

SmartLine Temperature Probe Assemblies Specifications

Model: STT85A

34-TT-03-21, June 2023



Introduction

Honeywell SmartLine Temperature probe assemblies are a perfect complement to SmartLine Temperature transmitters to provide factory tested, calibrated, and certified assembly for accurate, reliable, and safe measurement in process applications. STT85A is an integrated probe assembly based on SmartLine Temperature transmitter STT850, caters to tough industrial applications and includes variety of temperature elements, thermowells, and extension types.

Choose the unit to meet your application needs:

- Rigid probe assembly without thermowell (Figure 1)
- Threaded and socket weld assembly with thermowell and extension (Figure 2)
- Drilled Flanged assembly with thermowell and extension (Figure 3)
- RTD and Thermocouple options available for all variants.

Leading Performance

- Class A accuracy for RTDs as standard
- Class 1 accuracy for thermocouples as standard
- Option of direct entry of Callender-Van Dusen coefficients for increased RTD accuracy.
- Wired to Best in class Honeywell SmartLine transmitter STT850
- SIL2/3 capable transmitter



Figure 1: Transmitter with Rigid Probe

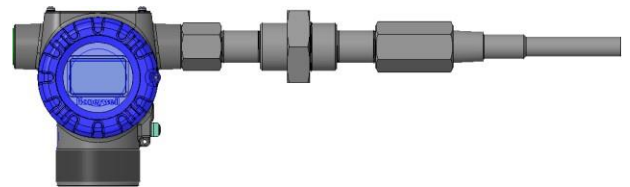


Figure 2: Transmitter with Threaded Thermowell

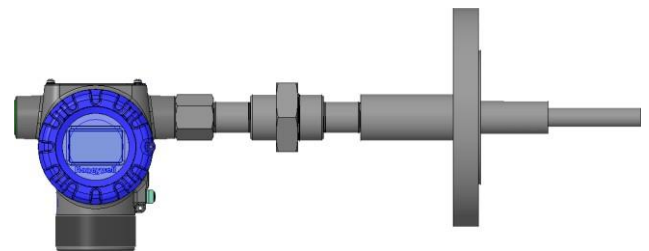


Figure 3: Transmitter with Flanged Thermowell

Features

- Out of box, ready to install temperature point resulting in lower engineering, procurement, installation, and commissioning cost
- Factory calibrated transmitter with probe assembly
- Agency approved integrated temperature probe assembly, approved for HAZLOC installations
- Communication protocol options - analog, HART, DE, FF
- Integrated assembly testing and certification.
- Tapered and Straight thermowell designs
- Duplex sensor for Differential/ Averaging/ Redundant measurements.
- Sensor break detection
- Optional multipoint calibration with certificate
- Best in class accuracy over wide temperature range

RTD Tolerance Class and Temperature Ranges		
Tolerance Class	Measurement range	Tolerance values
Class A	-180 to 500 °C	$\pm (0.15 + 0.002 t)^\circ\text{C}$
Class B	-180 to 650 °C	$\pm (0.3 + 0.005 t)^\circ\text{C}$

Model Selection Guide code key

Refer to [Model Selection Guide](#)

Standard Temperature (MSG code R)

Standard temperature is recommended for uses up to -50 to +260 °C

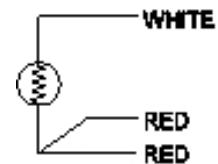
The Standard RTD is a ceramic wire-wound resistor. It provides high accuracy along the entire temperature range.

High Temperature (MSG code H)

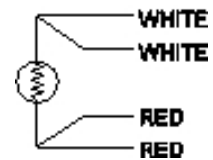
Extended temperature is recommended for uses up to -180 to 500 °C

It is made utilizing MgO insulated, metal sheathed cable. Internal lead wires are made from nickel-plated copper wires. This provides the minimum lead wire resistance change with temperature. H type RTD's employ a Ceramic wire wound element ensuring high accuracy across extended temperature measurement range.

- **PT100, 3-wire (MSG option R2 or H2)**
 - Construction: Single, 3-wire
 - Resistance @ 0°C: 100 OHMS
 - Temperature Coefficient of Resistance: .00385
 - Sheath Material: 316 Stainless Steel
 - Sheath Diameter: ¼"

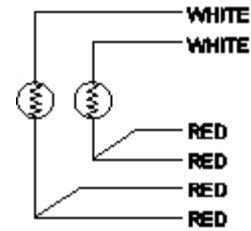


- **PT100, 4-wire (MSG option R3 or H3)**
 - Construction: Single, 4-wire
 - Resistance @ 0°C: 100 OHMS
 - Temperature Coefficient of Resistance: .00385
 - Sheath Material: 316 Stainless Steel
 - Sheath Diameter: ¼"



• **PT100 Duplex, 3-wire (MSG option R4 or H4)**

- Construction: Duplex, 3-wire
- Resistance @ 0°C: 100 OHMS
- Temperature Coefficient of Resistance: .00385
- Sheath Material: 316 Stainless Steel
- Sheath Diameter: ¼"



Lead Wire provides for termination from the sheath solid wire to flexible lead wire with Teflon insulation. Lead wires are attached by soldering and the area is sealed with epoxy to provide a durable moisture seal. Lead wires terminate to bare ends for connection to terminal block or transmitters.

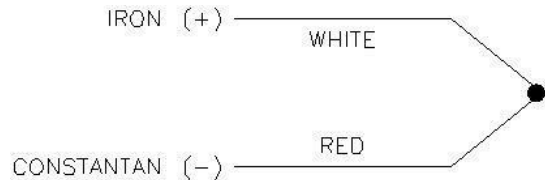
Thermocouples

SmartLine Temperature probe assemblies offer Class 1 sensor accuracy as standard and Class 2 sensor accuracy for higher temperature ranges.

Tolerance Class	Thermocouple Types and Temperature Ranges		Tolerance values
	Type J	Type K	
Class 1	0 to 760 °C	0 to 1260 °C	+/-1.1 °C or 0.4% of measured value, whichever is greater
Class 2	0 to 760 °C	-	+/-2.2 °C or 0.75% of measured value, whichever is greater
Class 2	-	0 to 1260 °C	+/-2.2 °C or 0.75% of measured value, whichever is greater

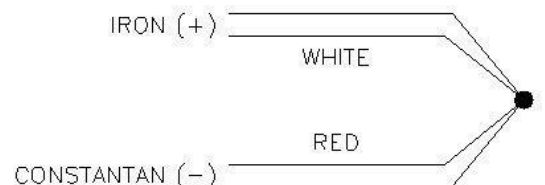
• **Type J (MSG option T1)**

- Construction: Single
- Calibration: Type J, Iron - Constantan
- Conductor Size: 18 Ga.
- Insulation: Hard Packed MgO
- Sheath Material: 316 Stainless Steel
- Sheath Diameter: ¼" (6mm)
- Temperature Range: 32 to +1400° F (0 to 760 °C)



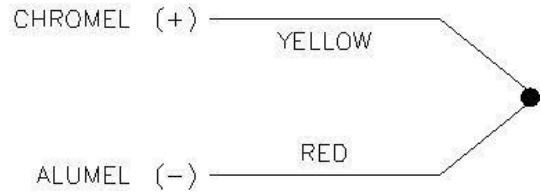
• **Type J, Duplex (MSG option T2)**

- Construction : Duplex
- Calibration : Type J, Iron – Constantan
- Conductor Size: 18 Ga.
- Insulation: Hard Packed MgO
- Sheath Material: 316 Stainless Steel
- Sheath Diameter: ¼" (6mm)
- Temperature Range: 32 to +1400° F (0 to 760 °C)



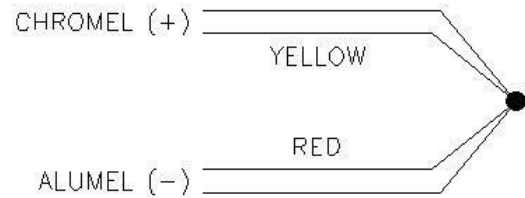
- **Type K (MSG option T3)**

- Construction: Single
- Calibration: Type K, Chromel – Alumel
- Conductor Size: 18 Ga.
- Insulation: Hard Packed MgO
- Sheath Material: 316 Stainless Steel
- Sheath Diameter: ¼" (6mm)
- Temperature Range: -328 to +2300° F (-200 to 1260 °C)



- **Type K, Duplex (MSG option T4)**

- Construction: Duplex
- Calibration: Type K, Chromel – Alumel
- Conductor Size: 18 Ga.
- Insulation: Hard Packed MgO
- Sheath Material: 316 Stainless Steel
- Sheath Diameter: ¼" (6mm)
- Temperature Range: -328 to +2300° F (-200 to 1260 °C)



Type J: Iron (+) vs Constantan (-), is the most commonly used Thermocouple. It is suitable for use in a vacuum, inert, oxidizing (with the iron leg protected) or reducing atmosphere. If unprotected the iron wire may be attacked by ammonia, nitrogen and hydrogen atmospheres. In sub-zero temperatures, the iron wire may rust or become brittle. Type J should not be used in sulfurous atmospheres above 540°C.

Type K: Chromel (+) vs Alumel (-) is generally used to measure high temperatures up to 2300°F. It should not be used for accurate temperature measurement below 900°F or after prolonged exposure above 1400°F. If unprotected, it can be used only in inert or oxidizing atmospheres. It has a short life in alternately oxidizing and reducing atmospheres and in reducing atmospheres, particularly in the 1500 to 1850°F range.

Grounded Measuring Junction – G

(Not permitted with ATEX and IECEx Intrinsically Safe certification)

In this construction, the measuring junction is completely sealed from contaminants and becomes an integral part of sheath at the tip of the thermocouple. Response time approaches that of an exposed loop thermocouple and in addition, the junction conductors are completely protected in a pressure tight seal protecting it from harsh environmental conditions and mechanical damage. Grounded junctions should not be used when ground loops or other electrical interference is likely.

Dual grounded junction thermocouples furnish two measuring circuits for simultaneous control and indication (or recording) of a single point with two instruments. This prevents the signal loading effect common to instrumentation of low or combination low and high impedance.



Ungrounded Measuring Junction - U

In this construction, the thermocouple conductors are welded together to form the junction, which is insulated from the external sheath with magnesium oxide. The response time for an insulated junction is slightly longer than for a grounded junction thermocouple of the same outside diameter. This feature is advantageous in applications where thermocouples are used in conductive solutions, or when used for differential, averaging (parallel) or additive (series) applications, or wherever isolation of the measuring circuitry is required. The strain due to differential expansion between wires and sheath may reduce.



Same as the single ungrounded junction the dual ungrounded junction thermocouples furnish two measuring circuits for simultaneous control and indication (or recording) of a single point with two instruments. This prevents the signal loading effect which is common to instrumentation of low or combination low and high impedance.

Lead Wire provides for termination from the sheath solid wire to flexible lead wire with PVC insulation. Lead wires are attached by welding or soldering and the area is then sealed with epoxy to provide a durable moisture seal. Thermocouple lead wires utilize the same alloys as the thermocouple calibration. Lead wires terminate to bare ends for connection to terminal block or transmitters.

Extension

To complete the connection between the thermowell and the transmitter a nipple or nipple / union / nipple combination is used.

The most economical would be a pipe nipple. A nipple / union / nipple combination allows for rotating the connection head 360°. Hex nipples provide for wrench adjustment. Extensions are available mainly in stainless steel for corrosion protection. Standard Extension lengths ('A') are 1, 2 or 5" with options of " longer lengths available as specials to extend the head beyond insulation or firebrick.

Extension Specifications:

Straight Nipple Extension Only (MSG option N03S or N06S)

- Most economical
- Provides for minimal space between head and thermowell
- Nipple size: $\frac{1}{2}$ " NPT
- Available materials: 316 Grade Stainless Steel
- Standard "A" Length: 2" and 5"

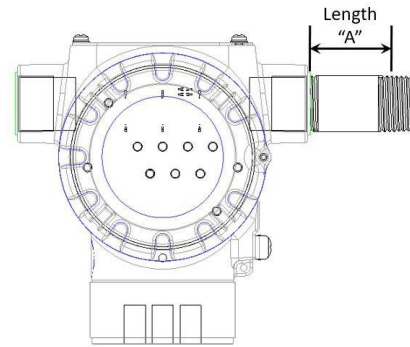


Figure 4: Nipple Extension Only

Hex Nipple Extension (MSG option H02S)

- Machined from solid bar stock
- Best suited for wiring the transmitter
- Hex allows for easy dis-assembly
- Standard "A" length of 1"
- Standard 316 Grade Stainless Steel

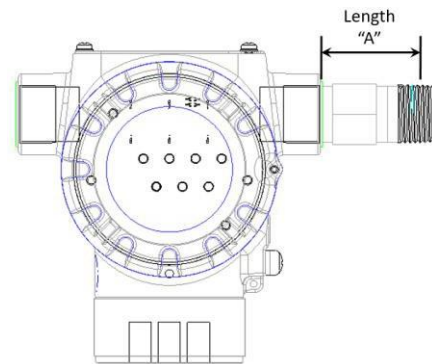


Figure 5: Hex Nipple Extension

Nipple/Union/Nipple Extension (MSG option U06C or U06S)

- Union provides the means for positioning for conduit cable connection
- Nipple size: $\frac{1}{2}$ " NPT
- Union size: $\frac{1}{2}$ " NPT, Pressure Class 150
- Available nipple materials: Carbon Steel or 316 Grade Stainless Steel
- Available union materials: Carbon Steel or 316 Grade Stainless Steel
- Standard "A" Length: 5", Available in other lengths.

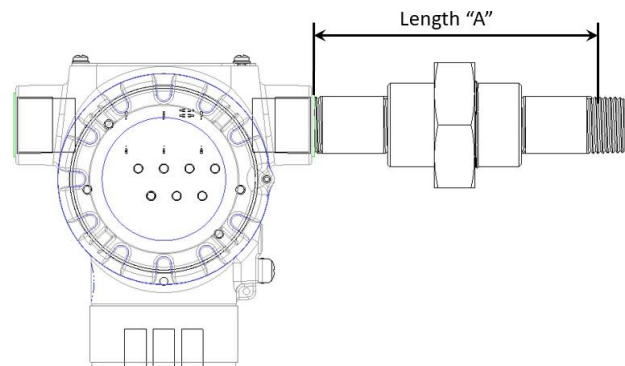


Figure 6: Nipple/Union/Nipple Extension

Hex Nipple/Union/Nipple Extension (MSG option H06S)

- Union provides the means for positioning for conduit cable connection
- Best suited for wiring the transmitter
- Hex nipple provides for additional wrench tightening
- Union provides the means for positioning for conduit cable connection
- Nipple size: ½" NPT
- Union size: ½" NPT, Pressure Class 150
- Hex nipple: 316 Grade Stainless Steel
- Standard "A" Length: 5".
Available in other lengths,

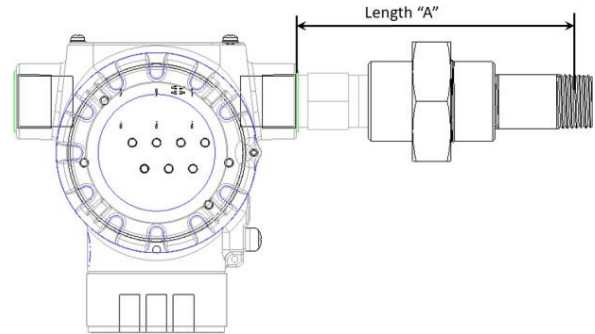


Figure 7: Hex Nipple/Union/Nipple Extension

Nipple/Explosion Proof Union/Nipple Extension (MSG option E06S)

Same benefits as the standard Nipple/Union/Nipple extension except with explosion proof union rated:

- Ex Union: ½" NPT, Pressure Class 3000
- Recommended when supplied with explosion proof connection heads.

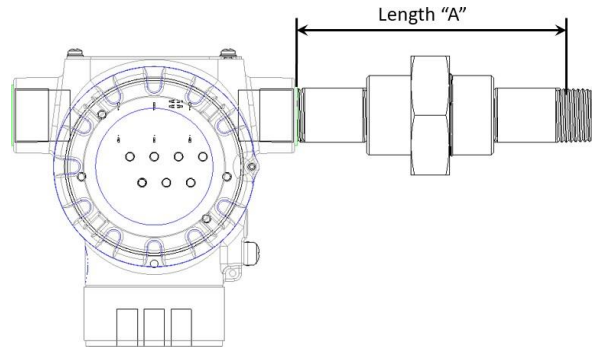


Figure 8: Nipple/Explosion Proof Union/Nipple Extension

Hex Nipple/Explosion Proof Union/Nipple Extension (MSG option X06S)

Same benefits as the standard Hex Nipple/Union/Nipple extension except with explosion proof union rated:

- Ex Union: ½" NPT, Pressure Class 3000
- Recommended when supplied with explosion proof connection heads.

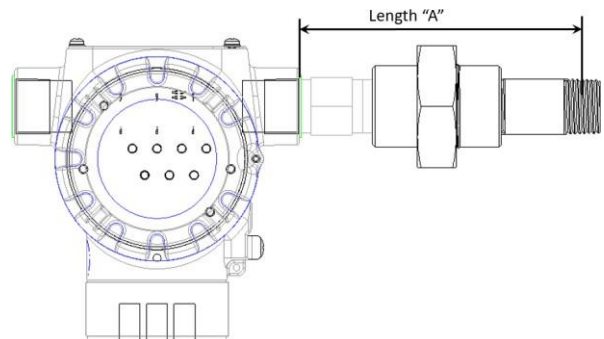


Figure 9: Hex Nipple/Explosion Proof Union/Nipple Extension

Thermowells:

Thermowells are generally incorporated into the process three ways, threaded, welded or a flanged connection. For smaller diameters where the well is not required to be removed on a regular basis and corrosion is not a serious problem, threaded process connections are preferred. By threading into a coupling, thread-o-let or TEE, the well has attached directly to the vessel or run pipe.

For installations where the well needs to be removed more frequently due to corrosion or other requirements, a flange connection is used. The flange connection will bolt to a mating flange mounted to the process. Flange connections are more appropriate for high-pressure applications and larger pipe sizes.

For applications where access is not required, a socket well can be used; these provide high quality connection and cannot be removed without significant effort. Welded connections are also preferred for high pressure, high temperature steam lines.

Threaded and Socket thermowells

- 1/2" NPT & 1/2" BSP Process Connection)
- 3/4" NPT & 3/4" BSP Process Connection)
- 3/4" NPS Socketweld Process Connection
- Thermowell material: SS316/SS316L Dual certified

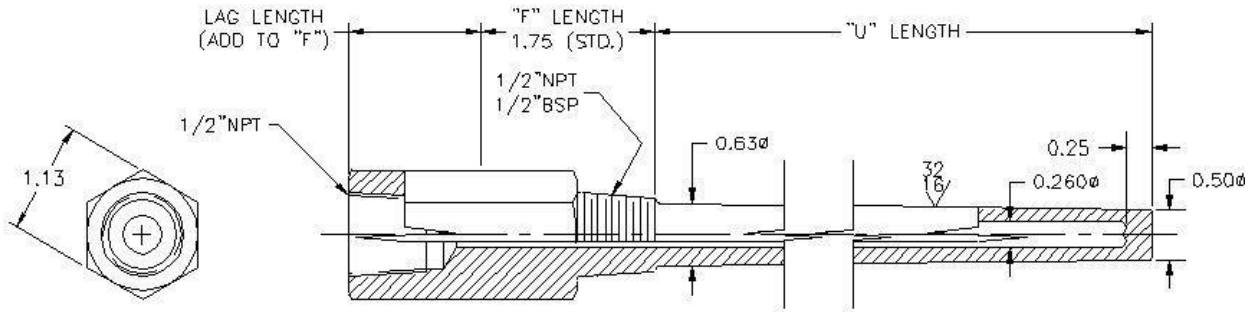


Figure 10: T Tapered Design (1/2" NPT & 1/2" BSP)

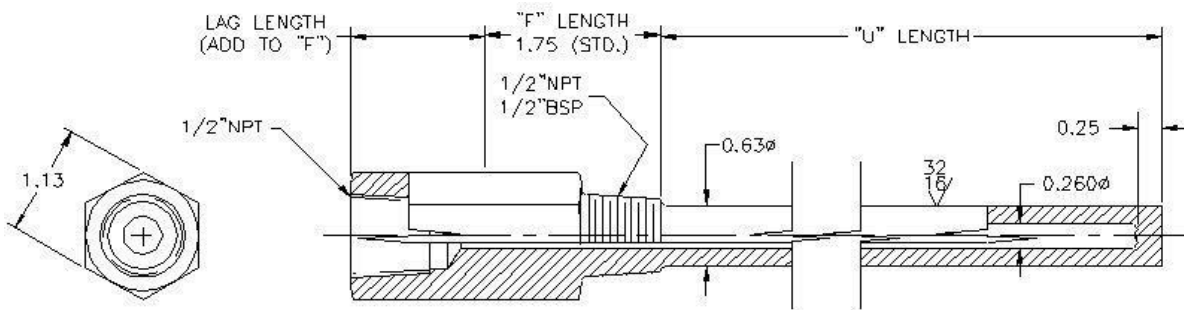


Figure 11: S Straight Design (1/2" NPT & 1/2" BSP)

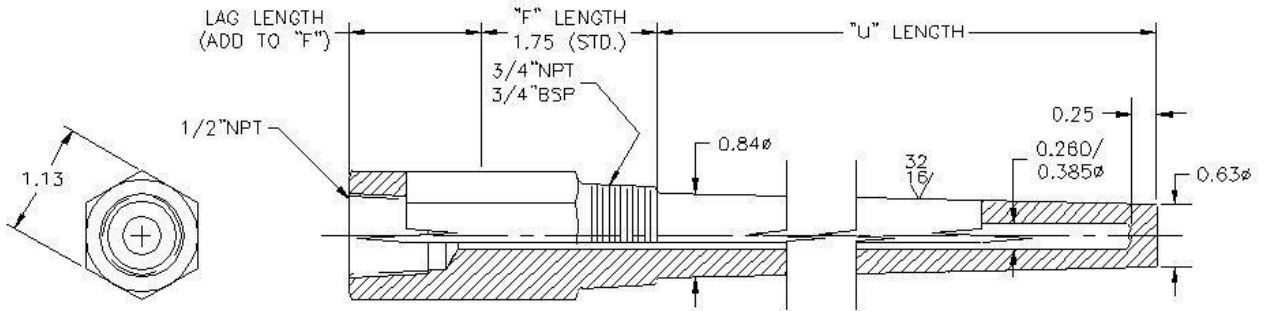


Figure 12: T Tapered Design (3/4" NPT & 3/4" BSP)

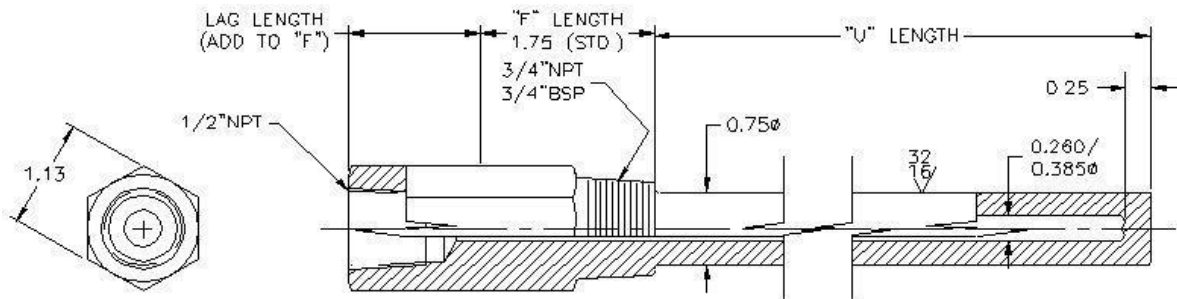


Figure 13: S Straight Design (3/4" NPT & 3/4" BSP)

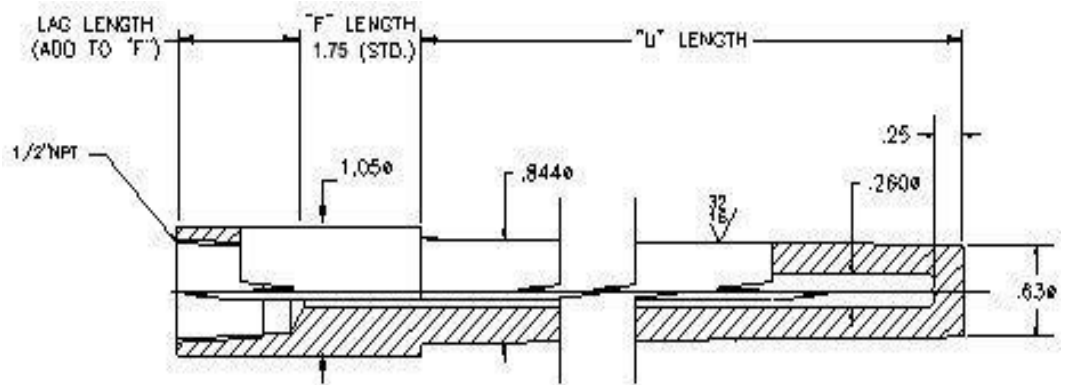


Figure 14: Selection M (3/4" NPS Socket Weld Process Connection)

Flanged Thermowells:

- Flange sizes: 1", 1.5" & 2"; Others on request
- Flange Face: Raised Flange(RF) as standard & Ring Type Joint(RTJ) on request
- Flange Ratings: 150lbs, 300lbs, 600lbs, 900lbs, 1500lbs & 2500lbs
- Flange & Thermowell Material: SS316/SS316L Dual certified

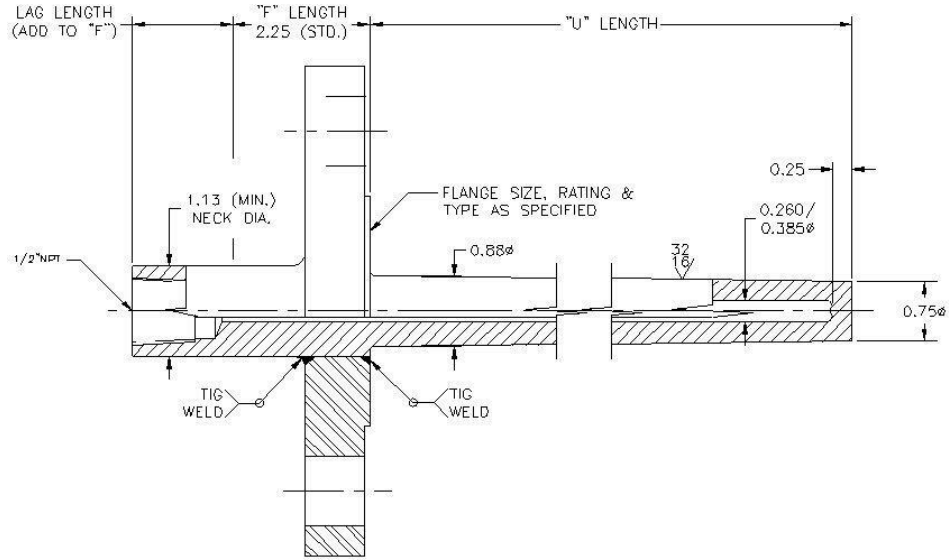


Figure 15: Tapered Design, 0.260Ø Bore

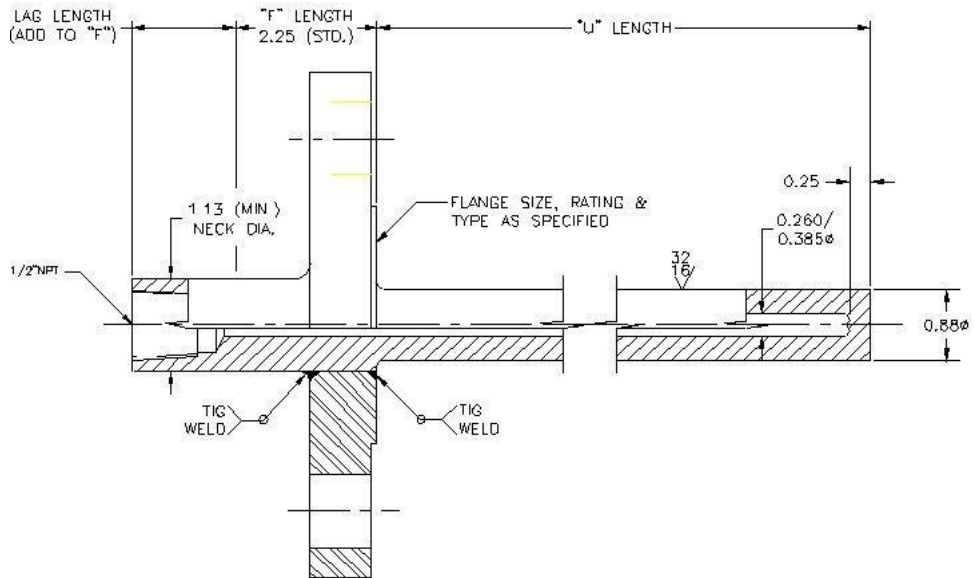


Figure 16: Straight Design, 0.260Ø Bore

Transmitter & Housing details:**Transmitter Model: STT850**

- Digital accuracy upto +/-0.10 Deg C for RTD
- Stability upto +/- 0.01% of URL per year for ten years
- External Zero, span and configuration capability
- Digital output option (Available with HART)
- Multiple local display capabilities
- Dual compartment housing
- Direct entry of Callandar-Van Dusen(CVD) coefficients for RTD sensors
- Full compliance to SIL2/SIL3 requirements
- High galvanic isolation
- Protection grade: **IP66/67 (NEMA 4X)**
- Max. ambient temperature: **85° C (185°F)**
- Material: **Low copper Aluminum / 316 Stainless Steel**
- Conduit Entry: **½” NPT / M20**
- Thermowell Entry: **½” NPT / M20**
- Aluminum Body Finish: **Pure Polyester Powder Coated**



Figure 17:
STT850 Temperature Transmitter

Refer STT850 specifications for more details, 34-TT-03-14,

<https://www.honeywellprocess.com/library/marketing/tech-specs/34-TT-03-14.pdf>

Refer STT850 latest documents at: <https://www.honeywellprocess.com/smartline-stt850.aspx>

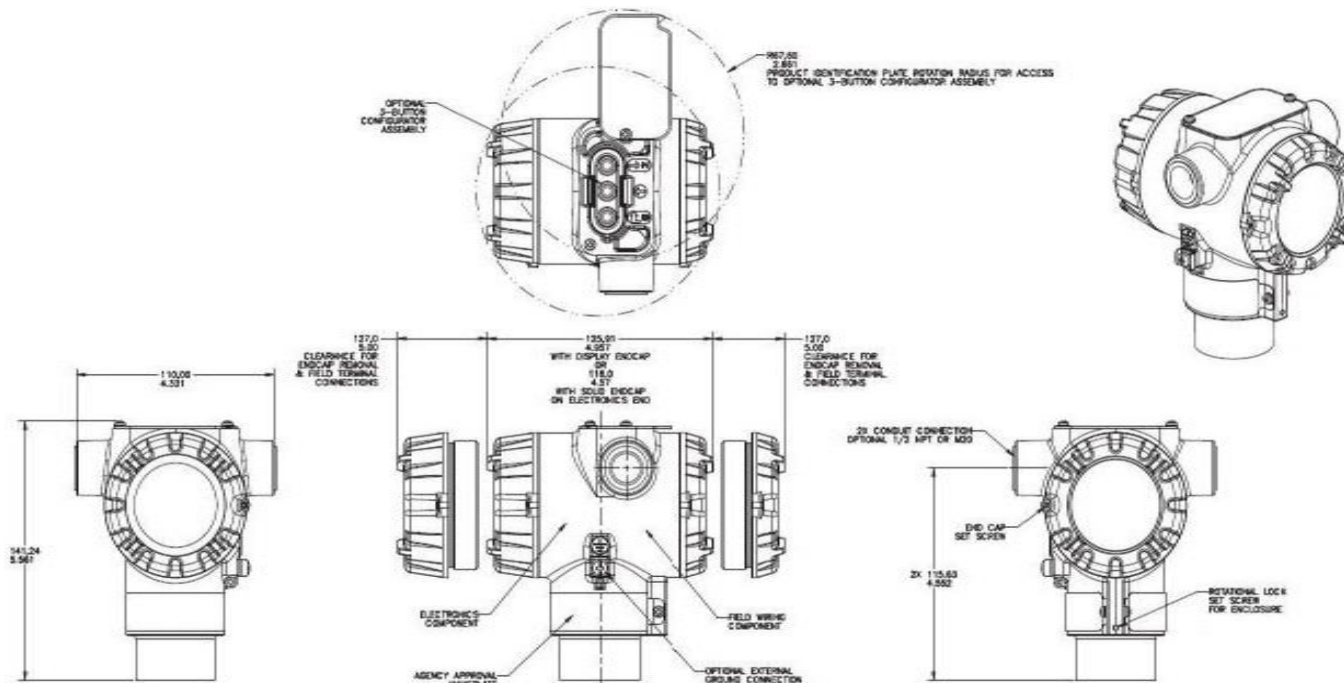


Figure 18: STT850 Temperature Transmitter Dimensions

Integrated or Remote Displays

SmartLine Temperature Probe Assembly STT85A can be supplied with local or remote indication as an option. A Basic Display or an Advanced Display can be mounted integral to the transmitter inside the field mount housing and can be ordered as part of the model number or order a remote meter as model RMA801 or RMA803 depending on the type of the protocol. See <https://www.honeywellprocess.com/remote-meter-assemblies.aspx>

Assembly Options

Selection AP1, AP2, AP3 & AP5 Probe Calibration Data Certificate

Probe calibration provided at two, three or four temperature points. A comparison method to NIST standard PRT (Primary Reference Thermometer) is used. This allows for maintaining a calibration uncertainty of as low as .03° C. Calibration testing is available at any temperature between -35° C and 1250° C as well as cryogenic temperature of -195.6° C. Detailed calibration report is submitted with shipment showing test results. Temperature points are required at time of order except for selection AP1 for which the probe calibration is carried out at two fixed temperature points, 0 Deg C & 100 Deg C.

Selection TC1 & TC2 Transmitter with Probe System Calibration

Using our system calibration, the transmitter is calibrated at the customers selected zero and span points using the actual sensor as the input rather than a standard. This means the transmitter calibration eliminates the probes inherent error. This allows the system accuracy to exceed from what it would normally achieve when calibrating the probe and transmitter separately.

Selection CVD – CVD coefficients for RTD sensors

Callender – van Dusen (CVD) algorithm describes the relationship between Resistance and Temperature of Platinum RTD sensor and allows entering the unique parameters of characterized RTD into a transmitter. This transmitter – sensor matching provides the most accurate temperature measurement system. It eliminates the sensor interchangeability error, which is the significant source of system error.

Selection PT1 & PT2, Hydrostatic Testing (PT1 only on Socket wells)

Hydrostatic testing is a diagnostic technique to check for leaks or defects by means of slowly increasing water pressure in a line or chamber to a pre-determined setting. A visual inspection is performed to determine if any leakage exists or if the pressure set point reduces. Thermowells are mostly internally pressure tested, flanged and threaded thermowells may be externally tested. Testing pressure is recommended at the process maximum pressure or at 1.5 times the pressure rating in accordance with ANSI B16.5.

Selection FPW, Full Penetration Weld (Flanged Thermowells)

The most secure method of connecting the flange to the well is with a full penetration weld. In this, the flange is over bored to allow the well material to make full contact for the entire length of the connection. With a full penetration welded connection, the integrity of the connection is excellent. While this is much more costly in initial procurement cost, it can save significant long-term cost in the life and performance of the thermowell. Again, proper welding procedures are critical.

Selection HT1, NACE Certificate

Certification of material to the maximum hardness guidelines for sour service is found in NACE MR0175.

Selection FRQ Frequency Calculation

Thermowells must be carefully selected for processes where significant velocity is present. By penetrating the process flow, the thermowell is subject to the stress and friction of the flow. This may set up a natural vibration in the well. If this is not done correctly, the vibration will be such that the well will shear off in the process. This can be especially troublesome in high velocity steam lines. As the engineer needs to have the well deep enough into the process to accurately measure the temperature, the selection of the length and diameter of the well needs to be checked against the process to ensure that they are compatible. This is done through a calculation known as a Murdock. This calculation will determine whether a thermowell will be acceptable for the proposed process. The Von Karman Trail refers to the turbulent wake, which is formed as fluid flows past the thermowell. A vibration frequency is determined by the diameter of the thermowell and the fluid velocity. Should this frequency equal the natural frequency of the thermowell it will cause the thermowell to vibrate to the point where it will break off? Therefore, it is important that the thermowell is designed to insure the natural frequency of the thermowell always exceeds the potential wake frequency.




Selection TMC Thermowell Material Certificate

The bar stock and flange supplier certifications are traceable to the lot, batch, or heat number lot in accordance with the applicable specification. A Mill Test Report or MTR is documentation that shows the chemical makeup and physical strength/properties of materials (bar stock, flanges) used in fabrication of thermowells required to meet ASME and ASTM grades. The MTR shows the percentage of alloy used through chemical analysis and mechanical tests of a sample piece to represent the whole batch of a run of material. The MTR proves that the material received meets the grade required. The company that does the testing from the mill itself issues this or by an outside company who tests for the mill. The MTR's include approval as define in EN 10204 3.1B assuring the manufacturer's authorized representation is independent of manufacturing.

Selection CRN Canadian Register Number

The Canadian Registration Number (CRN) is a number issued by each province or territory of Canada to the design of a boiler, pressure vessel or fitting. Fitting being the thermowell has been accepted and registered for use in that province or territory. Numeric digits following the decimal point within the CRN represent the province or territory.

Certifications**NOTICE:** The Certifications listed below are owned by Thermo Electric Company, Inc.

Table III MSG Code	Agency	Description
A	FM Approvals	Thermo Electric's FM Approval: FMUS0125X Class I Division 1, Groups A, B, C, D; T6..T4 Class II, Division 1, Groups E, F, G, Class III, Division 1; T6..T4 T4, T5: Ta=-50°C TO + 85°C T6 : Ta=-50°C TO + 65°C Enclosure; Type 4/4X, IP66 42V, 4-20mA: HART and DE 32V, 25mA: Foundation Fieldbus
B	CSA	Thermo Electric's FM Approval: CSA 1896285 TABLE III, CSA Certification= B Class I, Division 1, Groups B, C and D; Class II, Division 1, Groups E, F, G; Class III; T6...T5: T6: Ta = -50°C to +65°C T5: Ta = -50°C to +85°C Enclosure: Type 4X/ IP66/ IP67 42V, 4-20mA: HART and DE 32V, 25mA: Foundation Fieldbus
C	ATEX Flameproof	Thermo Electric's BASEEFA 18ATEX0114X II 2 GD  Ex db IIC T6...T5 Gb T6: Ta = -50°C to +65°C T5: Ta = -50°C to +85°C  Ex tb IIIC T95°C Db Ta= -50°C to +85°C Enclosure: IP66 42V, 4-20mA: HART and DE 32V, 25mA: Foundation Fieldbus
D	IECEX Flameproof	Thermo Electric's IECEX BAS 18.0075X Ex db IIC T6...T5 Gb T6: Ta = -50°C to +65°C T5: Ta = -50°C to +85°C Ex tb IIIC T95°C Db Ta= -50°C to +85°C Enclosure: IP66 42V, 4-20mA, HART and DE 32V, 25mA: Foundation Fieldbus
T	ATEX, Intrinsically Safe	Thermo Electric's BASEEFA 18ATEX0114X  II 1 GD Ex ia IIC T4 Ga Ex ia IIIC T ₂₀₀ 95°C Da Ta= -50°C to +70°C Enclosure: IP66 U _i ≤ 30V, I _i ≤ 225mA, P _i ≤ 0.9W, C _i = 4nF Li =0μH: HART and DE U _i ≤ 30V, I _i ≤ 225mA, P _i ≤ 1.0W, C _i = 0nF Li =0μH: Foundation Fieldbus
U	IECEX, Intrinsically Safe	Thermo Electric's IECEX BAS 18.0075X Ex ia IIC T6 Ga Ex ia IIIC T ₂₀₀ 95°C Db Ta= -40°C to +70°C Enclosure: IP66 U _i ≤ 30V, I _i ≤ 225mA, P _i ≤ 0.9W, C _i = 4nF Li =0μH: HART and DE U _i ≤ 30V, I _i ≤ 225mA, P _i ≤ 1.0W, C _i = 0nF Li =0μH: Foundation Fieldbus

Model Selection Guide

The Model Selection Guide is subject to change and is inserted into the specification as guidance only.



**SmartLine Temperature Probe Assemblies
Series STT85A**

Section 13
Page: STT8-3
Effective Date: July 01, 2023



Model Selection Guide: 34-44-16-40 Issue 12

Honeywell Proprietary

Instructions: Make selections from all Tables Key through XV using column below the proper arrow. Asterisk indicates availability. Letter (a) refer to restrictions highlighted in the restrictions table. Tables delimited with dashes.
List Price: Price equals the sum of prices for all selections made

Key	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
STT85A	-	-	-	-	-	-	-	-	-	-	-	-	-	-

KEY NUMBER	Input Type
	Universal Input - Wired to STT850

Selection	Availability
STT85A	*

Table I	No of inputs
Input Details	Single Dual

S	*
T	e

Table II	Digital Output
Digital Output	No Yes

0	*
1	a

TABLE III	Agency Approvals (see data sheet for Approval Code Details)
Approvals	No Approvals Required FM Explosion proof & Dustproof CSA Explosion proof & Dustproof ATEX Explosion proof & Dustproof ATEX Intrinsically Safe IECEX Explosion proof & Dustproof IECEX Intrinsically Safe

0	*
A	*
B	*
C	*
T	*
D	*
U	*

TABLE IV	TRANSMITTER ELECTRONICS SELECTIONS		
a. Electronic Housing Material & Connection Type	Housing and Material	Connection	Lightning protection
	Polyester Powder Coated Aluminum 316 Stainless Steel (Grade CF8M)	1/2 NPT 1/2 NPT	Yes Yes
b. Output/ Protocol	Analog Output	Digital Protocol	
	4-20mA dc 4-20mA dc none	HART Protocol DE Protocol Foundation Fieldbus	
c. Customer Interface Selections	Display	Ext Zero, Span & Config Buttons	Languages
	None None	None Yes (Zero/Span Only)	None None
	Advanced	None	EN,GR,FR,IT,SP,RU,TU
	Advanced	Yes	EN,GR,FR,IT,SP,RU,TU
	Advanced	None	EN, CH, JP
Advanced	Yes	EN, CH, JP	

C__	*
G__	*

H	*
D	*
F	*

__0	*
__A	f
__D	*
__E	*
__H	*
__J	*

TABLE V	CONFIGURATION SELECTIONS		
a. Application Software	Diagnostics		
	Standard Diagnostics Advanced Diagnostics - Rate of Change and Deviation Alarm		
b. Output Limit, Failsafe & Write Protect Settings	Write Protect	Fail Mode	High & Low Output Limits ³
	Disabled	High> 21.0mAdc Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc) Honeywell Std (3.8 - 20.8 mAdc)
	Enabled	High> 21.0mAdc Low< 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc) Honeywell Std (3.8 - 20.8 mAdc)
	Enabled	N/A	N/A Fieldbus
	Disabled	N/A	N/A Fieldbus
c. General Configuration	Factory Standard Custom Configuration		

1__	*
2__	c

1	f
2	f
3	f
4	f
5	g
6	g

__S	*
__C	*

³ NAMUR Output Limits 3.8 - 20.5mAdc can be configured by the customer or select custom configuration Table Vc

TABLE V		CONFIGURATION SELECTIONS		
a. Application Software	Diagnostics			
	Standard Diagnostics			
	Advanced Diagnostics - Rate of Change and Deviation Alarm			
b. Output Limit, Failsafe & Write Protect Settings	Write Protect		Fail Mode	
	Disabled	High > 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)	
	Disabled	Low < 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)	
	Enabled	High > 21.0mAdc	Honeywell Std (3.8 - 20.8 mAdc)	
	Enabled	Low < 3.6mAdc	Honeywell Std (3.8 - 20.8 mAdc)	
	Enabled	N/A	N/A Fieldbus	
c. General Configuration	Factory Standard			
	Custom Configuration			

1 __	*
2 __	c
_ 1 _	f
_ 2 _	f
_ 3 _	f
_ 4 _	f
_ 5 _	g
_ 6 _	g
_ _ S	*
_ _ C	*

³ NAMUR Output Limits 3.8 - 20.5mAdc can be configured by the customer or select custom configuration Table Vc

TABLE VI		CALIBRATION & ACCURACY SELECTIONS		
Accuracy and Calibration	Accuracy	Calibrated Range		Calibration Qty
	Standard	Factory Std		Single Calibration
	Standard	Custom (Unit Data Required)		Single Calibration

A	*
B	*

TABLE VII		ACCESSORY SELECTIONS	
a. Mounting Bracket	Bracket Type		Material
	None		None
b. Customer Tag	Customer Tag Type		
	No customer tag		
	One Wired Stainless Steel Tag (Up to 4 lines 26 char/line)		
	Two Wired Stainless Steel Tag (Up to 4 lines 26 char/line)		
c. Unassembled Conduit Plugs & Adapters	Unassembled Conduit Plugs & Adapters		
	No Conduit Plugs or Adapters Required		
	1/2 NPT Male to M20 Female 316 SS Certified Conduit Adapter (qty 2)		
	1/2 NPT Male to 3/4 NPT Female 316 SS Certified Conduit Adapter		
	Minifast® 4 pin (1/2 NPT) (not suitable for X-Proof applications)		

0	*
_ 0 _	*
_ 1 _	*
_ 2 _	*
_ 3 _	*
_ _ A0	*
_ _ A1	n
_ _ A2	n
_ _ A8	n

TABLE VIII		Other Certifications and Options (String in sequence comma delimited (XX,XX,XX...))	
Certifications and Warranty	None - No additional options		
	SIL2/3 Certificate for transmitter		

00	*
FE	j

TABLE IX		Manufacturing Specials	
Factory	Factory Identification		

0000	*
------	---

TABLE X		Probe and Thermowell Type	
Probe Type & Assembly	Rigid Probe Assembly		
	Threaded Bar Stock Thermowell Assembly		
	Flanged Bar Stock Thermowell Assembly		

R	v
T	y
F	z

TABLE XI		Sensor Selections			
a. Sensor element	Thermocouples				
	1 x Type J (IEC); Class 1				
	2 x Type J (IEC); Class 1				
	1 x Type K (IEC); Class 1				
	2 x Type K (IEC); Class 1				
	RTD Applications (-58 to +500°F), Class A, Wire-wound				
	1 x Pt100 (IEC), 3-wire				
	1 x Pt100 (IEC), 4-wire				
	2 x Pt100 (IEC), 3-wire				
	RTD Applications (-292 to +932°F), Class A, Wire-wound				
	1 x Pt100 (IEC), 3-wire				
	1 x Pt100 (IEC), 4-wire				
2 x Pt100 (IEC), 3-wire					
b. Sensor Grounding	Grounded (standard for T/Cs and not applicable for RTDs)				
	Ungrounded (standard for RTDs but also applicable for T/Cs)				
c. Lead length	Factory Default				

T1 __	•
T2 __	•
T3 __	•
T4 __	•
R2 __	•
R3 __	•
R4 __	•
H2 __	•
H3 __	•
H4 __	•
_ _ G _	q
_ _ U	•
_ _ _ D	•

TABLE XII		Extension Type, Length & Material Selections				
Extension Type, Length & Material Selection	Extension Type	"A" Length	Nipple	Union	Nipple	
	No extension	N/A	N/A	N/A	N/A	
	3" Straight nipple	2 in	N/A	N/A	SS316	
	6" Straight nipple	5 in	N/A	N/A	SS316	
	Nipple-union-nipple	5 in	Carbon Stl.	Carbon Stl.	Carbon Stl.	
	Nipple-union-nipple	5 in	SS316	SS316	SS316	
	Nipple-XP union-nipple	5 in	SS316	SS316	SS316	
	Hex nipple only	1 in.	SS316 (Hex)	N/A	N/A	
	Hex nipple-union-nipple	5 in.	SS316 (Hex)	SS316	SS316	
	Hex nipple-XP union-nipple	5 in	SS316 (Hex)	SS316	SS316	

0000	•
N03S	u
N06S	u
U06C	u
U06S	u
E06S	•
H02S	•
H06S	u
X06S	•

Table XIII		Thermowell Selection					
Type	Dimensions in Inches						
	Tapered Stem			Straight Stem			
	OD-1	OD-2	ID	OD-1	OD-2	ID	
a. Process Connection - Threaded, Socket weld	No threaded process connection (or thermowell)	n/a	n/a	n/a	n/a	n/a	n/a
	1/2" NPT	0.500	0.630	0.260	0.630	0.63	0.260
	1/2" BSP	0.630	0.844	0.260	0.750	0.750	0.260
	3/4" NPT	0.630	0.844	0.385	0.750	0.750	0.385
	3/4" NPT	0.630	0.844	0.260	0.750	0.750	0.260
	3/4" BSP	0.630	0.844	0.385	0.750	0.750	0.385
	3/4" BSP	0.630	0.844	0.260	n/a	n/a	n/a
	3/4" NPS SW	0.500	0.630	0.260	0.630	0.630	0.260
	M20 x 1.5						
	b. Well Dimensions - Flanged Thermowell	Thermowell Dimensions	None		None		ID
Tapered			0.750	0.880	0.260	0.385	
Straight			0.880	0.880	0.260	0.385	
c. Process Connection - Flanged	Flanged connection	Size	Material		Rating		
		None	N/A		N/A		
	Flanged - Raised Face	1 in.	316 Stn. Stl/316L Stn. Stl Dual certified	150 lbs			
				300 lbs			
				600 lbs			
		1.5 in.		900 lbs			
				1500 lbs			
				2500 lbs			
	2 in.	150 lbs					
		300 lbs					
600 lbs							
900 lbs							
d. Lagging Length "F" Standard Length 1.75"	No Lag						
	2.25 in						
e. Well design	No Thermowell						
	Tapered						
f. Well & Flange material	Straight						
	No Thermowell						
g. Insertion length	316/316L Stainless Steel Dual Certified						
	0 in (No Thermowell)						
	3 in						
	4 in						
	5 in						
	6 in						
	7 in						
	8 in						
	9 in						
	10 in						
	11 in						
	12 in						
	13 in						
	14 in						
	15 in						
	16 in						
	17 in						
	18 in						
	19 in						
	20 in						
21 in							
22 in							
23 in							
24 in							
25 in							
26 in							
27 in							
28 in							
29 in							
30 in							
h. Insertion length (decimal)	Decimal					.00 in or No sensor	
						25 in	
						.50 in	
						75 in	

00	•
TA	•
TB	•
TC	•
TD	•
TE	•
TF	•
TM	p
TP	•
0	•
A	1
B	1
C	2
D	2
00	•
RA	•
RB	•
RC	•
RD	•
RE	•
RF	•
RG	•
RH	•
RJ	•
RK	•
RL	•
RM	•
RN	•
RP	•
RQ	•
RR	•
RS	•
RT	•
00	i
05	•
10	•
15	•
20	•
25	•
30	•
0	w
T	•
S	•
0	w
R	•
00	x
03	•
04	•
05	•
06	•
07	•
08	•
09	•
10	•
11	•
12	•
13	•
14	•
15	•
16	•
17	•
18	•
19	•
20	•
21	•
22	•
23	•
24	•
25	•
26	•
27	•
28	•
29	•
30	•
0	•
2	•
5	•
7	•

TABLE XIV	Assembly Options (String in sequence comma delimited (XXX,XXX,XXX...))
Assembly options	None - No additional options
	Certificate of conformance
	Certificate of Origin
	CVD coefficients for RTD sensors
	Internal hydrostatic pressure test (2500 PSI Standard)
	External hydrostatic pressure test (2500 PSI Standard)
	PMI Certification
	Full Penetration Weld
	Dye Penetrant Test
	NACE certificate (applies to Well)
	Frequency calculation (ASME PTC-19.3 TW-2016 - Velocity,pressure,Temp reqd)
	Thermowell material certificate
	Canadian registration number (CRN)
	Transmitter with Probe calibration (system) @ 2 points, Single Sensor(Specify range)
	Transmitter with Probe calibration (system)@ 2 points, Duplex Sensor(Specify range)
Probe Calibration Data Certificate (2-point, 0 & 100 degC)	
Probe Calibration Data Certificate (2-point info to be provided)	
Probe Calibration Data Certificate (3-point info to be provided)	
Probe Calibration Data Certificate (5-point info to be provided)	

000	•	b
COC	•	
COO	•	
CVD	s	
PT1	k	
PT2	o	
PMI	•	
FPW	r	
DPT	r	
HT1	k	
FRQ	k	
TMC	k	
CRN	k	
TC1	t	
TC2	t	
AP1	•	
AP2	•	
AP3	•	
AP5	•	

* For additional information, contact your Honeywell Account Manager or Honeywell Authorized distributor
 NOTICE: The temperature probe, extension hardware and thermowell are supplied and certified by Thermo Electric Company, Inc. The temperature transmitter is supplied by Honeywell International Inc.

MODEL RESTRICTIONS

Restriction Letter	Available Only with		Not Available with	
	Table	Selection(s)	Table	Selection(s)
a	I	S		
	IVb	_H_		
c			IVb	_D,F_
e	II	0		
f			IVb	_F_
g			IVb	_H,D_
h			II	1
i			X	F
j	IVb	_H_	Vb	_1,2,5,6_
k	X	T, F		
n	IVa	A,C,E,G_		
o	X	T, F	XIIIa	00, TM_-----
p	XIIIe	-----T-----		
q	XIa	T1,T2,T3,T4_		
r	X	F		
s	XIa	R2,R3,R4,H2,H3,H4_		
t	Vc	__C		
u	III	0		
v	XII	0000		
	XIII	00000000_		
w	X	R		
	XIIIa	00_-----		
x	XIII	00000_-----		
	XIIIa	-----		
y	XIIIb	__0_-----		
	XIIIc	__00_-----		
	XIIIa	00_-----	XIIIc	__00_-----
z	XIIIb	__A,B,C,D_-----		
	XIIIe	-----T-----		
1	XIIIe	-----T-----		
2	XIIIe	-----S-----		
b	Select only one option from this group			

FIELD INSTALLABLE REPLACEMENT PARTS

Description
Integrally Mounted Basic Indicator Kit (Compatible with all Electronic Modules)
Integrally Mounted Advanced Indicator Kit (compatible with all Electronic Modules)
Single Input Terminal Strip w/Lightning Protection for HART or DE Modules
Dual Input Terminal Strip w/Lightning Protection Kit for HART or DE Modules
Single Input Terminal Strip w/Lightning Protection Kit for FFB/Profibus Module
Dual Input Terminal Strip w/Lightning Protection FFB/Profibus Module
HART Electronics Module Kit
HART Electronics Module w/connection for external configuration buttons
DE Electronics Module Kit
DE Electronics Module w/connection for external configuration buttons
FFB Electronics Module Kit
FFB Electronics Module w/connection for external configuration buttons
FFB Replacement Kit TB-COMM SGL W/LP W/O REED SENSOR
FFB Replacement Kit TB-COMM SGL W/LP W/ REED SENSOR
FFB Replacement Kit TB-COMM DBL W/LP W/O REED SENSOR
FFB Replacement Kit TB-COMM DBL W/LP W/REED SENSOR

Kit Number
50049911-502
50049846-503
50086421-503
50086421-504
50086421-509
50086421-510
50086423-501
50086423-502
50086423-503
50086423-504
50086423-505
50086423-506
50187380-501
50187380-502
50187380-503
50187380-504

Price
Note P
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Note P
Note P
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Note P
Note P

Note P - For part number pricing please refer to WEB Channel.

TRANSMITTER PRODUCT MANUALS

Description
Product Manual STT850 Smart Temperature Transmitter User Manual - English
Product Manual STT850 Smart Temperature Transmitter Safety Manual - English
Product Manual STT850 Smart Temperature Transmitter HART/DE Communications Manual - English
Product Manual STT850 Smart Temperature Transmitter Foundation Fieldbus Manual - English

Part Number
34-TT-25-03
34-TT-25-05
34-TT-25-06
34-TT-25-07

All product documentation is available at www.process.honeywell.com

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

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engine <http://bit.ly/2N5Vldi>

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engine <http://bit.ly/2N5Vldi>

Specifications are subject to change without notice

For more information

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