designation consists of the letters IP followed by two numerals. The first characteristic numeral indicates the degree of protection provided by the enclosure with respect to persons and solid foreign objects entering the enclosure. The second characteristic numeral indicates the degree of protection provided by the enclosure with respect to the harmful ingress of water.

NEMA Standards

NEMA Standards Publication 250, *Enclosures for Electrical Equipment (1000 Volts Maximum),* does test for environmental conditions such as corrosion, rust, icing, oil, and coolants. For this reason, and because the tests and evaluations for other characteristics are not identical, the IEC enclosure classification designations cannot be exactly equated with NEMA enclosure type numbers.

Continued on next page

IEC Designations, continued

Table B-6 provides an approximate conversion from NEMA enclosure type numbers to IEC enclosure classification designations. The NEMA types meet or exceed the test requirements for the associated IEC classifications; **for this reason the Table cannot be used to convert from IEC classifications to NEMA types.**

Table B-6 NEMA Enclosure Type Numbers and Comparable IEC Enclosure Classification

NEMA Enclosure Type Number	IEC Enclosure Classification Designation
1	IP 10
2	IP 11
3	IP 54
3R	IP 14
3S	IP 54
4 and 4X	IP 56
5	IP 52
6 and 6P	IP 67
12 and 12K	IP 52
13	IP 54

NOTE: This comparison is based on tests specified in IEC Publication 529

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Addendum to
ST 3000 Smart Transmitter
Release 300 and SFC Smart Field Communicator Model STS 103
Installation Guide
34-ST-33-39

Overview

Two new models have been added to the family of ST3000 Smart Transmitters:

Gauge Pressure Model STG19L
Gauge Pressure Model STG99L.

Each of these has an Upper Range Limit (URL) of 10000 psi (690 bar), which is significantly higher than previously available models. Also, each of these new models has significantly higher ratings for Maximum Working Pressure (10000 psi, or 690 bar) and Overpressure (15000 psi, or 1034 bar). The burst pressure is rated at 26000 psi (1793 bar).

Except for the higher operating range, each of these two new models includes physical and functional features similar to those of closely related family members (STG1xL and STG9xL). With the exceptions noted in this addendum, all parts of User Manual 34-ST-33-39C apply to these new models.

Because of the similarities between new and existing models, these new devices can be used as direct replacements in circumstances that require higher pressure capabilities.

Details of pressure ranges for these new models are specified in "Additions and Changes to the Manual", below.

Additions to the User Manual

The additions to User Manual 34-ST-33-39 that relate to the new Gauge Pressure transmitter models are given in Table 1 of this addendum. Use the information in Table 1 to reference and annotate your Installation Guide.

Table 1 – Additions to the User Manual

Page # in User Manual	Sub-Section	Description of Change
18	3.1 Considerations for ST 3000 Transmitter Temperature Limits Table 5 Operating Temperature Limits (Transmitters with Silicone Fluid Fill Fluids)	In the left column of Table 5, under the heading *Gauge Pressure*, add the information as indicated by the highlights in *Exhibit A*, below. (Note: Ranges for Ambient Temperature and Process Interface Temperature are the same as for other models in each series.)
19	3.1 Considerations for ST 3000 Transmitter Pressure Ratings Table 6 Transmitter Overpressure Ratings	In the row of Table 6 titled Gauge Pressure, add the information as highlighted in *Exhibit B*, below.
47	5.1 Wiring Diagrams and Dimension Drawings	In the leftmost column of the table on page 47, add the information as hignhlighted in *Exhibit C*, below.

Exhibit A –Additions to Table 5

Transmitter Type and Model	Ambient Temperature		Process Interface Temperature	
	°C	°F	°C	°F
Draft Range STD110	-40 to 70	-40 to 158	-40 to 70	-40 to 158
Differential Pressure STD125	-40 to 85	-40 to 185	-40 to 85	-40 to 185
STD120, STD130, STD170	-40 to 93	-40 to 200	-40 to 125	-40 to 257
STD904, STD924, STD930, STD974	-40 to 85	-40 to 185	-40 to 125	-40 to 257
Gauge Pressure				
STG140, STG170, STG180, STG14L, STG17L, STG18L, **STG19L**	-40 to 93	-40 to 200	-40 to 125	-40 to 257
	-40 to 93	-40 to 200	-40 to 150 †	-40 to 302 †
STG14T	-15 to 65	5 to 149	-15 to 95 ††	5 to 203 ††
STG93P	-40 to 85	-40 to 185	-40 to 125	-40 to 257
STG944, STG974				
STG90L, STG94L, STG97L, STG98L, **STG99L**	-40 to 85	-40 to 185	-40 to 110	-40 to 230
Absolute Pressure STA122	-40 to 93	-40 to 200	See Specification Sheet	
STA140	-40 to 93	-40 to 200	-40 to 80	-40 to 176

Exhibit B –Additions to Table 6

Transmitter Type	Upper Range Limit (URL)	Maximum Working Pressure Rating	Overpressure Rating
Draft Range	10 inches H_2O (25 mbar)	50 psi (3.5 bar)	50 psi (3.5 bar) (No overpressure protection is provided)
Differential Pressure	400 inches H_2O (1 bar)	3000 psi (210 bar)	3000 psi (210 bar)
	100 psi (7 bar)	3000 psi (210 bar)	3000 psi (210 bar)
	3000 psi (210 bar)	3000 psi (210 bar)	3000 psi (210 bar)
Gauge Pressure	100 psi (7 bar)	100 psi (7 bar)	150 psi (10.3 bar)
	300 psi (21 bar)	300 psi (21 bar)	450 psi (31 bar)
	500 psi (35 bar)	500 psi (35 bar)	750 psi (52 bar)
	3000 psi (210 bar)	3000 psi (210 bar)	4500 psi (310 bar)
	6000 psi (415 bar)	6000 psi (415 bar)	9000 psi (620 bar)
	10000 psi (690 bar)	**10000 psi (690 bar)**	**15000 psi (1034 bar)**
Absolute Pressure	780 mmHg Absolute (1 bar)	780 mmHg Absolute (1 bar)	Full vacuum to 1550 mmHg Absolute (2 bar)
	500 psia (35 bar)	500 psia (35 bar)	750 psia (52 bar)

Dimension Drawings - Series 100 and Series 900, Continued

Transmitter Type and Key Number	Table Selections	Mounting				Drawing Number
		Angle Bracket (MB), (SB)		Flat Bracket (FB)		
		Vertical Pipe	Horizontal Pipe	Vertical Pipe	Horizontal Pipe	
STG944, STG974	See Key Number	51500411		51500409		⇐
	Column		51500410		51500408	⇐
STG140, STG170, STG180,	See Key Number	51500362		51500360		⇐
STA122, STA140	Column		5500361		51500359	⇐
STA922, STA940		51500366		515004364		⇐
			51500365		51500363	⇐
STG14L, STG17L, STG18L, ***STG19L***		51500373		51500371		⇐
			51500372		51500370	⇐
STG90L, STG94L, STG97L,		51500377		51500375		⇐
STG98L, ***STG99L***			51500376		51500374	⇐
STG14T (High Temperature)	½-inch NPT					51404482
	Flush Sanitary Seal					51404484

Honeywell

ST 3000 Smart Transmitter Release 300 and Smart Field Communicator Model STS103

Transmitter Models:

STD110, STD120, STD125, STD130, STD170, STD924, STD930

34-ST-99-25
10/04

Addendum (to Installation Guide 34-ST-33-39)

Overview

Replacement Meterbody and Heads

The ST 3000 Pressure Transmitter, Models:

- **STD110, STD120, STD125, STD130,** and **STD170**
- **STD924** and **STD930** with optional **Tantalum** or **Monel** diaphragm

is now being shipped with newly designed meter body and process heads. If a replacement meter body is needed, it should be ordered from the Model Number stated on the meter body nameplate. This number includes the letter "S" after the model number; for example, STD110**S**-xxx.

This new transmitter is functionally identical to previous models in that the working ranges (Lower Range Limit to Upper Range Limit) and intended applications have not changed. However, the specifications for the maximum Pressure Rating and for the Overpressure Rating have been enhanced in all models except the draft range transmitter. A summary of specifications is given in Table 3.

The new versions, which will continue as Models STD110, STD120, STD125, STD130, STD170, STD924, and STD930, differ only in the physical size and form of the meter body, process head, and associated components.

Installation, operation, maintenance, calibration, and troubleshooting tasks remain virtually the same as for the previous version. Differences appear primarily in torque specifications when replacing meter bodies, and in part numbering and part recognition when replacing components or assemblies.

As an aid in parts recognition, a drawing of the newer style Meter Body, Heads, and Flange Adapters is given in Figure 1 of this addendum. (The flanges on the Process Heads and the Flange Adapters have an angular profile, compared to those on the previous style, which are approximately elliptical in profile.)

For parts details, refer to 34-ST-99-22, Addendum to 34-ST-25-14.

With exceptions noted in this addendum, information given in Installation Guide 34-ST-33-39 applies also to the newer style.

Related Publications

This addendum provides details for installation that span a variety of applications of the Models listed in this addendum. For additional information, refer also to the appropriate publications.

ST 3000 Smart Transmitter
Release 300 and Smart Field Communicator STS103
User's Manual
34-ST-25-14 (with addendum 34-ST-99-21)

Additions to the Installation Guide

The additions to Installation Guide 34-ST-33-39 that relate to the newly designed meter body and process heads are given in Table 1 of this addendum. Use the information in Table 1 to reference and annotate your User Manual.

Table 1 – Additions to the User Manual

Page # in User Manual	Sub-Section	Description of Change
19	3.3 Considerations for ST 3000 Transmitter Table 6 Transmitter Overpressure Ratings	The Maximum Working Pressure Rating and the Overpressure Rating has been enhanced for all models included in this addendum except for the draft range transmitter. For more information, refer to Table 3 in this Addendum.
38	4.2 Piping ST3000 Transmitter **Table 15 Installing Flange Adapter**	In Step 2 and in Step 4, the reference to the "Teflon (white) gasket should be "**gasket or O-ring**". In Step 5, do not use the torque specification of 47.5 to 54 N · m (35 to 40 ft-lb). Instead, use the following: **47,5 N•m +/- 2,4 N•m (35 Lb-Ft +/- 1.8 Lb-Ft)**.
46	5.1 Wiring Diagrams and Dimension Drawings Dimension drawings-Series 100 and Series 900	The numbers of dimension drawings for the newly designed models are given in Table 2 in this addendum.

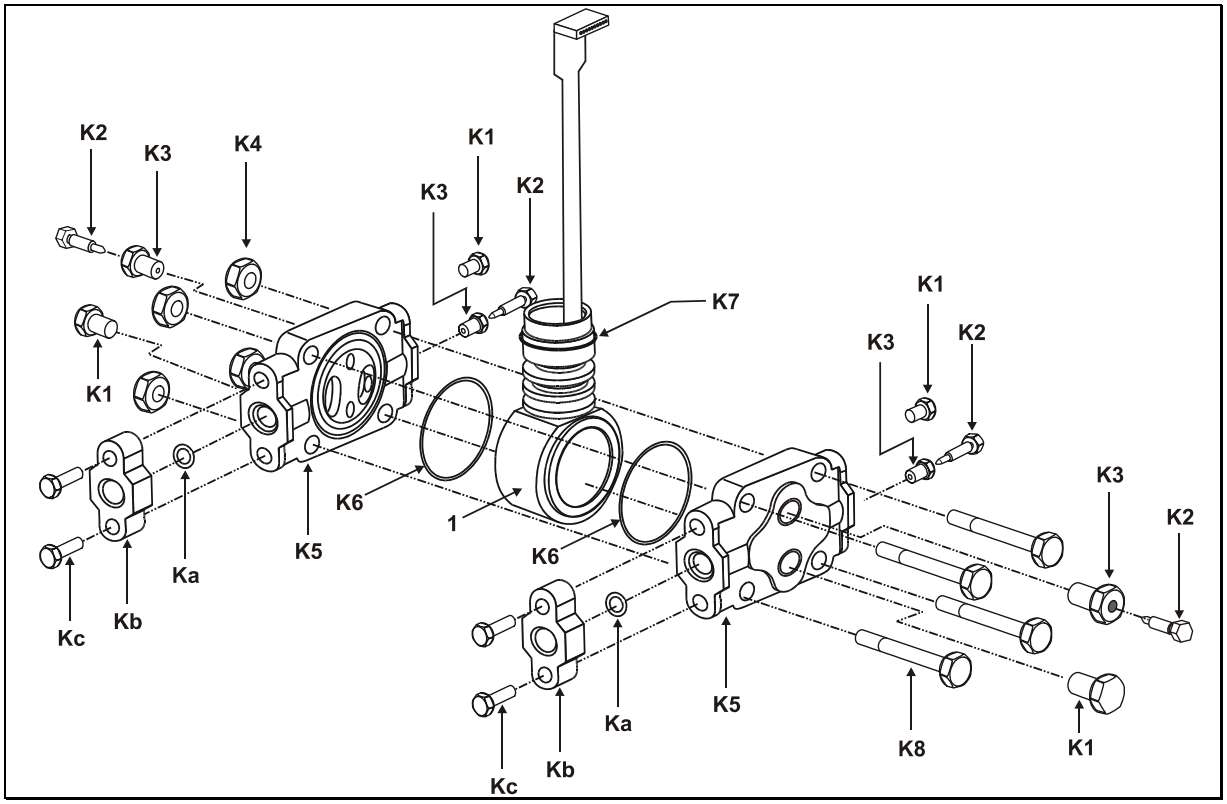


Figure 1 ST 3000 Model STD110, STD120, STD125, STD130, STD170, STD924, STD930 (Rev S or greater)

Dimension Drawings

The following table provides references to dimension drawings for newly designed ST 3000 Pressure Transmitters (Revision S and greater). If you need a copy of a drawing, please determine the appropriate drawing number from the following table and contact your Honeywell representative.

Table 2 Dimension Drawings for Transmitter Models STD110, STD120, STD125, STD130, STD170, STD924, STD930 (Revision S or Greater)

Equipped with	Angle Bracket		Flat Bracket	
A-G manifold part #	Vertical Pipe	Horizontal Pipe	Vertical Pipe	Horizontal Pipe
(none)	51452896	51452895	51452894	51452893
M4AV1	51452886	51452888	51452890	51452892
M4TV1	51452885	51452887	51452889	51452891

Table 3 Pressure Specification and Ratings Summary Comparisons (Revision S or Greater)

Transmitter Model	Upper Range Limit	Maximum Allowable Working Pressure *(Note 1)*		Overpressure Rating *(Note 1)*	
		Previous	New Design	Previous	New Design
STD110	10 inches H2O (25 mbar)	50 psi (3.5 bar)	(Same as previous)	50 psi (3.5 bar)	(Same as previous)
STD120, STD924	400 inches H2O (1 bar)	3000 psi (207 bar)	**4500 psi (310 bar)**	3000 psi (207 bar)	**4500 psi (310 bar)**
STD125	600 inches H2O (1.5 bar)	"	"	"	"
STD130, STD930	100 psi (7 bar)	"	"	"	"
STD170	3000 psi (207 bar)	"	"	'"	"

Note 1 **Maximum Allowable Working Pressure and Overpressure Rating vary with materials of construction; for more specific information refer to the appropriate Specification and Model Selection Guide. Transmitters with Graphite Gaskets have a 3625 psi rating (250 bar) except for the Draft Range Transmitter which maintains a 50 psi rating. Flange Adapters with Graphite Gaskets have a 3000 psi rating.**

ST 3000 Smart Pressure Transmitter, Release 300 and Smart Communicator Model STS 103

34-ST-99-36
10/04

Addendum
(to Installation Guide 34-ST-33-39)

Overview

ATEX Directive 94/6/EC

The ATEX Directive 94/6/EC is a European CE Mark directive concerning products that are designed for use in potentially explosive environments. This "New Approach" directive is based on, and is an expansion of, European Norms (EN, CENELEC standards).

On June 30, 2003, the ATEX (ATmospheres EXplosibles) directive will replace directives currently in effect, and from that time, only products with the ATEX certification and with ATEX labeling will be approved for free movement in the EU (European Union) and EFTA (European Free Trade Association) countries. As defined in the directive, "free movement" refers to:

- placing a product on the market, and/or
- placing a product into service.

The ATEX Directive 94/6/EC is a living (set of) document(s), subject to further change and refinement, whose details are beyond the scope of this addendum. Further information can be obtained in the Official Journal of the European Communities No L100/1, and in related publications such as Guidelines on the Application of Directive 94/9/EC. Both of these items are available at:

http://europa.eu.int/comm/enterprise/atex/index.htm

Products that have been previously certified under the EN and CENELEC European Norms, and which comply fully with all standards in the New Approach directive have, by application, received certification under ATEX Directive 94/6/EC.

The Honeywell ST3000 Smart Pressure Transmitter is now ATEX certified, and all units manufactured currently and in the future will include labeling that includes all markings required under the ATEX directive.

Inclusions

To ensure that all required information will be available to the user, the following items are include with this Addendum for reference:

1. Declaration of Conformity – ATEX CE0344 (Honeywell document number 51452504 Revision B).
2. Certificate of Manufacturer – Ex II 3 G, EEx nA IIC ATEX CE (Honeywell document number 51452622 Revision C).

Purpose and Content of this Addendum

This Addendum includes information required under the ATEX Directive regarding:

1. The appearance and meaning of each certification mark (CE Mark) that appears on the label(s) affixed to the product.

2. Instructions for installation and use of the product.

   Information required for use of this product is given in:

   34-ST-25-14B - ST 3000 Smart Transmitter Release 300 and Smart Field Communicator Model STS103, and

   Installation information is given in

   34-ST-33-39 - ST 3000 Smart Transmitter Release 300 and Smart Field Communicator Model STS103 Installation Guide,

   of which this Addendum is a part.

Details regarding certification marks that appear in labeling for this product are given in this addendum.

Attention

The publications cited above and the functioning and construction (except for labeling) of the devices described therein are essentially unchanged. The purpose of this addendum is to provide details the purpose and appearance of the labels attached to each device under ATEX Directive 94/6/EC.

Attention

Before installing the equipment in a potentially explosive atmosphere, please read the information provided in this Addendum, which supports the ATEX certifications for this product.

CE Conformity

The ST 3000 Smart Pressure Transmitter is in conformity with the protection requirements of the following European Council Directives: 94/9/EC, the Explosive Atmospheres (ATEX) Directive, 89/336/EEC, the Electromagnetic Compatibility (EMC) Directive, and the Pressure Equipment (PED) directive.

In conformity with the ATEX directive, the CE mark on the certification nameplate includes the Notified Body identification number 0344 (KEMA 01ATEXQ3199) adjacent to the EC Type Examination Certificate number.

In conformity with the Pressure Equipment Directive, models rated greater than 200 bar (2,900 psi) have an additional CE mark applied to the meter body data plate in accordance with 97/23/EC, Article 15. Models rated at less than 200 bar have no CE mark on the meter body data plate per 97/23/EC, Article 3, Section 3.

Deviation from the installation conditions in this manual may invalidate this product's conformity with the Explosive Atmospheres, Pressure Equipment, and EMC Directives.

Conformity of this product with any other "CE Mark" Directive(s) shall not be assumed.

Marking, ATEX Directive

Honeywell's Model ST 3000 Smart Pressure Transmitter, with the following nameplates attached, has been certified to comply with Directive 94/9/EC of the European Parliament and the Council as published in the Official Journal of the European Communities No. L 100/1 on 19-April-1994.

The following information is provided as part of the labeling of the transmitter:

- Name and Address of the manufacturer: Honeywell, Phoenix, AZ 85053 USA.
- Notified Body identification: KEMA Quality B.V., Arnhem, the Netherlands

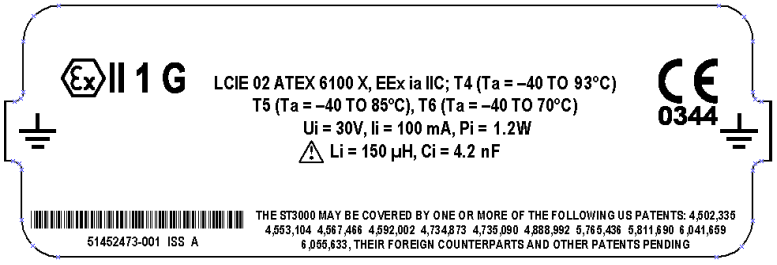
CE 0344

- For complete model number, see the Model Selection Guide for the particular model of pressure transmitter.
- The serial number of the transmitter is located on the Meter Body data-plate. The first two digits of the serial number identify the year (02) and the second two digits identify the week of the year (23); for example, 0223xxxxxxxx indicates that the product was manufactured in 2002, in the 23 rd week.

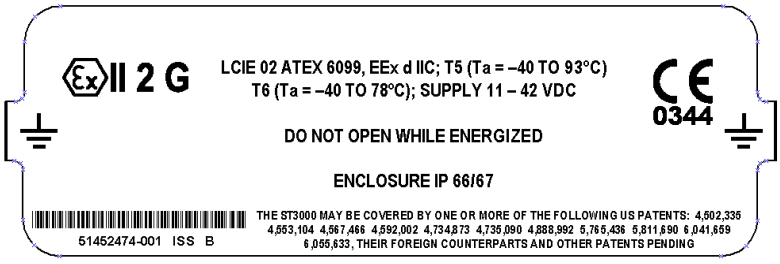
Apparatus Marked with Multiple Types of Protection

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

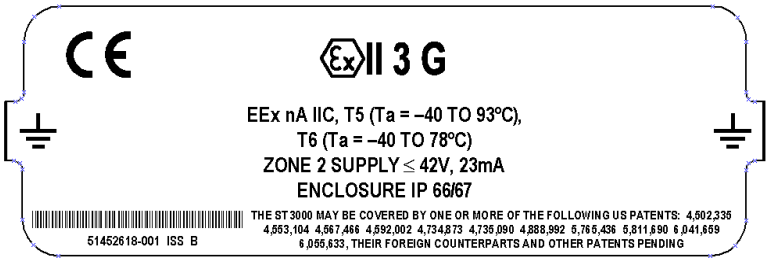
Nameplate 51452473-001, ia, 4-20 mA / DE, is mounted on the enclosure. The following is a representation of this nameplate:



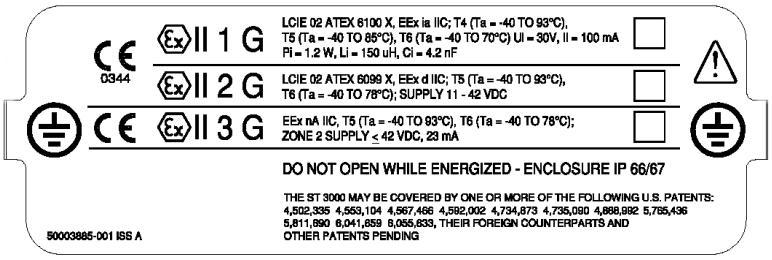
Nameplate 51452474-001, d, 4-20 mA / DE, is mounted on the enclosure. The following is a representation of this nameplate:



Nameplate 51452618-001, nA, 4-20 mA / DE, is mounted on the enclosure. The following is a representation of this nameplate:



Nameplate 50003885-001, 4-20 mA / DE, multiple certification nameplate. The following is a representation of this nameplate:



Specific Parameters for Intrinsic Safety

Field wiring terminals, (**+** , **–**):	Ui = 30 V,	Ii = 100 mA,	Pi = 1.2 W
Without local analog meter, ME:	Ci = 4.2 nF,	Ri = 0,	Li = 0
With local analog meter, ME:	Ci = 4.2 nF,	Ri = 0,	Li = 150 µH
With local smart digital meter, SM:	Ci = 4.2 nF,	Ri = 0,	Li = 0

Special conditions for safe use,

Intrinsic Safety (X)

The pressure transmitter is an intrinsically safe apparatus that can be installed in potentially explosive atmospheres.

The power terminals (+, -) must be connected only to a certified associated intrinsically safe apparatus.

The electrical parameters (U, I, and P) of the associated apparatus connected to the power terminals (+, -) must not exceed the following values:

Ui ≤ 30V
Ii ≤ 100 mA
Pi ≤ 1,2 W

Ambient temperature: - 50ºC to 93ºC

NOTE: -50ºC to 93ºC is the certification and "Operative Limits" for the product family. Refer to individual Specification Sheets for the standard "Rated Condition" ambient limits for a particular model that, as shown on the data-plate and certification nameplate, may be less than the certification limits.

Temperature classifications:

IS (ia) 4 – 20 mA / DE	Flameproof (d)
T4 up to Ta ≤ 93ºC	T5 up to Ta ≤ 93ºC
T5 up to Ta ≤ 85ºC	T6 up to Ta ≤ 78ºC
T6 up to Ta ≤ 70ºC	

Enclosure classification: IP 66/67, Type 4X

Specific Parameters for Flameproof Installation

Power supply to field wiring terminals, (**+**, **–**): Ucc ≤ 42 V

Output Signal: 4–20 mA

Special conditions for safe use, Flameproof Installation

Ambient operating temperature: - 50 to 93ºC

NOTE: -50ºC to 93ºC is the certification and "Operative Limits" for the product family. Refer to individual Specification Sheets for the standard "Rated Condition" ambient limits for a particular model that, as shown on the data-plate and certification nameplate, may be less than the certification limits.

Specific Parameters for Non-Sparking Zone 2 Installation

(Honeywell certified)

Supply Voltage:	11-42 Vdc
Supply Current:	23 mA
Ambient Temperate Limits:	- 50°C to 93°C
Temperature Classification:	T6 at Ta ≤ 78°C
	T5 at Ta ≤ 93°C

Special Conditions for Safe Use, Non-Sparking Zone 2 Installation

(Honeywell certified)

- The installation of this equipment in Zone 2 hazardous areas must comply with VDE specification 0165, IEC 60079-14, EN 50021 and/or valid national standards for installation and operation.
- Before commissioning of this equipment, it must be verified that the power supply voltage cannot exceed the 42 Vdc maximum for 4-20 mA analog and DE equipment.
- The electronic assemblies in these units are non-repairable items and if faulty must be replaced. The electrical power supply must be switched off before any replacement and during any time that the wiring terminations are being connected or disconnected.

51452504, Revision B

DECLARATION OF CONFORMITY

ATEX CE 0344

We declare under our sole responsibility that the following products,

ST 3000 Smart Pressure Transmitters, Series 100 and 900, Release 300 (per attached list)

to which this declaration relates, are in conformity with the protection requirements of Council Directive: 94/9/EC (ATEX Directive) on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres, and 89/336/EEC (EMC Directive) as amended by 92/31/EEC and 93/68/EEC on the approximation of the laws of the Member States relating to Electromagnetic Compatibility.

The models covered by this Declaration and evidence of conformity with the ATEX Directive are shown on the attached list. Conformity to the ATEX Directive is in accordance with the following European standards.

EN 50014-1997 Electrical Apparatus for Potentially Explosive Atmospheres - General Requirements
EN 50018-2000 Electrical Apparatus for Potentially Explosive Atmospheres - Flameproof Enclosure “d”
EN 50020-1994 Electrical Apparatus for Potentially Explosive Atmospheres - Intrinsic Safety "i"
EN 50284-1999 Special Requirements for Construction, Test and Marking of Electrical Apparatus of Equipment Group II, Category 1 G

Notified Bodies:	**EC Type Examination Certificates** LCIE – Groupe Bureau Veritas – 0081 33, Avenue du Général Leclerc 92260 Fontenay-aux-Roses France	**Production Quality Assurance Notification** KEMA Quality B. V. – 0344 Utrechtseweg 310 6812 AR Arnhem The Netherlands
Manufacturing Locations:	**Honeywell Industrial Solutions** Industrial Solutions 2500 West Union Hills Drive Phoenix, Arizona 85027 USA	

The authorized signatory to this declaration, on behalf of the manufacturer, and the Responsible Person is identified below.

Honeywell International Inc.

Industrial Measurement & Control
1100 Virginia Drive
Fort Washington, PA 19034 USA

Frederick M. Kent
Standards & Approvals Engineer,
(ATEX Authorized Person)

Issue Date: 18 August, 2002

ST3000, R300 Pressure Transmitters

Certificate	Protection	Model	Description	Factory
LCIE 02 ATEX 6099	**Ex** II 2 G, EEx d IIC, T6 or T5	ST……-3D	4-20 mA / DE / HART / Fieldbus	Phoenix
LCIE 02 ATEX 6100X	**Ex** II 2 G, EEx ia IIC, T6 to T4	ST……-3S	4-20 mA / DE	Phoenix
LCIE 02 ATEX 6101X	**Ex** II 1 G, EEx ia IIC, T6 to T4	ST…-HC…-3S	4-20 mA / HART	Phoenix
LCIE 03 ATEX 6175X	**Ex** II 1 G, EEx ia IIC, T6 to T4	ST…-HC…-3S	Foundation TM Fieldbus	Phoenix

Model	Series	Description
STA122	100	Absolute Pressure Transmitter
STA140	100	Absolute Pressure Transmitter
STD110	100	Differential Pressure Transmitter
STD120	100	Differential Pressure Transmitter
STD125	100	Differential Pressure Transmitter
STD130	100	Differential Pressure Transmitter
STD170	100	Differential Pressure Transmitter
STF128	100	Flange Mounted Liquid Level Transmitter
STF12F	100	Flange Mounted Liquid Level Transmitter
STF132	100	Flange Mounted Liquid Level Transmitter
STF13F	100	Flange Mounted Liquid Level Transmitter
STF14F	100	Flange Mounted Liquid Level Transmitter
STF14T	100	High Temperature Flange Mounted Pressure Transmitter
STG140	100	Gauge Pressure Transmitter
STG14L	100	Gauge Pressure Transmitter
STG14T	100	High Temperature Gauge Pressure Transmitter
STG170	100	Gauge Pressure Transmitter
STG17L	100	Gauge Pressure Transmitter
STG180	100	Gauge Pressure Transmitter
STG18L	100	Gauge Pressure Transmitter
STR12D	100	Remote Diaphragm Seal Pressure Transmitter
STR13D	100	Remote Diaphragm Seal Pressure Transmitter
STR14A	100	Remote Diaphragm Seal Pressure Transmitter
STR14G	100	Remote Diaphragm Seal Pressure Transmitter
STR17G	100	Remote Diaphragm Seal Pressure Transmitter
STA922	900	Gauge and Absolute Pressure Transmitter
STA940	900	Gauge and Absolute Pressure Transmitter
STD924	900	Differential Pressure Transmitter
STD930	900	Differential Pressure Transmitter
STD974	900	Differential Pressure Transmitter
STF904	900	Flange Mounted Liquid Level Transmitter
STF924	900	Flange Mounted Liquid Level Transmitter
STF92F	900	Flange Mounted Liquid Level Transmitter
STF932	900	Flange Mounted Liquid Level Transmitter
STF93F	900	Flange Mounted Liquid Level Transmitter
STG19L	900	High Pressure Gauge Transmitter
STG93P	900	Flush Mount Gauge Pressure Transmitter
STG944	900	Gauge and Absolute Pressure Transmitter
STG94L	900	In-Line Gauge Pressure Transmitter
STG974	900	Gauge and Absolute Pressure Transmitter
STG97L	900	In-Line Gauge Pressure Transmitter
STG98L	900	In-Line Gauge Pressure Transmitter
STG99L	900	High Pressure Gauge Transmitter
STR93D	900	Remote Diaphragm Seal Pressure Transmitter
STR94G	900	Remote Diaphragm Seal Pressure Transmitter

Certificate of Manufacturer

II 3 G EEx nA IIC ATEX CE

This certificate applies to the following equipment:

ST 3000 Smart Pressure Transmitters, Series 100 and 900, Release 100 and 900, 4-20 mA, DE, HART, and FOUNDATION™ Fieldbus (per attached list)

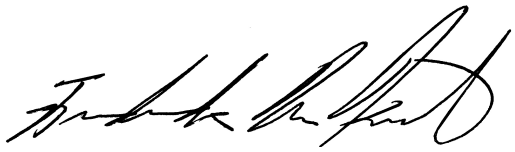
This equipment has no arcing or sparking parts and no ignition-capable hot surfaces, and therefore conforms to Clause 6.3.1.3 of VDE 0165/2.91, IEC 60079-14, and EN 50021 for operation in Zone 2 hazardous areas providing that the following conditions are observed. The equipment contains no intrinsically safe or energy-limiting components. The listed equipment are 2-wire devices that receive their power and signal carrier from the same 4-20 mA signal current or Fieldbus supply. In normal operation, the maximum current supply is 23 mA for ≤ 4-20 mA analog, DE or HART, and ≤ 260 mA for Fieldbus.

Conditions for the application of the above equipment in Zone 2 hazardous areas:

1. The installation of this equipment in Zone 2 hazardous areas must comply with VDE specification 0165, IEC 60079-14, EN 50021 and/or valid national standards for installation and operation.
2. Before commissioning this equipment, it must be verified that the power supply voltage cannot exceed the 42 Vdc maximum for 4-20 mA analog, DE and HART equipment, and 24 Vdc for Fieldbus equipment.
3. The electronic assemblies in these units are non-repairable items and if faulty, must be replaced. The electrical power supply must be switched off before any replacement and during any time that the wiring terminations are being connected or disconnected.
4. The technical data supplied by the manufacturer must be adhered to.

Specifications for Use in Zone 2		
	4-20 mA / DE / HART	**Fieldbus**
Supply Voltage:	11 – 42 Vdc	10 – 24 Vdc
Supply Current:	23 mA	260 mA
Ambient temperature limits:	–50 to 93ºC	
Temperature Classification:	T6 at Ta ≤ 78ºC T5 at Ta ≤ 93ºC	

Manufacturing Location: **Honeywell Process Solutions**
2500 West Union Hills Drive
Phoenix, Arizona 85053 USA



Honeywell International Inc.
Industrial Measurement & Control
1100 Virginia Drive
Fort Washington, PA 19034 USA

Frederick M. Kent
Standards & Approvals Engineer,
(ATEX Authorized Person)

Issue Date: 25 June 2004

ST3000, R300 Pressure Transmitters

Model	Series	Description
STA122	100	Absolute Pressure Transmitter
STA140	100	Absolute Pressure Transmitter
STD110	100	Differential Pressure Transmitter
STD120	100	Differential Pressure Transmitter
STD125	100	Differential Pressure Transmitter
STD130	100	Differential Pressure Transmitter
STD170	100	Differential Pressure Transmitter
STF128	100	Flange Mounted Liquid Level Transmitter
STF12F	100	Flange Mounted Liquid Level Transmitter
STF132	100	Flange Mounted Liquid Level Transmitter
STF13F	100	Flange Mounted Liquid Level Transmitter
STF14F	100	Flange Mounted Liquid Level Transmitter
STF14T	100	High Temperature Pressure Transmitter
STG140	100	Gage Pressure Transmitter
STG14L	100	Gage Pressure Transmitter
STG14T	100	High Temperature Pressure Transmitter
STG170	100	Gage Pressure Transmitter
STG17L	100	Gage Pressure Transmitter
STG180	100	Gage Pressure Transmitter
STG18L	100	Gage Pressure Transmitter
STR12D	100	Remote Diaphragm Seal Pressure Transmitter
STR13D	100	Remote Diaphragm Seal Pressure Transmitter
STR14A	100	Remote Diaphragm Seal Pressure Transmitter
STR14G	100	Remote Diaphragm Seal Pressure Transmitter
STR17G	100	Remote Diaphragm Seal Pressure Transmitter
STA922	900	Gage and Absolute Pressure Transmitter
STA940	900	Gage and Absolute Pressure Transmitter
STD924	900	Differential Pressure Transmitter
STD930	900	Differential Pressure Transmitter
STD974	900	Differential Pressure Transmitter
STF904	900	Flange Mounted Liquid Level Transmitter
STF924	900	Flange Mounted Liquid Level Transmitter
STF92F	900	Flange Mounted Liquid Level Transmitter
STF932	900	Flange Mounted Liquid Level Transmitter
STF93F	900	Flange Mounted Liquid Level Transmitter
STG19L	900	High Pressure Gauge Transmitter
STG93P	900	Flush Mount Gage Pressure Transmitter
STG944	900	Gauge and Absolute Pressure Transmitter
STG94L	900	In-Line Gage Pressure Transmitter
STG974	900	Gauge and Absolute Pressure Transmitter
STG97L	900	In-Line Gauge Pressure Transmitter
STG98L	900	In-Line Gauge Pressure Transmitter
STG99L	900	High Pressure Gauge Pressure Transmitter
STR93D	900	Remote Diaphragm Seal Pressure Transmitter
STR94G	900	Remote Diaphragm Seal Pressure Transmitter

Honeywell

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