

Reset Corrects (DE only)	<Return>		
	Reset Corrects	Executing this selection Resets the Zero, LRV, and URV Corrects back to Factory values	Press ↓ to enter menu selection Scroll to Reset Corrects Press ↓ to initiate
DAC Trim Note: Loop must be removed from Automatic Control (HART/DE only)	<Return>		
	Trim Zero	This selection will calibrate the loop zero output to 4.000 mA Connect a current meter to the transmitter to monitor the loop output. When you press Enter, the transmitter will set the loop output to 4 mA. When the prompt "Enter reading" appears, enter the value shown on the current meter (in milliamps) and press Enter again. The transmitter will adjust the DAC output to 4mA.	Press ↓ to enter menu selection Scroll to Trim Zero or Trim Span
	Trim Span	This selection will calibrate the loop span output to 20.000 mA Connect a current meter to the transmitter to monitor the loop output. When you press Enter, the transmitter will set the loop output to 20 mA. When the prompt "Enter reading" appears, enter the value shown on the current meter (in milliamps) and press Enter again. The transmitter will adjust the DAC output to 20 mA.	Press ↓ to initiate ↑ and ↓ to select number. ↓ to enter and shift to next digit
	Set DAC Normal	This selection allows the loop to be returned to its Normal mode (Automatic Control) after performing the Trim operation.	Press ↓ to enter menu selection Scroll to Set DAC Normal Press ↓ to initiate
Loop Test Note: Loop must be removed from Automatic Control (HART/DE only)	<Return>		
	Set DAC Output	This selection allows the user to force the DAC output to any value between 3.8 and 20.8 mA. Note: This selection will put the DAC into Fixed Output Mode.	Press ↓ to enter menu selection Scroll to Set DAC Output Press ↓ to initiate ↑ and ↓ to select number. ↓ to enter and shift to next digit
	Set DAC Normal	This selection allows the loop to be returned to its Normal mode (Automatic Control) after performing the Set DAC Output operation	Press ↓ to enter menu selection Scroll to Set DAC Normal Press ↓ to initiate

Table 10 – Transmitter Setup Menus

<Return> Return to the Level 1 menu			
Device Setup	<Return>		
	Tag ID (HART/DE only)	□□□□□□□□	Enter Tag ID name up to 8 characters long. □ = any Alphanumeric value
	Damping (sec) (HART/DE only)	##. #	Selection applies digital filtering to suppress noise effects on the PV. The limits for this value are 0.0 to 32.0 seconds
	NAMUR Output (HART/DE only)	Disabled	Disabling sets the loop output and burnout levels to the Honeywell levels
		Enabled	Enabling sets the loop output and burnout levels to the NAMUR levels
	Loop Ctrl Mode (Dual Inputs only) (HART/DE only) (Read only for DE)	Average, Differential, Sensor 1, Sensor 2, Split-Range, Redundant	Mode of Loop control
	Loop Ctrl Src (HART only)	Sensor 1, Sensor 2	Input sensor currently controlling the Loop
	Delta Limit (Dual Inputs only) (HART/FF only)	####.##	User can configure the Delta Limit. If the Critical Excess Delta Detection has also been enabled, the critical fault will be set when the PV Delta (Sensor 1-Sensor 2 value) exceeds the Delta Limit."
	Bumpless Damping (HART/FF only)	##. #	Damping value for the transition of Loop Control between Sensors when Loop Ctrl Mode is Split-Range or Redundant
	Hysteresis (Dual Inputs only) (HART/FF only)	###.##	Hysteresis value relative to the MRV for the transition of Loop Control between Sensors when Loop Ctrl Mode is Split-Range
Break Detect*	Enable, Disable	When enabled, adds a constant bias value to the Sensor 2 measured value to equate it to the Sensor 1 measured value at the moment selected.	

Press ↵ to enter menu selection
↑ and ↓ to select Alphanumeric
↵ to enter and shift to next character to the right.

* Spurious readings may occur if Break Detect is off in delta mode

Break Detect (FF read only)	Enabled, Disabled	Enable or disable detection of Input wire break	
Latching (FF read only)	Enabled, Disabled	When enabled, causes all critical sensor input failures to latch to the Critical Fault state. The fault may only be cleared by device reset. When disabled, the critical sensor input failure will be cleared if the input recovers.	Press ↵ to enter menu selection
CJ Type (FF read only)	Internal, External, Fixed	Determines the source of the Cold Junction compensation for thermocouple Sensor types.	↑ and ↓ to select entry. ↵ to enter
Fixed CJ Value (FF read only)	####.##	When CJ Type is Fixed, specifies the Cold Junction temperature value for thermocouple Sensor types. Degrees Celsius. Fixed CJ temperatures below -50 degrees have no effect on measured values.	
Loop Ctrl Mode (HART/DE) (DE read only) (Dual input only)	Average, Difference, Sensor 1, Sensor 2, Split-Range, Redundant	Mode of Loop control	
Loop Source (HART/DE) (Dual input only)	Sensor 1, Sensor 2	Input sensor currently controlling the Loop	Read Only Parameter
LRV (HART/DE) URV (HART/DE)	#. ## #. ##	The limits are: the Lower Range Limit (LRL) and the Upper Range Limit (URL) of the selected Sensor 1 ID	
Set LRV (HART/DE)	Set Lower Range Value	ATTENTION: Executing this service will set the Lower Range Value (LRV) equal to the input pressure	
Set URV (HART/DE)	Set Upper Range Value	ATTENTION: Executing this service will set the Upper Range Value (URV) equal to the input pressure	
MRV (HART/FF) (FF read only)	Set Middle Range Value	Limits are the minimum URL and maximum LRL of the selected Sensor 1 and Sensor 2 IDs. Determines the point of transition of Loop Control between Sensor 1 and Sensor 2 for Split-Range Loop Control Mode.	Press ↵ to enter menu selection ↑ and ↓ to select digit. ↵ to enter
Hysteresis (HART/FF) (FF read only)	###.##	Hysteresis value relative to the MRV for the transition of Loop Control between Sensors when Loop Ctrl Mode is Split-Range	
Bumpless Damping (HART/FF) (FF read only)	##.#	Damping value for the transition of Loop Control between Sensors when Loop Ctrl Mode is Split-Range or Redundant	
Damping (HART/DE)	#. ##	Selection applies digital filtering to suppress noise effects on the PV. The limits for this value are 0.0 to 32.0 seconds	

NAMUR Output (HART/DE)	Enabled Disabled	Disabling sets the loop output and burnout levels to the Honeywell levels	Press ↵ to enter menu selection ↑ and ↓ to select entry. ↵ to enter
DAC Zero Trim (HART/DE) Note: Loop must be removed from Automatic Control	DAC Zero Trim	This selection allows the loop zero output 4mA value to be trimmed. Note: You must connect a current meter to the transmitter to monitor the loop output.	
DAC Span Trim (HART/DE) Note: Loop must be removed from Automatic Control	DAC Span Trim	This selection allows the loop span output 20mA value to be trimmed. Note: You must connect a current meter to the transmitter to monitor the loop output.	
Loop Test (HART/DE) Note: Loop must be removed from Automatic Control	Loop Test 12.000	This selection allows the user to force the DAC output to any value between 3.8 and 20.8 mA. Note: This selection will put the DAC into Fixed Output Mode, as indicated by the flashing output value. Navigation away from this menu item will return the loop to Normal (Automatic) Mode.	
Alarm Type 1	None PV High PV Low Critical Diagnostic Redundant Input Active Rate of Change* Deviation* (*Available only with Advanced Diagnostics Option).	Type of alarm.	Read Only Parameter
Alarm Type 2			
Tag ID (HART/DE)	□□□□□□□□	Enter Tag ID name up to 8 characters long. □ = any Alphanumeric value	Press ↵ to enter menu selection ↑ and ↓ to select entry. ↵ to enter
HART Device ID (HART only)	Unique for each device	Unique ID for device	Read Only Parameter
HART PV Units (HART only)	Units of transmitted PV	Units for the Primary Variable (Writable - for TC/RTD inputs Read only - mV and Ohm)	Press ↵ to enter menu selection
HART SV Units (HART only)	Units of transmitted SV	Units for the Secondary Variable	

Install Date (HART only)	DD MM YYYY	This selection allows the user to enter the date a transmitter is installed. The Install Date is entered in sequence of Day, Month, and Year, followed by the new date and the prompt Write Date to confirm the entry. CAUTION: The Install Date can only be written once in the life of the Transmitter. You cannot erase or overwrite the Install Date once it has been written.	↑ and ↓ to select entry. ↵ to enter
Firmware	Display Electronics Sensor	Menu item shows the current Firmware versions of the Display, Electronics Module and the Sensor Module	Read Only Parameter
Protocol	HART, DE, FF	Menu item shows the communications protocol	Read Only Parameter
Model Key (HART/FF)		Identifies the type and range of the transmitter	Read Only Parameter
<Exit Menu>			

4.1.7 Selecting a new setting from a list of choices

Use the procedure described below to select a new setting for parameters that present a list of choices (e.g., PV Display, Temperature Units, etc.)

1. Press ↵ to begin the edit process. The Basic Display will show the current setting of the item on the lower line, left justified.
2. Press the ↑ or ↓ buttons to scroll through the list of choices.
3. Press ↵ to make your selection. The new selection will be stored in the transmitter and displayed on the lower line, right justified.

4.3. Three Button Operation with no Display Installed

When there is no Display installed, the buttons can be used to perform a Zero or Span adjustment of the transmitter. Caution should be taken to insure these adjustments are only made when the correct input values are applied. This feature is not available in the Fieldbus transmitter variant.

4.3.1 Zero Adjustment

This adjustment is the same as performing a Set LRV using the Display.

1. Connect a current meter or voltmeter as shown in [Figure 20](#) to monitor the PV output of the transmitter.
2. Using an accurate input source, apply a signal equivalent to the transmitter LRV.
3. Press the Down (↓) and Zero (↑) buttons together to set the Zero.
4. Verify that the output is now 4 mA.

4.3.2 Span Adjustment

This adjustment is the same as performing a Set URV using the Display.

1. Connect a current meter or voltmeter as shown in [Figure 20](#) to monitor the PV output of the Transmitter.
2. Using an accurate input source, apply a signal equivalent to the desired Upper Range Value of the transmitter.
3. Press the **Down** (↓) and **Span** (←) buttons together to set the span.
4. Verify that the PV output is now 20 mA.



You can also use the MCT 202 Toolkit to make any adjustments to an STT850 SmartLine Temperature Transmitter. Alternately, certain adjustments are possible through an Experion Station or Universal Station, if the STT850 is digitally integrated with either of these stations.

4.4. Changing the Default Failsafe Direction

For HART or DE the transmitters are shipped with a default failsafe direction of upscale. This means that the transmitter output will set the current output to upscale failsafe (maximum output) upon detection of a critical status. You can change the direction from upscale failsafe to downscale failsafe (minimum output) by moving the top jumper located in the Electronics module.

4.4.1 DE and Analog Differences

Failsafe operation is somewhat different between DE and analog operation:

- **Analog operation** – Upscale failsafe drives the transmitter output to 21.8 mA. Downscale failsafe drives the transmitter output to 3.6 mA.
- **DE operation** – Upscale failsafe causes the transmitter to generate a + **infinity** digital signal. Downscale failsafe causes the transmitter to generate a – **infinity** digital signal.

The transmitter electronics module interprets either signal as *not-a-number* and initiates its own configured failsafe action for the control system.

4.4.2 Procedure to Establish Failsafe Operation



The failsafe direction display accessible via the Toolkit shows only the state of the jumper as it correlates to analog transmitter operation. Failsafe action for the DE control system may be configured to operate in a manner different from analog, as indicated by the state of the transmitter jumper.



The integrated circuits in the transmitter PWA are vulnerable to damage by stray static discharges when removed from the Electronics Housing. Minimize the possibility of static discharge damage when handling the PWA as follows:

Do not touch terminals, connectors, component leads, or circuits when handling the PWA.

When removing or installing the PWA, handle it by its edges or bracket section only. If you need to touch the PWA circuits, be sure you are grounded by staying in contact with a grounded surface or by wearing a grounded wrist strap.

When the PWA is removed from the transmitter, put it in an electrically conductive bag, or wrap it in aluminum foil to protect it.

The following procedure outlines the steps for positioning the write protect and failsafe jumpers on the electronics module. See [Figure 22](#) for the locations of the failsafe and write protect jumpers.

Note: The Fieldbus variant has simulation and write protect jumpers in the same location and their positions are described in [Table 14](#) – Fieldbus Simulation and Write Protect Jumpers. See Section 4.4.3, Write Protect Jumper on Foundation Fieldbus (FF)

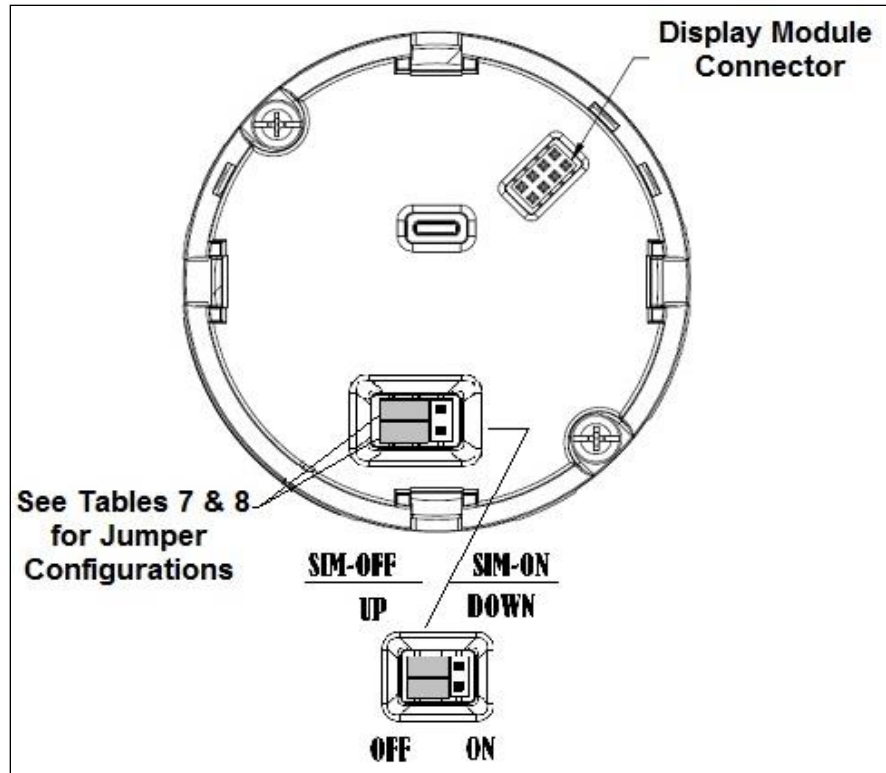


Figure 22 – Locating the Failsafe and Write Protect Jumpers

Table 13 – HART and DE Failsafe and Write Protect Jumpers

Jumper Arrangements	Description
	Failsafe = UP (High) Write Protect = OFF (Not Protected)
	Failsafe = DOWN (Low) Write Protect = OFF (Not Protected)
	Failsafe = UP (High) Write Protect = ON (Protected)
	Failsafe = Down (Low) Write Protect = On (Protected)

1. Turn OFF transmitter power (Power removal is only required in accordance with area safety approvals. Power removal is only required in Class 1 Div 1 Explosionproof and Class 1 Div 2 environments).
2. Loosen the end cap lock, and unscrew the end cap from the electronics side of the transmitter housing.
3. If equipped with a Display module, carefully depress the two tabs on the sides of the Display Module, and pull it off.

4. If necessary, unplug the interface connector from the Communication module. Do not discard the connector.
5. Set the Failsafe Jumper (top jumper) to the desired position (UP or DOWN). See [Table 13](#) and [Figure 22](#) for jumper positioning.
6. If applicable, re-install the Display module as follows:
 - Orient the display as desired.
 - Install the Interface Connector in the Display module such that it will mate with the socket for the display in the Communication module.
 - Carefully line up the display, and snap it into place. Verify that the two tabs on the sides of the display latch.

NOTE: Installing a Display Module into a powered transmitter may cause a temporary upset to the loop output value.



Orient the Display for proper viewing through the end cap window.
You can rotate the meter mounting orientation in 90° increments.

7. Restore transmitter power if removed.

4.4.3 Write Protect Jumper on Foundation Fieldbus (FF)

On Foundation Fieldbus transmitters there is no Failsafe jumper selection but there is a Write Protect jumper. The bottom jumper sets the Write Protect. The default setting is OFF (Un-protected). When set to the On (Protected) position, Changed configuration parameters cannot be written to the transmitter. When set to the OFF (Un-protected) position, Changed configuration parameters can be written to the transmitter.



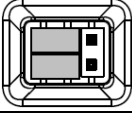
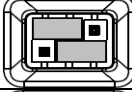
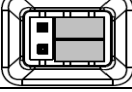
	ATTENTION: Electrostatic Discharge (ESD) hazards. Observe precautions for handling electrostatic sensitive devices.
	WARNING! PERSONAL INJURY: Risk of electrical shock. Disconnect power before proceeding. HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 VDC may be accessible. Failure to comply with these instructions could result in death or serious injury.
Step	Action
1	Turn OFF transmitter power.
2	Loosen the end-cap lock, and unscrew the end cap from the Electronics side of the transmitter housing.
3	If applicable, carefully depress the tabs on the sides of the Display Module and pull it off. If necessary, move the interface connector from the Communication Module to the display module to provide the preferred orientation of the display module in the window.
4	Set the Write Protect jumper (Bottom jumper) to the desired behavior (Protected or Unprotected). See Table 14 for jumper positioning.
5	Screw on the end cap and tighten the end-cap lock.
6	Turn ON transmitter power.

Table 14 – Fieldbus Simulation and Write Protect Jumpers

Image	Description
	Fieldbus Simulation Mode = OFF Write Protect = OFF (Not Protected)
	Fieldbus Simulation Mode = OFF Write Protect = ON (Protected)
	Fieldbus SIM Mode = ON Write Protect = OFF (Not Protected)

4.5. Monitoring the Basic and Advanced Displays

This section describes the information shown on the operator screens of the Advanced and Basic Displays.

4.5.1 Basic Display

Figure 23 illustrates the Basic Display format with Process Variable (PV).

- The PV value is user-configurable. This field has 7 characters. The maximum allowable numeric value is 9999999 or -999999. If fractional decimals are configured, the fractional positions will be dropped, as required. If the PV value exceeds the above limits, it is divided by 1000 and “K” is appended to the result, allowing a maximum value with multiplier of 999999K or -99999K.
- Process Variable Tag is user-configurable from a HART Host. This field has 14 characters.
- Engineering Units. This field is user-configurable when measuring temperature. (Custom Units option is available for Fieldbus only)



Figure 23 – Basic Display with Process Variable Format

4.5.2 Advanced Displays

As shown in Figure 24, the Advanced Display provides three formats. Table 15 lists and describes the fields in each of the three Advanced Display formats. Essentially, all three formats provide the same information, but with the following differences:

- Bar Graph. User Configurable 126 segment Bar Graph with range settings. The Bar Graph displays the current value of the configured PV.
- PV Trend. User-configurable display period from one hour to 999 hours (allowing 31 days). The chart displays minimum, maximum, and average of the configured PV over the selected trend period.

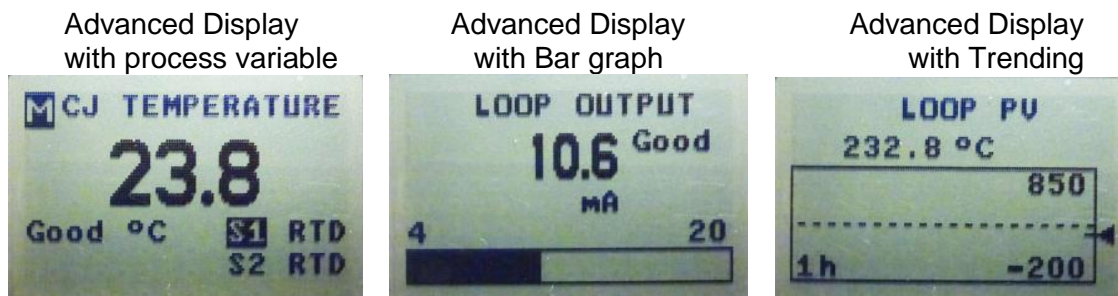





Figure 24 – Advanced Display Formats with the Process Variable

Table 15 – Advanced Displays with PV Format Display Indications

Display Indicator	What It Means
<p data-bbox="196 655 354 711">Diagnostic / Maintenance</p> <p data-bbox="196 747 461 953">These indicators are displayed in the upper left corner of the screen when the associated conditions are present in the transmitter.</p>	<p data-bbox="498 655 1375 835">D Diagnostic condition present This indicator is displayed any time a diagnostic is present in the transmitter, either Critical or Non-Critical. If a Critical Diagnostic is present, the message “Critical Diag” will flash at the top of the screen and the appropriate Diagnostic screen will be inserted into the normal screen rotation.</p> <div data-bbox="550 865 1328 1104" style="display: flex; justify-content: space-around;">   </div> <p data-bbox="592 1136 1338 1291">To determine which Non-Critical diagnostics are active, use the local buttons to call up the Non-Critical diagnostics menu (Main Menu\Diagnostics\Non-Critical). Refer to Table 10Table 10 for details concerning the Non-Critical diagnostics.</p> <p data-bbox="498 1325 1359 1507">M Maintenance Mode is active For HART and DE, this indicator is set by the Experion DCS. For Fieldbus, the transmitter internally sets this mode. When this Mode is active, a screen with the text “Available for Maintenance” will be inserted into the normal screen rotation to make it easy to identify transmitters that are available for maintenance.</p> <div data-bbox="774 1537 1195 1808" style="text-align: center;">  </div>

PV Value	<p>User Configurable. This field has 7 characters. Maximum allowable numeric value of 9999999 or -999999. If fractional decimals are configured, the fractional positions will be dropped as required. If the PV exceeds the values above limits, the PV is divided by 1000 and "K" is appended to the result, allowing a maximum value with multiplier of 999999K or -99999K</p>
PV Status:	<p>Good The transmitter is operating normally</p> <p>Bad The transmitter has detected a fault condition. The PV Status field will flash when this condition is present and the PV Value will be displayed on a black background as shown below:</p> <div data-bbox="789 621 1182 869" data-label="Image"> </div> <p>Unc Uncertain (this status is only available for Fieldbus transmitters) The PV Value is outside of normal limits.</p>

PV Function Block Mode	The Function Block Mode is only displayed for Foundation Fieldbus transmitters. The eight possible Modes are shown below.	
	OOS Out Of Service Auto Automatic Man Manual Cas Cascade	RCas Remote Cascade Rout Remote Output IMan Initialization Manual LO Local Override
Process Variable Tag	User Configurable. This field has 14 characters	
Engineering Units	User Configurable. This field has 2 characters in case of HART and DE Note: In case of Fieldbus, this field has 8 characters to configure Custom Units , which is applicable when Units configured to “Custom” from host)	
	$^{\circ}$ C $^{\circ}$ F $^{\circ}$ R K (Kelvin)	Other: (%) percent (mV) millivolt mA (milliampere) Custom - applicable to FF only
Bar Graph	The limits of the bar graph are user-configurable for each screen.	
Trend graph	The limits of the trend graph are user-configurable for each screen. The amount of time visible on the Trend graph is also configurable.	

4.5.3 Button operation during monitoring

When the operator screens are active on the Advanced Display, the Increment and Decrement buttons (\uparrow and \downarrow) can be used to move to the next or previous operator screen without waiting for the rotation time to expire. Pressing the Enter button (\leftarrow) will call up the Main Menu.

5 Maintenance

5.1. Overview

This section provides information about preventive maintenance and replacing damaged parts. The topics covered in this section are:

- Replacement of damaged parts such as the Electronics Modules.

5.2. Preventive Maintenance Practices and Schedules

The STT850 SmartLine Transmitter does not require any specific maintenance at regularly scheduled intervals.

Maintenance of the STT850 is limited to ensuring that connections, seals and mounting are tight and secure. There are no moving parts or adjustments and hence no reason to open the field housing except to inspect for corrosion or conductive dust entry which could later affect reliable operation. The transmitter modules themselves should never be opened.

5.3. Replacing the Communication Module

The Communication module includes a connector to the optional Display module. This section includes the procedure to replace the Communication module.



The transmitter does not have to be removed from service to replace the Comm Module



Please take appropriate steps to avoid ESD damage when handling the Communication and Display Module assemblies

Refer to [Figure 25](#) for parts locations.

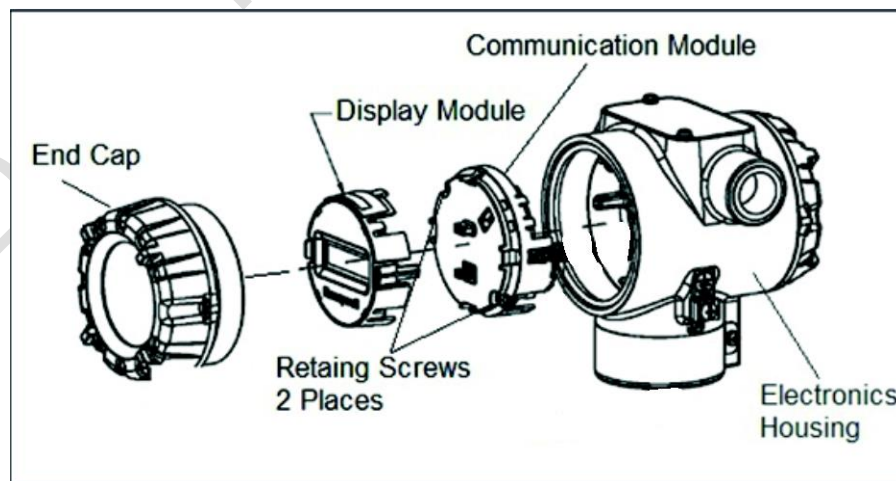


Figure 25 – PWA Replacement

1. Turn OFF transmitter power (Power removal is only required in accordance with area safety approvals. Power removal is only required in Class 1 Div 1 Explosionproof and Class 1 Div 2 environments).
 - When removing the Communications Module with power applied, the loop will go to 0V. Likewise, installing a Communications Module into a transmitter with power applied will cause the loop output value to go to 12 ma for several seconds then the loop output value will go to the configured value based on the PV input.
 - Installing a Display Module into a powered transmitter may cause a temporary upset to the loop output value.
2. Loosen the end cap lock, and unscrew the end cap from the electronics side of the transmitter housing.
3. If equipped with a Display module, carefully depress the two tabs on the sides of the Display Module, and pull it off.
4. If necessary, unplug the Display interface connector from the Communication module. **Do not discard the connector.**
5. Loosen the two retaining screws, and carefully pull the Communication module from the Electronics compartment.
6. Carefully, insert the Communication module into the Electronics compartment.
7. Tighten the two Communication module retaining screws.
8. Refer to the SmartLine User's Manual to change the FAILSAFE (HART and DE only), READ/WRITE, and SIM-OFF/SIM-ON configuration settings.
9. If applicable, re-install the Display module as follows:
 - a) Orient the display as desired.
 - b) Install the Interface Connector in the Display module such that it will mate with the socket for the display in the Communication module.
 - c) Carefully line up the display, and snap it into place. Verify that the two tabs on the sides of the display latch.



h Orient the Display for proper viewing through the end cap window. You can rotate the meter mounting orientation in 90° increments.

10. Apply Parker Super O-ring Lubricant or equivalent to the end cap O-ring before installing the end cap. Reinstall the End Cap and tighten the End Cap locking screw.
11. Installing Optional External Configuration Button Assembly.
 - a) Loosen (Do Not Remove) both top nameplate screws and pivot nameplate 90°.
 - b) Align the protrusion on the button assembly with the matching opening in the housing and snap the button assembly into the housing.
 - c) Rotate the nameplate back to the original position, and tighten the nameplate screws.

(Steps 13 - 16 required for Field Upgrades Only)

12. Loosen the End Cap locking screw and unscrew the End Cap from the Field Wiring side of the transmitter housing.
13. Select the proper Communication/External Configuration upgrade kit label from the label strip provided and adhere to the inside of the Field Wiring compartment End Cap.
14. Apply Parker Super O-ring Lubricant or equivalent to the end cap o-ring before installing the end cap. Reinstall the End Cap and tighten the end cap locking screw
15. Install external upgrade label (i.e. DEVICE MODIFIED.....) provided on outside of housing as shown in [Figure 25](#).
16. Restore power if removed.
17. Check the settings of the Transmitter Setup and Display Setup parameters to make sure that the transmitter is configured correctly for your application. Refer to the STT850 HART/DE manual (34-TT-25-06) for details on HART and DE transmitters. Refer to STT850 Fieldbus manual (34-TT-25-07) for additional information about Fieldbus transmitters.
18. If applicable, verify External Button Configuration operation.

Installation is complete.

6 Calibration

6.1. Recommendations for Transmitter Calibration

The STT850 SmartLine Temperature Transmitter does not require periodic calibration to maintain accuracy. Typically, calibration of a process-connected transmitter will degrade, rather than augment the capability of a smart transmitter. For this reason, it is recommended that a transmitter be removed from service before calibration. Moreover, calibration must be accomplished in a controlled, laboratory-type environment, using certified precision equipment.

6.2. Calibration Procedures

For a transmitter operating in analog mode, you must calibrate its output signal measurement range using any compatible hand-held communicator or a local display.

One calibration option is to use the Honeywell MC Toolkit (MCT). Refer to the *MC Toolkit User Manual*, Document # 34-ST-25-20.

Calibration information and procedures for a transmitter operating in the HART/DE mode are provided in the *STT850 Series HART/DE Option User's Manual*, document number 34-TT-25-06, Section on "Calibration." For Foundation Fieldbus calibration information refer to Foundation Fieldbus STT850 Temperature Transmitter User's Guide, 34-TT-25-07

7 Troubleshooting

7.1. Overview

Troubleshooting involves responding to error messages, primarily displayed by the MC Toolkit. Error messages that may occur on the transmitter's local display are fairly self-explanatory and intuitive. However, this section covers the diagnostic messages that indicate critical conditions. Other than the critical conditions, additional detail is not provided. If you require assistance, contact your distributor or Honeywell Technical Support. All other messages are covered by the MC Toolkit Users' Manual.

7.2. Critical Diagnostics Screens

When a Critical Diagnostic is present in the transmitter, the Advanced Display will show one or more of the screens pictured in Figure 26. These screens will be inserted into the normal screen rotation and displayed between the user-defined operator screens. A description of the diagnostic conditions is given Table 16, along with suggested actions for resolving the problem.

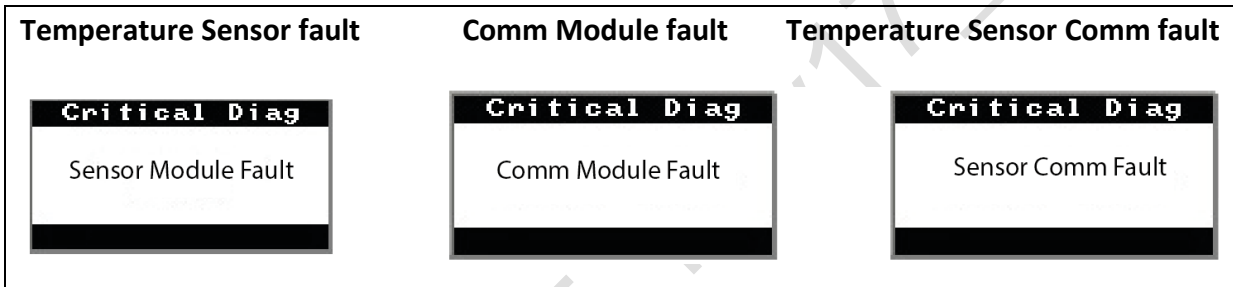


Figure 26 – Local Display Fault Diagnostic Conditions

The Basic Display will display the message CRITICAL FAULT on the top line of the LCD and the appropriate diagnostic text on the lower line.

7.1.1 Fault Conditions and Recommended Corrective Actions

Table 16 – Fault Conditions and Recommended Corrective Actions.

Condition	Analysis	Recommended Corrective Action
<p>Electronics Module Fault. A critical failure has been detected on the HART, DE, or Fieldbus Electronics Module.</p>	<p>Use a HART, DE, or Fieldbus communicator to read the detailed status information from the transmitter. Refer to the appropriate communicator manual for more information about the possible failure causes.</p>	<p>Cycle power to the transmitter. If the problem continues to occur replace the Electronics Module.</p>
<p>Temperature Sensor Module Fault. A critical failure has been detected on the Temperature Sensor Module.</p>	<p>Use a HART, DE, or Fieldbus communicator to read the detailed status information from the transmitter. Refer to the appropriate communicator manual for more information about the possible failure causes.</p>	<p>If the diagnostic status indicates an input problem (burnout, out of range, etc.), correct the root error and then cycle power to the transmitter. If the problem continues to occur replace the Temperature Sensor Module.</p>
<p>Temperature Sensor Comm Fault. Cannot communicate with the Temperature Sensor Module.</p>	<p>Use a HART, DE, or Fieldbus communicator to read the detailed status information from the transmitter. Refer to the appropriate communicator manual for more information about the possible failure causes.</p>	<p>Cycle power to the transmitter. If the problem continues to occur replace the Temperature Sensor Module</p>

8 Parts List

8.1. Overview

Individually saleable parts for the various transmitter models are listed in this section. Some parts are illustrated for identification. Parts are identified and listed in the corresponding tables as follows:

- Individually saleable parts are indicated in each figure by key number callout.
- Parts that are supplied in kits are indicated in each illustration by key number callout with the letter K prefix.

Table 17 is a summarized list of recommended spare parts.

Table 17 – Summary List of Recommended Spare Parts

Part Number	Description	Figure No.	Key No.	1-10 Units	10-100 Units	100-1000 Units
Electronics Housing Assembly						
50086423-501	HART Electronics Module Without REED Sensor PWA	Figure 28	5	1	1-2	2-4
50086423-502	HART Electronics Module With REED Sensor PWA					
50086423-503	DE Electronics Module Without REED Sensor PWA					
50086423-504	DE Electronics Module With REED Sensor PWA					
50086423-505	FieldBus Electronics Module Without REED Sensor PWA					
50086423-506	FieldBus Electronics Module With REED Sensor PWA					
50049911-502	Basic Display Module	Figure 29	4	1	1-2	2-4
50049846-503	Advanced Display Module					
50087087-503	Advanced Display Module, East Asia (CH, JP)					
50086421-501	HART/DE Temperature/Terminal Block Assy Without Lightning Protection, Single Input	Figure 29	3	1	1	1-2
50086421-502	HART/DE Temperature/Terminal Block Assy Without Lightning Protection, Dual Input					
50086421-503	HART/DE Temperature/Terminal Block Assy With Lightning Protection, Single Input					
50086421-504	HART/DE Temperature/Terminal Block Assy With Lightning Protection, Dual Input					
50086421-505	HART/DE Temperature/Terminal Block Assy Without Lightning Protection, Single Input w/Digital Output					
50086421-506	HART/DE Temperature/Terminal Block Assy With Lightning Protection, Single Input, w/Digital Output					
50086421-507	FieldBus Temperature/Terminal Block Assy Without Lightning Protection, Single Input	Figure 29	3	1	1	1-2
50086421-508	FieldBus Temperature/Terminal Block Assy Without Lightning Protection, Dual Input					
50086421-509	Temperature/Terminal Block Assy With Lightning Protection, Single Input					
50086421-510	FieldBus Temperature/Terminal Block Assy With Lightning Protection, Dual Input					

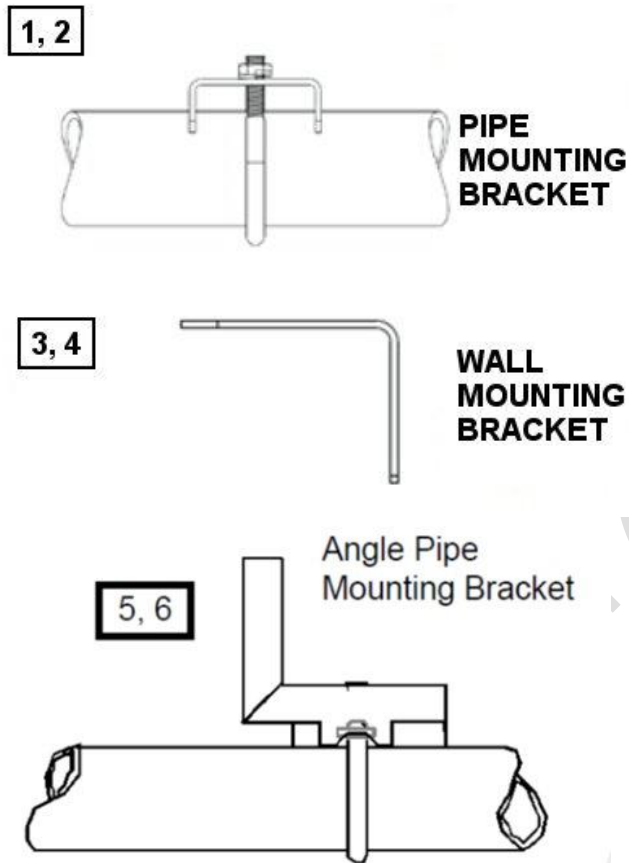


Figure 27 – Pipe and Wall Bracket Parts

Pipe Mounting Bracket	Carbon Steel
Pipe Mounting Bracket	316 SS
Angle Pipe Mounting Bracket	Carbon Steel
Angle Pipe Mounting Bracket	316 SS
Marine Approved Mounting Bracket	316 SS
Wall Mounting Bracket	Carbon Steel
Wall Mounting Bracket	316 SS

Table 18 – Pipe, Wall and Angle Bracket Parts
(Refer to [Figure 27](#))

Key No.	Part Number	Description	Quantity Per Unit
1	50090524-501	Carbon Steel Pipe Bracket Mounting kit for all models	1
2	50090524-503	316 Stainless Steel Pipe Bracket Mounting kit for all models	1
3	50092363-501	Carbon Steel Wall Bracket Mounting kit for all models	1
4	50092363-503	316 Stainless Steel Wall Bracket Mounting kit for all models	1
5	30752770-007	Carbon Steel Angle Pipe Bracket Mounting kit for all models	1
6	30752770-407	316 Stainless Steel Angle Pipe Bracket Mounting kit for all models	1

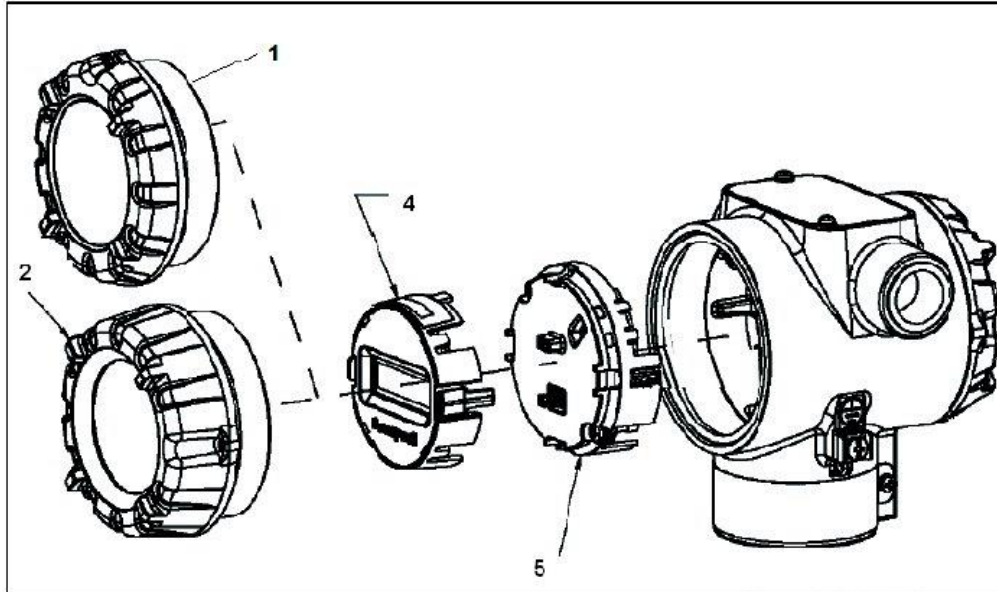


Figure 28 – Electronic Housing, Display End

Table 19 – Transmitter Major Assemblies

(Refer to [Figure 28](#) and [Figure 29](#))

Key No.	Part Number	Description	Quantity Per Unit
1	50049858-501	End Cap (Aluminum)	1
	50049858-521	End Cap (Stainless Steel)	
2	50049832-501	End Cap, Display (Aluminum)	1
	50049832-521	End Cap, Display (Stainless Steel)	
3	50086421-501	HART/DE Temperature/Terminal Block Assy Without Lightning Protection, Single Input	1
	50086421-502	HART/DE Temperature/Terminal Block Assy Without Lightning Protection, Dual Input	
	50086421-503	HART/DE Temperature/Terminal Block Assy With Lightning Protection, Single Input	
	50086421-504	HART/DE Temperature/Terminal Block Assy With Lightning Protection, Dual Input	
	50086421-505	HART/DE Temperature/Terminal Block Assy Without Lightning Protection, Single Input w/Digital Output	
	50086421-506	HART/DE Temperature/Terminal Block Assy With Lightning Protection, Single Input,w/Digital Output	
	50086421-507	FieldBus Temperature/Terminal Block Assy Without Lightning Protection, Single Input	
	50086421-508	FieldBus Temperature/Terminal Block Assy Without Lightning Protection, Dual Input	
	50086421-509	FieldBus Temperature/Terminal Block Assy With Lightning Protection,Single Input	
	50086421-510	FieldBus Temperature/Terminal Block Assy With Lightning Protection,Dual Input	
4	50049911-502	Basic Display for Temperature	1
	50049846-503	Advanced Display for Temperature	

5	50086423--501 50086423--502 50086423--503 50086423--504 50086423--505 50086423--506	HART Electronics Module Assembly (PWA) without Reed sensor HART Electronics Module Assembly (PWA) with Reed sensor DE Electronics Module Assembly (PWA) without Reed sensor DE Electronics Module Assembly (PWA) with Reed sensor FF Electronics Module Assembly (PWA) without Reed sensor FF Electronics Module Assembly (PWA) with Reed sensor	1
6	50049915-501	External Zero, Span & Config Buttons (HART and DE)	1
K1	30757503-005	Electronics housing seals kit (includes O-rings)	

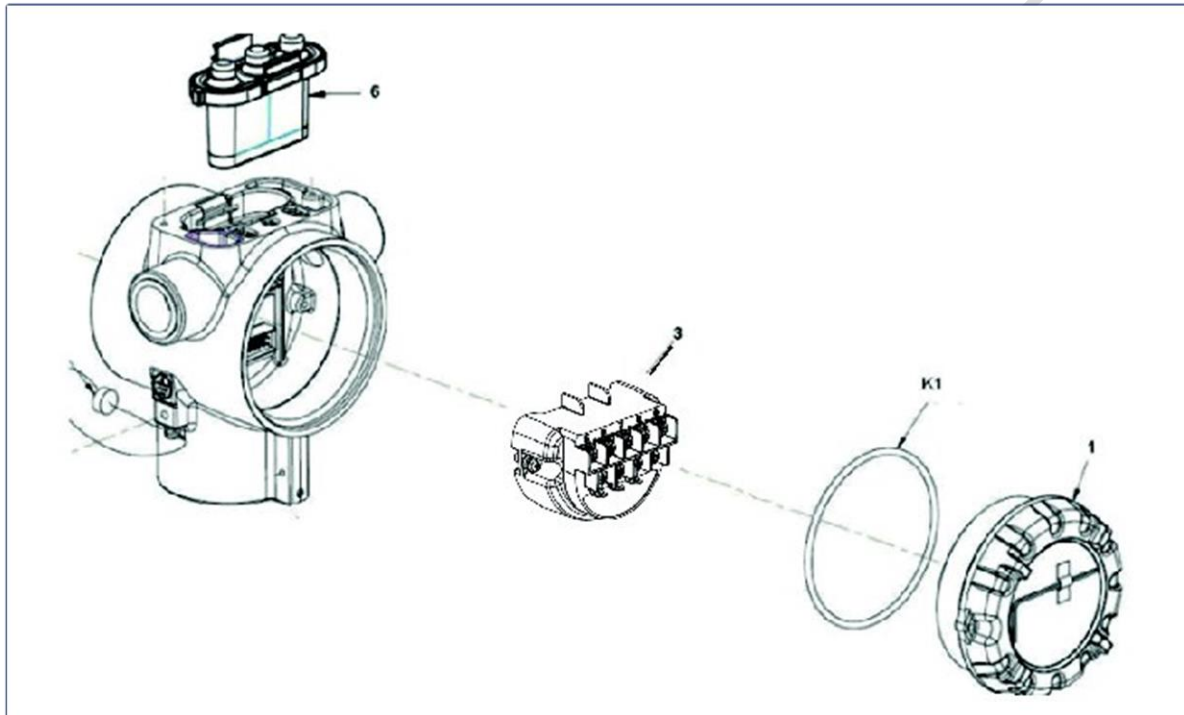


Figure 29 – Electronic Housing, Terminal Block End

Appendix A. PRODUCT CERTIFICATIONS

A1. Safety Instrumented Systems (SIS) Installations

For Safety Certified Installations, please refer to STT850/750 Safety Manual 34-TT-25-05 for installation procedure and system requirements.

A2. European Directive Information (EU)



50094560 Revision: E

EC DECLARATION OF CONFORMITY

We,

Honeywell International Inc.
Honeywell Field Solutions
512 Virginia Drive
Fort Washington, PA 19034 USA

declare under our sole responsibility that the following products,

STT 850 – Smart Series Temperature Transmitter
STT 750 – Smart Series Temperature Transmitter

to which this declaration relates, is in conformity with the provisions of the European Community Directives, including the latest amendments, as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and when applicable or required, a European Community notified body certification, as shown in the attached schedule.

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

Owen J. Murphy
Product Safety & Approvals Engineering

Issue Date: 24 July 2015

SCHEDULE

50094560 Revision: E

EMC Directive (2004/108/EC)

IEC 61326-1:2005 Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements.

IEC 61326-3-1:2008 Electrical Equipment for Measurement, Control and Laboratory Use- Part 3-1: Immunity Requirements for safety related systems and equipment intended to perform safety-related functions.

Overview of EMC Testing
Equipment Tested (EUT): ST 850 TRANSMITTER

Summary of Tests Performed:

PORT	TEST	STANDARD	CRITERIA (IEC 61326-1)	CRITERIA (IEC 61326-3-1)	RESULTS
Enclosure	Radiated Emission	CISPR 11	Group1, Class A 30 – 230 MHz: 40 dB 230 – 1000 MHz: 47 dB	Group1, Class A 30 – 230 MHz: 40 dB 230 – 1000 MHz: 47 dB	PASS
	ESD Immunity	IEC61000-4-2	+/- 4KV Contact +/- 8KV Air	+/- 6KV Contact +/- 8KV Air	PASS
	EM Field- RF Radiated Susceptibility	IEC61000-4-3	10 V/m- 80 MHz to 1GHz 3 V/m - 1.4 GHz to 2.0 GHz 1 V/m- 2.0 GHz to 2.7 GHz	20 V/m- 80MHz to 1GHz 10 V/m - 1.4GHz to 2.0 GHz 3 V/m- 2.0GHz to 2.7GHz	PASS PASS PASS
	50Hz/60Hz Magnetic Field Immunity	IEC 6100-4-8	30 A/m	30 A/m	N/A 1
DC Power	EFT(B) Immunity	IEC61000-4-4	+/- 1KV	+/- 2KV	PASS
	Surge Immunity	IEC61000-4-5	+/- 1KV	+/- 2KV	PASS
	RF Conducted Susceptibility	IEC61000-4-6	3V	3 V Except the following: 10 V 3.39 to 3.410MHz 10 V 6.765 to 6.795MHz 10 V 13.553 to 13.567MHz 10 V 26.957 to 27.283MHz 10 V 40.66 to 40.70MHz	PASS

SCHEDULE

50094560 Revision: E

PORT	TEST	STANDARD	CRITERIA (IEC 61326-1)	CRITERIA (IEC 61326-3-1)	RESULTS
I/O Signal/ Control (Including Earth Lines)	EFT(Burst) Immunity	IEC61000-4-4	+/- 1KV	+/- 2KV	2
	Surge Immunity	IEC61000-4-5	+/- 1KV	+/- 2KV	2
	RF Conducted Susceptibility	IEC61000-4-6	3V	3 V Except the following: 10 V 3.39 to 3.410MHz 10 V 6.765 to 6.795MHz 10 V 13.553 to 13.567MHz 10 V 26.957 to 27.283MHz 10 V 40.66 to 40.70MHz	2
AC Power	Voltage Dip	IEC61000-4- 11	0% during 1 Cycle 40% during 10-12 Cycles 70% during 25-30 Cycles		N/A ³
	Short Interruptions	IEC61000-4- 11	0% during 250-300 Cycles		N/A ³
	EFT(Burst) Immunity	IEC61000-4-4	2KV		N/A ³
	Surge Immunity	IEC61000-4-5	1KV/ 2KV		N/A ³
	RF Conducted Susceptibility	IEC61000-4-6	3V		N/A ³

1. There is no magnetic sensitive circuitry.
2. Done as part of the DC Power Testing.
3. Product is DC Powered.

SCHEDULE

50094560 Revision: E

ATEX Directive (94/9/EC)

EC-Type Examination Certificate No: SIRA 14ATEX0020X

Protection : Flameproof “d” and Intrinsically Safe “ia” Certificate

EN 60079-0: 2012 EN 60079-1: 2007 EN 60079-11: 2011
EN 60079-26: 2006 EN 60079-31: 2009

Type Examination Certificate No: SIRA 14ATEX4052X

Protection : Non Sparking “n” Certificate

EN 60079-0: 2012 EN 60079-15: 2010

ATEX Notified Body for EC Type Certificates

SIRA Certification Service
Rake Lane, Eccleston
Chester, CH4 9JN
England

ATEX Notified Body for Quality Assurance

DEKRA Certification B.V. [Notified Body Number: 0344]
Maender 1051
6825 MJ Arnhem
The Netherlands

A3. Hazardous Locations Certifications

MSG CODE	AGENCY	TYPE OF PROTECTION	COMM OPTION	Electrical Parameters	Ambient Temperature	
A	FM Approvals™ (USA)	Explosion proof , Certificate: FM16US0157X: Class I, Division 1, Groups A, B, C, D; Dust Ignition Proof: Class II, III, Division 1, Groups E, F, G; T6..T5 Class 1, Zone 1, AEx d IIC T6..T5 Gb Class 2, Zone 21, AEx tb IIIC T 95°C IP 66 Db	4-20 mA/ DE/HART/ FF/ PROFIBUS	Note 1	T5: Ta= -50°C to 85°C T6: Ta= -50°C to 65°C	
		Intrinsically Safe , Certificate: FM16US0157X: Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T4 Class I Zone 0 AEx ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA/ DE/HART /FF/ PROFIBUS	Note 2	-50°C to 70°C	
		Non-Incendive , Certificate: FM16US0157X: Class I, Division 2, Groups A, B, C, D; T4 Class I Zone 2 AEx nA IIC T4 Gc AEx nA IIC T4	4-20 mA/ DE/HART /FF/ PROFIBUS	Note 1	-50°C to 85°C	
		Standards: FM 3600:2011; ANSI/ ISA 60079-0: 2013 FM 3615:2006; ANSI/ ISA 60079-1 : 2015 FM 3616 : 2011 ; ANSI/ ISA 60079-31 : 2015 FM 3610:2010; ANSI/ ISA 60079-11 : 2014 FM 3810 : 2005 ; FM 3611:2004; ANSI/ ISA 60079-15 : 2012 ; FM 3810 : 2005 ; NEMA 250 : 2003 ; ANSI/ IEC 60529 : 2004				
		Enclosure: Type 4X/ IP66/ IP67	ALL	ALL	ALL	

B	CSA-Canada	Explosion proof , Certificate: 2689056: Class I, Division 1, Groups A, B, C, D; Dust Ignition Proof: Class II, III, Division 1, Groups E, F, G; T4 Zone 1 Ex d IIC T4 Gb Ex tb IIIC T 95°C IP 66 Db DIP A21 Class II, III	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Intrinsically Safe , Certificate: 2689056: Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T4 Ex ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA/ DE/HART/ FF	Note 2	-50°C to 70°C
		Non-Incendive , Certificate: 2689056: Class I, Division 2, Groups A, B, C, D; T4 Class I Zone 2 Ex nA IIC T4 Gc Ex nA IIC T4 Gc	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Enclosure: Type 4X/ IP66/ IP67	ALL	ALL	ALL
		Standards: CSA C22.2 No. 0-10; CSA 22.2 No. 25-1966 (reaffirmed 2009); CSA C22.2 No. 30-M1986 (reaffirmed 2012); CSA C22.2 No. 94-M91; CSA C22.2 No. 142-M1987 (reaffirmed 2009); CSA-C22.2No.157-92 (reaffirmed 2012); C22.2 No. 213-M1987(reaffirmed 2012); C22.2 No. 60529-05 C22.2 No. CSA 60079-0:2011; C22.2 No. 60079-1: 2011; C22.2 No. 60079-11: 2011; C22.2 No. 60079-15: 2012; C22.2 No. 60079-31: 2012; ANSI/ ISA12.12.01-2012; ANSI/ ISA 60079-0 (12.00.01): 2009 ; ANSI/ ISA 60079-1 (12.22.01): 2009 ; ANSI/ ISA 60079-11(12.02.01) : 2012; ANSI/ ISA 60079-26 (12.00.03) : 2011; ANSI/ ISA 60079-15(12.12.02) : 2012 ; ANSI/ ISA 60079-27 (12.02.04) : 2006; ANSI/ ISA 60079-31(12.10.03) : 2009 ; FM Class 3615: Aug 2006; FM Class 3616: Dec 2011; ANSI/ IEC 60529 : Edition 2.1 ANSI/ UL 913: Edition 7; ANSI/ UL 916 : Edition 4 ;			

C	ATEX	Flameproof , Sira 14ATEX2046X: II 2 G Ex d IIC T4 Gb II 2 D Ex tb IIIC T 95°C Db IP 66/ IP67	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Intrinsically Safe , Sira 14ATEX2046X: II 1 G Ex ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA/ DE/HART/ FF	Note 2	-50°C to 70°C FISCO: -50°C to 45°C
		Enclosure: IP66/ IP67	ALL	ALL	ALL
		Standards: EN 60079-0: 2012; EN 60079-1 : 2007; EN 60079-31 : 2009 EN 60079-11: 2011; EN 60079-26 : 2006; EN 60529 : 2000 + A1			
		Non Sparking , Sira 14ATEX4052X: II 3 G Ex nA IIC T4 Gc	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Enclosure: IP66/ IP67	ALL	ALL	ALL
		Standards: EN 60079-0: 2012; EN 60079-15 : 2010; IEC 60529 : 2009 with Corr 3			
D	IECEX	Flameproof , SIR 14.0020X Ex d IIC T4 Gb Ex tb IIIC T 95°C IP 66/ IP67	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Intrinsically Safe , SIR 14.0020X Ex ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA/ DE/HART/ FF	Note 2	-50°C to 70°C FISCO: -50°C to 45°C
		Non Sparking , SIR 14.0020X Ex nA IIC T4 Gc	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Enclosure: IP66/ IP67	ALL	ALL	ALL
		Standards: IEC 60079-0: 2011, Edition 6; IEC 60079-1 : 2007-04, Edition 6; IEC 60079-11 : 2011, Edition 6; IEC 60079-15 : 2010, Edition 4 IEC 60079-26 : 2006, Edition 2; IEC 60079-31 : 2008, Edition 1 IEC 60529 : 2009 with Corr 3			
E	SAEx (South Africa)	Flameproof: Ex d IIC T4 Gb Ex tb IIIC T 85°C IP 66 Db	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Intrinsically Safe: Ex ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA/ DE/HART/ FF	Note 2	-50°C to 70°C
		Non Sparking: Ex nA IIC T4 Gc	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Enclosure: IP66/ IP67	ALL	ALL	ALL

F	INMETRO	Flameproof: Ex d IIC T4 Gb Ex tb IIIC T 95°C IP 66 Db	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Intrinsically Safe: Ex ia IIC T4 Ga FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA/ DE/HART/ FF	Note 2	-50°C to 70°C
		Non Sparking: Ex nA IIC T4 Gc	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Enclosure: IP66/ IP67	ALL	ALL	ALL
G	NEPSI (CHINA)	Flameproof: Ex d IIC T4 Gb Ex tb IIIC T 85°C IP 66	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Intrinsically Safe: Ex ia IIC T4 FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA/ DE/HART/ FF	Note 2	-50°C to 70°C
		Non Sparking: Ex nA IIC T4	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Enclosure: IP66/ IP67	ALL	ALL	ALL
H	KOSHA (KOREA)	Flameproof: Ex d IIC T4 Gb Ex tD A21 T 95°C IP 66/ IP67	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Intrinsically Safe: Ex ia IIC T4 FISCO Field Device (Only for FF Option) Ex ia IIC T4	4-20 mA/ DE/HART/ FF	Note 2	-50°C to 70°C
		Enclosure: IP66/ IP67	ALL	ALL	ALL
J	EAC Ex (Russia, Belarus and Kazakhstan)	Flameproof: 1 Ex d IIC T4 Gb Ex tb IIIC T95°C Db	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Intrinsically Safe: 0 Ex ia IIC T4 Ga Ex ia IIIC T4 Db FISCO Field Device (Only for FF Option) 0 Ex ia IIC T4	4-20 mA/ DE/HART/ FF	Note 2	-50°C to 70°C FISCO: -50°C to 45°C
		Non Sparking: 2 Ex nAc IIC T4	4-20 mA/ DE/HART/ FF	Note 1	-50°C to 85°C
		Enclosure: IP66/ IP67	ALL	ALL	ALL

Notes

1. Operating Parameters:

4-20 mA/DE/HART (Loop Terminal)

Voltage= 11 to 42 V Current= 4-20 mA Normal (3.8 – 23 mA Faults)

FF (Loop Terminal)

Voltage= 9 to 32 V Current= 25 mA

2. Intrinsically Safe Entity Parameters

Terminals 1 and 2- LOOP: $U_i = 30$ Vdc, $I_i = 225$ mA, $P_i = 900$ mW, $C_i = 4$ nF, $L_i = 0$ μ H

Terminals 5, 6, 7, 8, 9- SENSOR: $C_i = 4$ nF, $L_i = 0$ μ H

DIGITAL OUTPUT OPTION:

Terminals 1 and 2- LOOP: $U_i = 30$ Vdc, $I_i = 225$ mA, $P_i = 900$ mW, $C_i = 4$ nF, $L_i = 0$ μ H

Terminals 4 and 9, DO OPTION: $U_i = 30$ Vdc, $I_i = 40$ mA, $P_i = 500$ mW, $C_i = 4$ nF, $L_i = 0$ μ H

Terminals 5, 6, 7, 8 - SENSOR: $C_i = 4$ nF, $L_i = 0$ μ H

SIL 2/3 Certification	IEC 61508 SIL 2 for non-redundant use and SIL 3 for redundant use according to EXIDA and TÜV Nord Sys Tec GmbH & Co. KG under the following standards: IEC61508-1: 2010; IEC 61508-2: 2010; IEC61508-3: 2010.
MID Approval	Issued by NMI Certin B.V. in accordance with WELMEC guide 8.8, OIML R117.1 Edition 2007 (E), and EN 12405-1+A2 Edition 2006. Applicable to Pt100 sensor only.
MARINE TYPE APPROVAL	Lloyd's Register Certificate Number: 16/60011 Environmental categories ENV1, ENV2, ENV3 and ENV5 as defined in Lloyd's Register Test Specification No. 1, February 2015

A4. Marking ATEX Directive

General:

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

- Name and Address of the manufacturer
- Notified Body identification: DEKRA Quality B.V., Arnhem, the Netherlands

- For complete model number, see the Model Selection Guide for the particular model of Temperature Transmitter.
- The serial number of the transmitter is located on the Housing 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, 0223xxxxxxx indicates that the product was manufactured in 2002, in the 23rd 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 [2] 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.

WARNINGS and Cautions:

Intrinsically Safe and Non-Incendive Equipment:

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR USE IN HAZARDOUS LOCATIONS.

Explosion-Proof/ Flameproof:

WARNING: DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

Non-Incendive Equipment:

WARNING: DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAYBE PRESENT

All Protective Measures:

WARNING: FOR CONNECTION IN AMBIENTS ABOVE 60°C USE WIRE RATED 105°C

A.5 Conditions of Use” for Ex Equipment”, Hazardous Location Equipment or “Schedule of Limitations”:

Consult the manufacturer for dimensional information on the flameproof joints for repair.

Painted surface of the STT850 may store electrostatic charge and become a source of ignition in applications with a low relative humidity less than approximately 30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust or oil. Cleaning of the painted surface should only be done with a damp cloth.

Intrinsically Safe: Must be installed per drawing 50091227

Division 2: This equipment is suitable for use in a Class I, Division 2, Groups A, B, C, D; T4 or Non-Hazardous Locations Only.

The installer shall provide transient over-voltage protection external to the equipment such that the voltage at the supply terminal of the equipment does not exceed 140% of the voltage rating of the equipment.

The enclosure is manufactured from low copper aluminium alloy. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during Installation, particularly if equipment is installed a Zone 0 location.

If a charge-generating mechanism is present, the exposed metallic part on the enclosure is capable of storing a level of electrostatic that could become incendive for IIC gases. Therefore, the user/ installer shall implement precautions to prevent the buildup of electrostatic charge, e.g. earthing the metallic part. This is particularly important if equipment is installed a Zone 0 location.

A.6 Control Drawing

<p style="font-size: small; margin: 0;">COPYRIGHT 2015, HONEYWELL INTERNATIONAL INC. NEITHER THIS DOCUMENT NOR THE INFORMATION CONTAINED HEREIN SHALL BE REPRODUCED, USED OR DISCLOSED TO OTHERS WITHOUT THE WRITTEN AUTHORIZATION OF HONEYWELL. USE, DUPLICATION, OR DISCLOSURE OF THIS DOCUMENT IS SUBJECT TO THE RESTRICTIONS SET FORTH IN A WRITTEN AGREEMENT. NOTHING CONTAINED HEREIN SHALL BE CONSTRUED AS CONFERRING BY IMPLICATION, ESTOPPEL, OR OTHERWISE ANY LICENSE TO ANY PATENT, TRADEMARK, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT OF HONEYWELL OR ANY THIRD PARTY.</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">PRE REL</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td>ISS</td> <td colspan="4">REVISION & DATE</td> <td>APPD</td> </tr> <tr> <td>D</td> <td colspan="4">11/25/2015 ECN 2015-5886</td> <td>OJM</td> </tr> </table>	PRE REL						ISS	REVISION & DATE				APPD	D	11/25/2015 ECN 2015-5886				OJM																		
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D	11/25/2015 ECN 2015-5886				OJM																																
<h3 style="margin: 0;">STT750/850 Series Temperature Transmitter</h3> <h3 style="margin: 0;">ANALOG, HART/DE and FF/ PA Communications</h3>																																					
<ol style="list-style-type: none"> 1. Intrinsically safe installation shall be in accordance with <ol style="list-style-type: none"> a. FM (USA): ANSI/NFPA 70, NEC[®] Articles 504 and 505. b. CSA (Canada): Canadian Electrical Code (CEC), part I, section 18. c. ATEX: Requirements of EN 60079-14, 12.3 (See also 5.2.4). d. IECEx: Requirements of IEC 60079-14, 12.3 (See also 5.2.4). 2. ENTITY approved equipment shall be installed in accordance with the manufacturer's Intrinsic Safety Control Drawing. 3. The Intrinsic Safety ENTITY concept allows the interconnection of two ENTITY Approved Intrinsically safe devices with ENTITY parameters not specifically examined in combination as a system when: <p style="margin-left: 20px; font-size: x-small;"> $U_o, V_{oc}, \text{ or } V_t \leq U_i \text{ or } V_{max}; I_o, I_{sc}, \text{ or } I_t \leq I_i \text{ or } I_{max}; C_a \text{ or } C_o \geq C_i + C_{cable}, L_a \text{ or } L_o \geq L_i + L_{cable}, P_o \leq P_i.$ </p> <p style="margin-left: 20px; font-size: x-small;">Where two separate barrier channels are required, one dual-channel or two single-channel barriers may be used, where in either case, both channels have been Certified for use together with combined entity parameters that meet the above equations.</p> 4. System Entity Parameters: <p style="margin-left: 20px; font-size: x-small;">STT750/ STT850 Transmitter: $V_{max} V_{oc} \text{ or } U_o, I_{max} I_{sc} \text{ or } I_o;$</p> <p style="margin-left: 20px; font-size: x-small;">STT750/ STT850 Transmitter: $C_i + C_{cable} \leq \text{Control Apparatus } C_a,$</p> <p style="margin-left: 20px; font-size: x-small;">STT750/ STT850 Transmitter: $L_i + L_{cable} \leq \text{Control Apparatus } L_a.$</p> 5. When the electrical parameters of the cable are unknown, the following values may be used: <p style="margin-left: 20px; font-size: x-small;">Capacitance: 197pF/m (60 pF/ft)</p> <p style="margin-left: 20px; font-size: x-small;">Inductance: 0.66µH/m (0.020µH/ft).</p> 6. Control equipment that is connected to Associated Equipment must not use or generate more than 250 V. 7. Associated equipment must be FM, CSA ATEX or IECEx (depending on location) listed. Associated equipment may be installed in a Class I, Division 2 or Zone 2 Hazardous (Classified) location if so approved. 8. Non-Galvanically isolated equipment (grounded Zener Barriers) must be connected to a suitable ground electrode per: <ol style="list-style-type: none"> a. FM (USA): NFPA 70, Article 504 and 505. The resistance of the ground path must be less than 1.0 ohm. b. CSA (Canada): Canadian Electrical Code (CEC), part I, section 10. c. ATEX: Requirements of EN 60079-14, 12.2.4. d. IECEx: Requirements of IEC 60079-14, 12.2.4. 9. Intrinsically Safe DIVISION 1/ Zone 0 WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR USE IN HAZARDOUS LOCATIONS. 10. Division 2/ Zone 2: WARNING: DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT. 11. NO REVISION OF THIS CONTROL DRAWING IS PERMITTED WITHOUT AUTHORIZATION FROM THE AGENCIES listed. 12. For release approvals see ECO-0110873. 																																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">DRAWN</td> <td style="width: 15%;">OJM</td> <td style="width: 15%;">03/28/14</td> </tr> <tr> <td>CHECKED</td> <td></td> <td></td> </tr> <tr> <td>DEV ENG</td> <td></td> <td></td> </tr> <tr> <td>MFG ENG</td> <td></td> <td></td> </tr> <tr> <td>QA ENG</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="text-align: center; font-size: x-small;">TOLERANCE UNLESS NOTED</td> </tr> <tr> <td colspan="3" style="text-align: center; font-size: x-small;">ANGULAR DIMENSION</td> </tr> </table>	DRAWN	OJM	03/28/14	CHECKED			DEV ENG			MFG ENG			QA ENG			TOLERANCE UNLESS NOTED			ANGULAR DIMENSION			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="font-size: large; font-weight: bold;">Honeywell</td> </tr> <tr> <td colspan="2" style="font-weight: bold;">CONTROL DRAWING</td> </tr> <tr> <td colspan="2" style="font-weight: bold;">STT750/STT850 SERIES TEMPERATURE</td> </tr> <tr> <td colspan="2" style="font-weight: bold;">TRANSMITTER</td> </tr> <tr> <td colspan="2" style="font-weight: bold;">DIVISIONS 1 & 2 / ZONE 0 & 2</td> </tr> <tr> <td style="width: 15%; text-align: center; font-size: large; font-weight: bold;">A/ A4</td> <td style="width: 85%; text-align: center; font-size: large; font-weight: bold;">50091227</td> </tr> <tr> <td style="width: 30%; font-size: x-small;">SCALE: None</td> <td style="width: 35%; font-size: x-small;">USED ON</td> <td style="width: 35%; font-size: x-small;">SH. 1 OF 6</td> </tr> </table>	Honeywell		CONTROL DRAWING		STT750/STT850 SERIES TEMPERATURE		TRANSMITTER		DIVISIONS 1 & 2 / ZONE 0 & 2		A/ A4	50091227	SCALE: None	USED ON	SH. 1 OF 6
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INSTRUCTIONS FOR INMETRO

1. Instalação de segurança intrínseca devem estar de acordo com Requisitos de IEC 60079-14, 12.3 (See also 5.2.4).
2. ENTIDADE equipamento aprovado deve ser instalado de acordo com a segurança intrínseca Desenho de Controle do fabricante.
3. O conceito de Segurança Intrínseca ENTIDADE permite a interligação de dois entidade credenciada dispositivos de segurança intrínseca com parâmetros de entidade não examinados especificamente em combinação como um sistema quando:

$U_o, V_{oc}, \text{ or } V_t \leq U_i \text{ or } V_{max}; I_o, I_{sc}, \text{ or } I_t \leq I_i \text{ or } I_{max}; C_a \text{ or } C_o \geq C_i + C_{cable}, L_a \text{ or } L_o \geq L_i + L_{cable}, P_o \leq P_i.$
 Quando forem necessários dois canais separados de barreira, um dual-channel ou duas barreiras de canal único pode ser usado, onde em ambos os casos, ambos os canais foram certificados para uso em conjunto com os parâmetros entidade combinada que atendam as equações acima.
4. Parâmetros da Entidade de sistema::

$V_{max} V_{oc} \text{ or } U_o, I_{max} I_{sc} \text{ or } I_o;$
 $C_i + C_{cable} \leq \text{Control Apparatus } C_a,$
 $L_i + L_{cable} \leq \text{Control Apparatus } L_a.$
5. Quando os parâmetros eléctricos do cabo não são conhecidos, podem ser utilizados os seguintes valores::

Capacidade: 197pF/m (60 pF/ft)
 Indutância: 0.66µH/m (0.020µH/ft).
6. Os equipamentos de controle que está ligado à Associated Equipment não deve usar ou gerar mais de 250 V.
7. Equipamentos associados devem ser IECEx (dependendo da localização) listados. Equipamentos associados podem ser instalados em uma perigosos (classificados) local Classe I, Divisão 2 ou Zona 2 se for aprovado.
8. O equipamento não Galvanicamente isolado (Barreiras Zener aterradas) deve ser conectado a um eletrodo de aterramento adequado por IECEx: Requisitos de IEC 60079-14, 12.2.4.
9. Intrinsecamente seguro Divisão 1 / Zona 0 AVISO: substituição de componentes pode prejudicar a adequação para uso em locais perigosos.
10. Divisão 2 / Zona 2: AVISO: NÃO aberto quando uma atmosfera de gás explosiva.
11. Nenhuma revisão deste desenho CONTROL é permitida sem autorização dos órgãos listados.
12. Para aprovações de libertação ver ECO # 0094464.

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SCALE: None		REV D DATE 11-25-2015	SH. 2 of 6

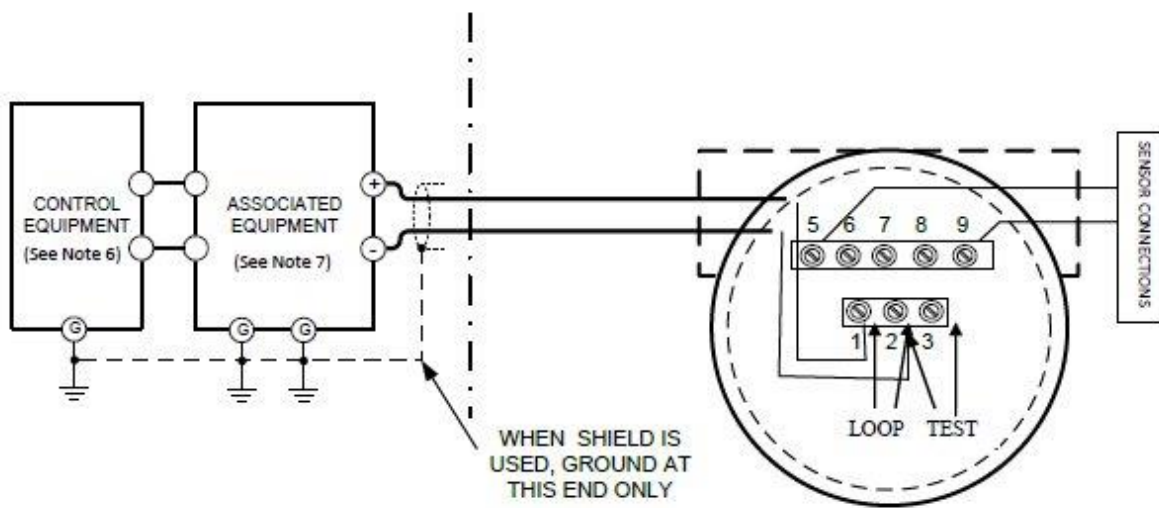
HART/DE

TERMINAL	ENTITY PARAMETERS	ASSOCIATED APPARATUS
1,2 (LOOP)	U_i or $V_{max} \leq 30V$	U_o, V_{oc} or $V_t \leq 30V$
	i_i or $I_{max} \leq 225\text{ mA}$	I_o (I_{sc} or I_t) $\leq 225\text{ mA}$
	P_i or $P_{max} = 0.9W$	$P_o \leq 0.9W$
	$C_i = 4\text{ nF}$	C_a or $C_o \geq C_{cable} + C_{STT750/STT850}$
	$L_i = 0\text{ }\mu\text{H}$	L_a or $L_o \geq L_{cable} + L_{STT750/STT850}$
5, 6, 7, 8, 9 (SENSOR- SEE Page 5)	$C_o = 39\text{ }\mu\text{F}$	----
	$L_o = 4.99\text{ H}$	----

NON-HAZARDOUS LOCATION

HAZARDOUS (CLASSIFIED) LOCATION

CLASS I, DIVISION 1, GROUPS A, B, C, D, E, F & G;
 ZONE 0 IIC & ZONE 2 IIC,
 CLASS I DIVISION 2, GROUPS A, B, C, D;



FOR DIV 2 / ZONE 2 INSTALLATIONS

CONTROL EQUIPMENT PARAMETERS
 $U_{max} = U_i = 42V, 4-20\text{ mA}, P_o \leq 1\text{ W}$
 NOTE : ASSOCIATED EQUIPMENT NOT REQUIRED

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SCALE: None

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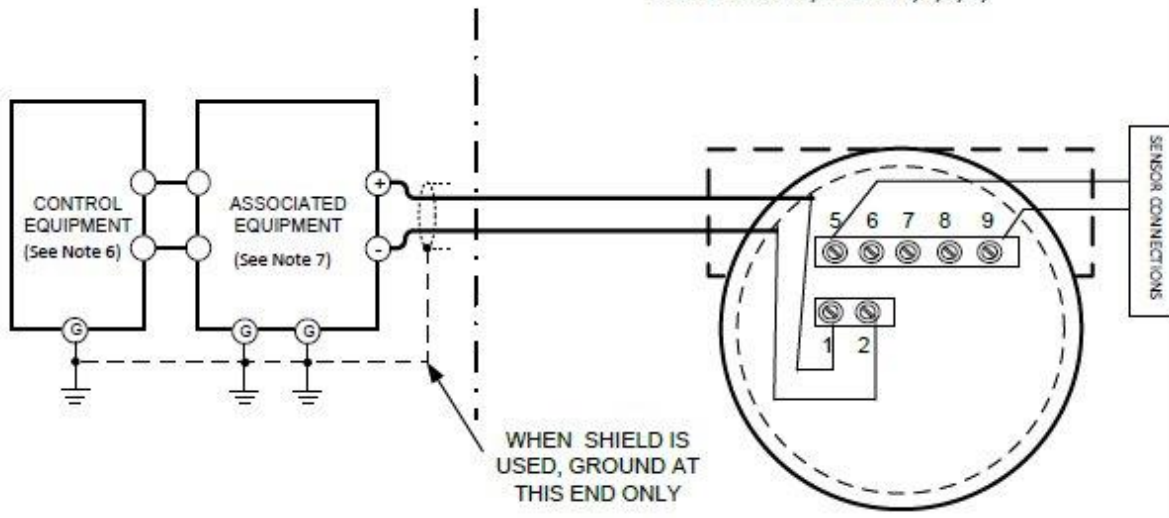
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**FOUNDATION FIELDBUS/ PROFIBUS
(OPTION ONLY AVAILABLE ON THE STT850)**

TERMINALS	NON FISCO		FISCO	
	ENTITY PARAMETERS	Associated Apparatus	ENTITY PARAMETERS	Associated Apparatus
1,2 (FF CONNECTION)	U_i or $V_{max} \leq 30V$	U_o, V_{oc} or $V_t \leq 30V$	U_i or $V_{max} \leq 17.5$	U_o, V_{oc} or $V_t \leq 18V$
	i_i or $I_{max} < 225$ mA	I_o (I_{sc} or I_t) ≤ 225 mA	i_i or $I_{max} \leq 380$ mA	I_o (I_{sc} or I_t) ≤ 380 mA
	P_i or $P_{max} = 1W$	$P_o \leq 1$ W	P_i or $P_{max} = 5.32W$	$P_o \leq 5.32$ W
	$C_i = 0$ nF	C_a or $C_o \geq C_{cable} + C_{STT850}$	$C_i = 0$ nF	C_a or $C_o \geq C_{cable} + C_{STT850}$
	$L_i = 0$ μ H	L_a or $L_o \geq L_{cable} + L_{STT850}$	$L_i = 0$ μ H	L_a or $L_o \geq L_{cable} + L_{STT850}$
5, 6, 7, 8, 9 (SENSOR- SEE PAGE 5)	$C_o = 39$ μ F	----	$C_o = 39$ μ F	----
	$L_o = 4.99$ H	----	$L_o = 4.99$ H	----

NON-HAZARDOUS LOCATION

HAZARDOUS (CLASSIFIED) LOCATION
 CLASS I, CLASS II, DIVISION 1, GROUPS A, B, C, D, E, F & G;
 ZONE 0 IIC & ZONE 2 IIC,
 CLASS I DIVISION 2, GROUPS A, B, C, D;



DIV 2 / ZONE 2 INSTALLATIONS

CONTROL EQUIPMENT PARAMETERS

$U_{max} = U_i = 32V, 25$ mA, $P_o \leq 1$ W

NOTE : ASSOCIATED EQUIPMENT NOT REQUIRED

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SCALE: None

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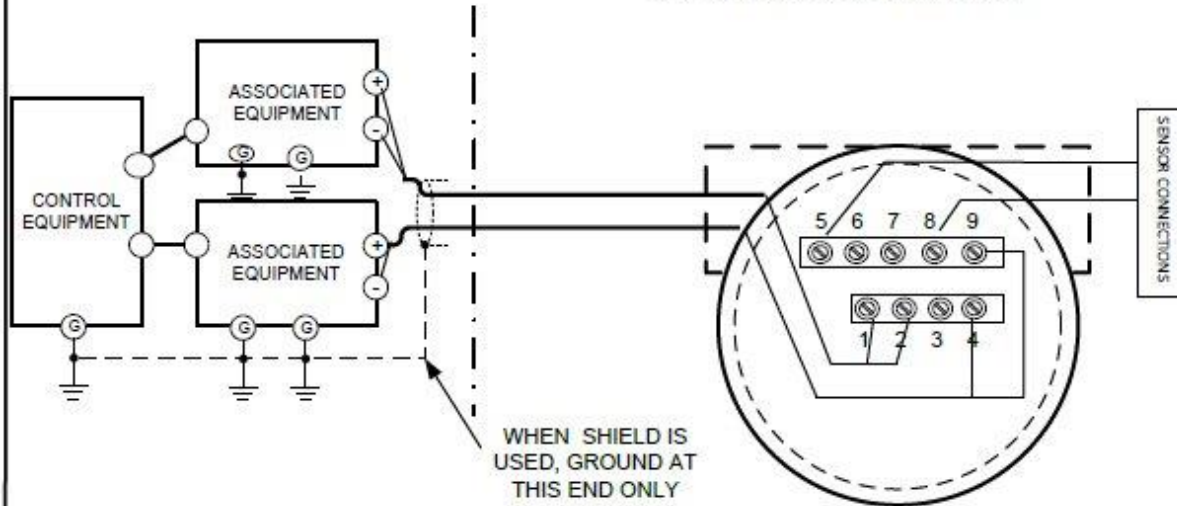
SH. 4 of 6

HART/DE WITH DIGITAL OUTPUT OPTION

TERMINAL	ENTITY	Associated Apparatus
1,2 (LOOP)	U_i or $V_{max} \leq 30V$	U_o, V_{oc} or $V_t \leq 30V$
	i_i or $I_{max} \leq 225\text{ mA}$	I_o (I_{sc} or I_t) $\leq 225\text{ mA}$
	P_i or $P_{max} = 0.9W$	$P_o \leq 0.9\text{ W}$
	$C_i = 4\text{ nF}$	C_a or $C_o \geq C_{cable} + C_{STT850}$
	$L_i = 0\text{ }\mu H$	L_a or $L_o \geq L_{cable} + L_{STT850}$
4, 9 (DO OPTION)	U_i or $V_{max} \leq 27V$	U_o, V_{oc} or $V_t \leq 27V$
	i_i or $I_{max} < 30\text{ mA}$	I_o (I_{sc} or I_t) $\leq 30\text{ mA}$
	P_i or $P_{max} = 0.5W$	$P_o \leq 0.5\text{ W}$
	$C_i = 85\text{ nF}$	C_a or $C_o \geq C_{cable} + C_{STT850,DO}$
	$L_i = 24\text{ }\mu H$	L_a or $L_o \geq L_{cable} + L_{STT850,DO}$
5,6,7,8 (SENSOR- SEE Page 6)	$C_o = 39\text{ }\mu F$	---
	$L_o = 4.99\text{ H}$	---

NON-HAZARDOUS LOCATION

HAZARDOUS (CLASSIFIED) LOCATION
 CLASS I, DIVISION 1, GROUPS A, B, C, D, E, F & G;
 ZONE 0 IIC & ZONE 2 IIC,
 CLASS I DIVISION 2, GROUPS A, B, C, D;



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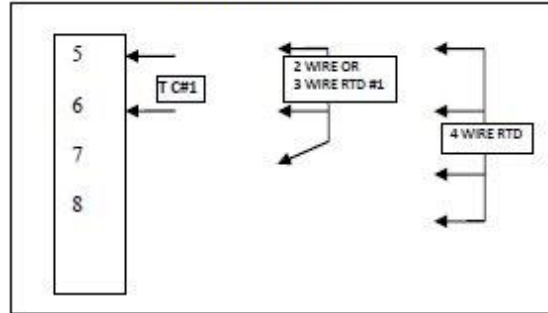
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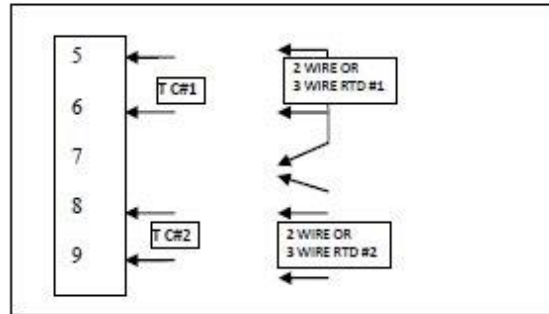
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SENSOR CONNECTIONS

Single Input



Dual Input



Note:

1. DUAL INPUT OPTION IS ONLY AVAILABLE WITH HART/ DE COMMUNICATIONS ON THE STT850.

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SCALE: None

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DATE 11-25-2015

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Glossary

AWG	American Wire Gauge
CVD	Callendar Van Duesen is an equation that describe the relationship between resistance (R) and temperature (t) of platinum resistance thermometers (RTD)
DE	Digital Enhanced Communications Mode
EMI	Electromagnetic Interference
FF	Foundation Fieldbus
FTA	Field Termination Assembly
Hz	Hertz
LRL	Lower Range Limit
LRV	Lower Range Value
mAdc	Milliamperes Direct Current
mV	Millivolts
Nm	Newton-meters
NVM	Non-Volatile Memory
PM	Process Manager
PV	Process Variable
PWA	Printed Wiring Assembly
RFI	Radio Frequency Interference
RTD	Resistance Temperature Detector
T/C	Thermocouple
URL	Upper Range Limit
URV	Upper Range Value
US	Universal Station
Vac	Volts Alternating Current
Vdc	Volts Direct Current

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Sales and Service

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

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