# A Guide to Temperature Sensors and Thermowells

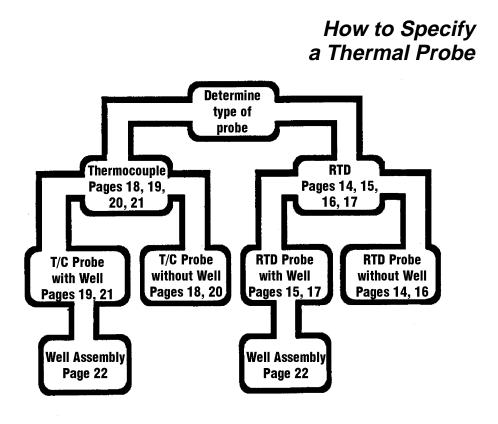
for STT 3000 Smart Temperature Transmitters and SMV 3000 Smart Multivariable Transmitters

> 34-44-29-01 12/97

	Contents
Introduction	2
How to Specify a Thermal Probe	2
Model Selection Guide: Probes Rigid RTD Probes Rigid Thermocouple Probes Spring-Loaded RTD Probes Spring-Loaded Thermocouple Probes	15
Model Selection Guide: Thermowells	24

### Introduction

This guide is intended to lead you through the proper specification of thermal probes and thermowell assemblies. Since we couldn't include all of the possible variations, the information in the document is intended to cover the most commonly used probes and thermowells. If you need assistance with the specification of a probe or well, or you want a type of probe or thermowell not included in this document, a Honeywell representative can assist you.



NOTE:

- 1. Always specify a spring-loaded probe if a thermowell is required for the application.
- 2. Rigid probes may be inserted directly, without a thermowell.

#### Thermocouples and RTDs

The two most common types of thermal sensors are thermocouples (T/Cs) and resistance temperature detectors (RTDs). Thermocouples are often selected because of their wide temperature limits (-184°C to +2330°C). Thermocouples are specified on a basis of their temperature profiles and their accuracy within their intended operating ranges.

RTDs are more accurate than thermocouples, although they won't withstand high temperatures as well. the operating range for RTDs is typically -200° to +500°C. RTDs are specified based on their intended applications and required accuracy.

#### **Types of Thermocouple and RTD Probes**

Honeywell provides both rigid and spring-loaded probes:

- If you are going to use a thermowell assembly with the probe, specify a spring-loaded probe. Spring-loading applies pressure where the probe tip touches the thermowell, and increases heat transfer.
- If the probe will be inserted directly into the process without a thermowell, specify a rigid probe.

#### **Probe Sheath Material**

We offer two materials for probe sheath construction; 316 Stainless Steel and Inconel. For probes used with wells, specify 316 SS. Inconel is often used where a rigid probe is used in direct contact with a corrosive materials, or extreme heat is involved (in excess of 3000°F).

#### **Grounded and Ungrounded Thermocouples**

You may specify grounded or ungrounded thermocouples. The STT 3000 and SMV 3000 is optically isolated and can be used with either type. A grounded thermocouple is used to prevent electrical noise, and the tip of the thermocouple is electrically connected to the sheath of the probe. Ungrounded thermocouples use insulation material to keep the thermocouple tip insulated from the probe sheath.

NOTE: Grounded T/Cs have faster response time, and are most commonly specified.

#### **Single Element and Dual Element Thermocouples**

Thermocouples are available with single or dual elements in a single probe. The single thermocouple is the most common. However, dual thermocouples may be used to provide spare thermocouples in a single probe assembly.

Select single unless otherwise specified.

#### **Probe Lagging (Stand-off)**

Spring-loaded thermocouples and RTDs offer a "lagging" option (rigid probes do not). Probe lagging is used to extend the transmitter away from heat outside the insulation jacket. The STT 3000 is rated for a maximum of 85°C, and lagging may be required to get the transmitter electronics physically away from a heat source. The following probe lagging options are available:

- 3/4" Hex 1/2" NPT nipple (standard connection between probe and transmitter housing)
- 3", 6", 9", 12" lag (length of pipe nipple between probe and transmitter housing 1/2" NPT)
- 3", 8", 10", 14" nipple/union/nipple

If no probe lagging is specified, select 3/4" Hex.

#### **Thermowell Lagging**

Wells are also available with lagging. Well lagging is typically used where the well is installed through an insulating material. This is typically referred to as the "T" dimension.

#### **Spring-Loaded Probes**

All spring-loaded probes have 1/4" sheath diameters and 1/2" NPT connection threads. Spring-loaded probes should be specified with 3/4" long Hex nipple unless lagging is needed.

Computing probe "stem" length ("A" dimension)

The length of a thermocouple or RTD probe is computed as follows:

- 1. Determine the required insertion length ("U") dimension of the well.
- 2. Determine the required lag length ("T") dimension. This is the lagging length specified on the well.
- 3. Determine the type of well process connection: threaded, flanged or socket.

Choose a stem length greater than 3". The standard length is 6". For FM approved, the stem length plus lag hardware length cannot exceed 24".

For threaded or socket wells, the probe length is the total of the insertion length, the lag length plus a fixed 1-1/2".

A=U+T+1.5

EXAMPLE: Insertion length (U) = 6"

Lagging length (T) = 3" (lagging on the well)

Threaded well = 1.5" (fixed)

Total probe length (A) = 10.5"

For flanged wells, the probe length is the total of the insertion length and a fixed 2".

A = U+2

EXAMPLE: Insertion length (U) = 9

Flanged well = 2"
Total probe length (A) = 11.0

NOTE: For rigid probes, lagging occurs at the other end of the probe.

#### **Rigid Probes**

All rigid probes have 1/4" sheath diameters and utilize a 3/4" long 316SS Hex nipple with 1/2" NPT connection threads.

The probe stem length ("A") dimension for rigid probes is specified as the total length of the probe stem, and does not require further calculation. Choose a stem length between 3 and 24". The standard stem length is 6".

#### **Remote Connection Heads**

You may order a probe assembly with either a local or remote connection head. The local connection head specifies that the probe will be mounted directly to a STT 3000 housing. A remote head specifies a separate head mounted to the probe, and wired to a remote transmitter. A remote connection head should be used where the ambient temperature surrounding the probe is higher than the STT 3000 or SMV 3000 can withstand even with appropriate lagging.

Additionally, remote heads can be ordered for explosion-proof and non-explosion-proof environments. Explosion-proof heads are made of cast aluminum, while the non-explosion-proof heads are available in either plastic or polypropylene versions.

*Note:* The probe model numbers for STT 3000 assembled (local) and remote connection heads are different due to the need for a specific model number convention required for FM/CSA approval for probes connected directly to the STT 3000 housing. Connection heads are generally used as protection for sensor leadwire and as a junction point for leadwires going to other instrumentation. Connection heads have either screwed on or hinged/latched covers, internal terminal boards, and 1/2" NPT female pipe threads for process connections.

All Honeywell remote mounted connection heads are now available in three types:

#### **Cast Aluminum Head (Standard)**

Explosion-proof design for use in areas with explosive or combustible materials, for use in environments up to 500°F ambient, meets NEMA 4 standards for dust and moisture resistance, 1/2" NPT sensor and conduit connection standard. FM approved versions are available. Measures approximately 2.75" x 2.75".

#### **Polypropylene Head**

Non-explosion-proof design, for use in environments up to 200°F ambient, meets NEMA 4 standards for dust and moisture resistance, 3/4" NPT conduit connection with 1/2" NPT sensor connection standard. Measures approximately 3.75" x 3.75".

#### Plastic Head (PVC)

Non-explosion-proof design for use near corrosive processes, for use in environments up to 250°F ambient, meets NEMA 4 standards for dust and moisture resistance, 3/4" NPT conduit connection with 1/2" NPT sensor connection standard. Measures approximately 4.00" x 4.00".

#### **Process Connection (Rigid Probes)**

A rigid probe inserted directly into the process will have a standard process connection of 1/2" NPT (also available in 3/4" and 1").

#### **Probe Service Parameter**

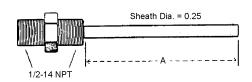
The RTD probe is available with standard and heavy duty parameters. The standard service parameter probe is built to handle up to 25 g's of vibration. The heavy duty probe is built to handle up to 50 g's. Select standard duty unless otherwise specified.

#### **Probe Lead Length**

The standard length of the wire leads coming out of the probe is 3 to 6".

### Type 2B Rigid RTD Probe





#### Type 2B Rigid RTD Probe Assemblies with Hex Fitting

*Operating Temperature:* -40 to +185°F

Vibration: 25 g's maximum standard, 50 g's optional

Sheath: 1/4" dia. 316 SS or Inconel 600

Lead Wire: AWG #22 nickel plated copper, stranded, Teflon insulated.

Lead Configurations 2, 3 wire (also 2 wire with comp. loop)

Resistance - Temperature Coefficient: Ref. (0.003923 ohm / ohm / C);

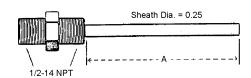
DIN (0.003850 ohm / ohm / C)

Explosion-Proof. Factory Mutual approved. Class I Div. 1 Groups B,C,D, Class II Div. 1 Groups E, F, G and Class III Hazardous Locations.

Not available with thermowell.

## Type 7B Rigid Thermocouple Probe





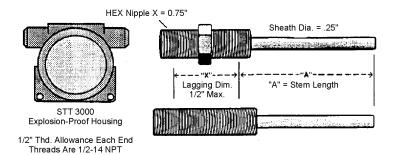
#### Type 7B Rigid Thermocouple Probe Assemblies with Hex Fitting

This probe is usually used in applications requiring direct immersion. It is available in 316 SS or Inconel 600 (1/4" dia.).

Explosion-Proof. Factory Mutual approved. Class I Div. 1 Groups B, C, D, Class II Div. 1 Groups E, F, G and Class III Hazardous Locations.

Not available with thermowell.

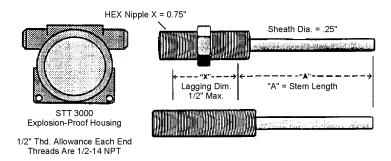
# Type 2D Spring-Loaded RTD Probe



## Type 2D Spring-Loaded RTD Probe Assemblies with Hex Fitting or Straight Nipple

Explosion-Proof. Factory Mutual approved. Class 1 Div. 1 Groups B, C, D, Class II Div. 1 Groups E, F, G and Class III Hazardous Locations.

# Type 7D Spring-Loaded Thermocouple Probe

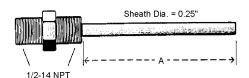


## Type 7D Spring-Loaded Thermocouple Probe Assemblies with Hex Fitting or Straight Nipple

Explosion-Proof. Factory mutual approval pending. Class I Div. 1 Groups B, C, D, Class II Div. 1 Groups E, F, G and Class III Hazardous Locations.

### Type 22B Rigid RTD Probe





Connection head is required for approved installations

#### Type 22B Rigid RTD Probe Assemblies with Hex Fitting

*Operating Temperature:* -320° to 900° F

Vibration: 25 g's maximum standard, 50 g's optional

Maximum Lead Exit Temperature: 500°F Sheath: 1/4" dia. 316 SS or Inconel 600

Lead Wire: AWG #22 nickel plated copper, stranded, Teflon insulated.

Lead Configurations: 2, 3 (also 2 wire with comp. loop)

Resistance - Temperature Coefficient: *Ref.* (0.003923 ohm / ohm / C);

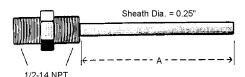
DIN (0.003850 ohm / ohm / C)

Explosion-Proof. Factory Mutual approved. Class I Div. 1 Groups B, C, D, Class II Div. 1 Groups E, F, G and Class III Hazardous Locations.

Not available with thermowell.

# Type 78B Rigid Thermocouple Probe





Connection head is required for approved installations.

### Type 78B Rigid Thermocouple Probe Assemblies with Hex Fitting

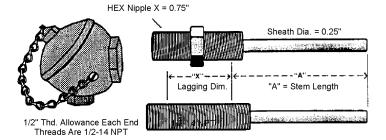
MGO Insulated Thermocouple

This probe is usually used in applications requiring direct immersion. It is available in 316 SS or Inconel 600 (1/4" dia.).

Explosion-Proof. Factory Mutual approved. Class 1 Div. 1 Groups B, C, D, Class II Div. 1 Groups E, F, G and Class III Hazardous Locations.

Not available with thermowell.

## Type 22D Spring-Loaded RTD Probe

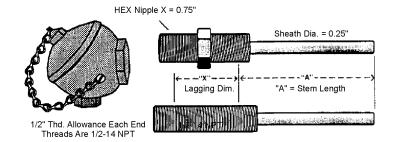


Thermowell and connection head are required for approved installations.

## Type 22D Spring-Loaded RTD Probe Assemblies with Hex Fitting or Straight Nipple

Explosion-Proof. Factory Mutual approved. Class I Div. 1 Groups B, C, D, Class II Div. 1 Groups E, F, G, and Class III Hazardous Locations.

# Type 78D Spring-Loaded Thermocouple Probe

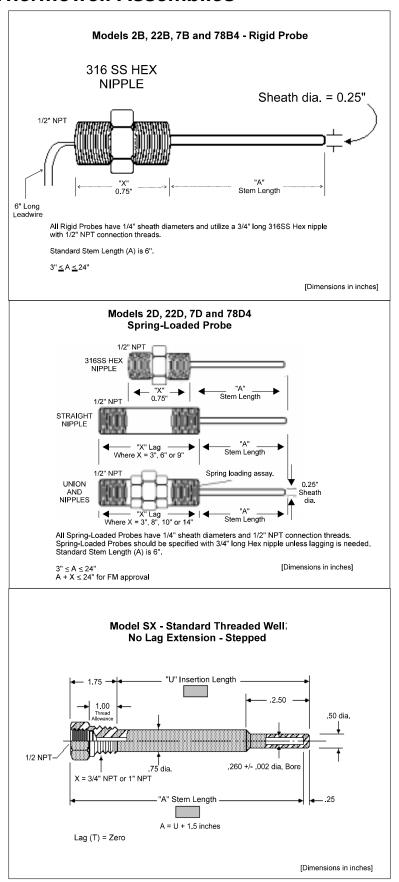


Thermowell and connection head are required for approved installations.

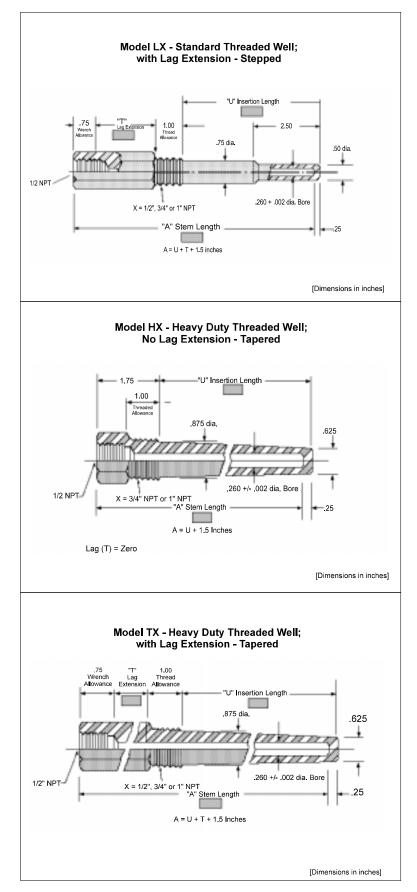
## Thermocouple Type 78D Spring-Loaded RTD Probe Assemblies with Hex Fitting or Straight Nipple

Explosion-Proof. Factory Mutual approved. Class I Div. 1 Groups B, C, D, Class II Div. 1 Groups E, F, G, and Class III Hazardous Locations.

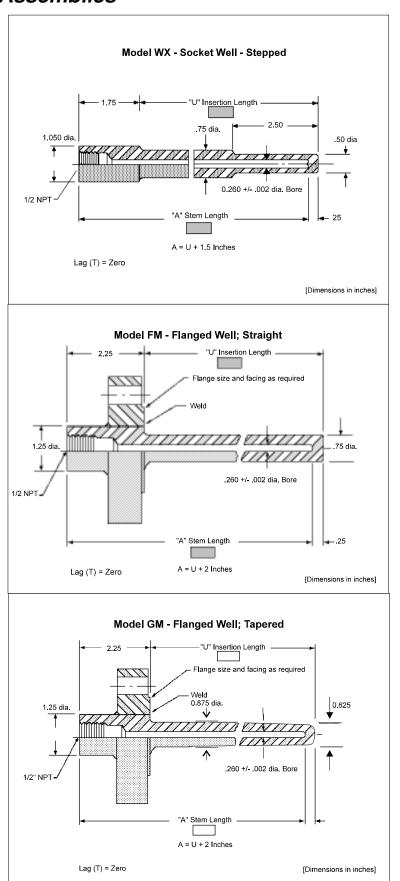
### **Probe and Thermowell Assemblies**



### Thermowell Assemblies



### Thermowell Assemblies



(Probe factory assembled to STT 3000 Smart Temperature Transmitter) 2B RIGID RTD PROBE (ASSEMBLED TO STT 3000) **CODE - SHEATH MATERIAL** Stainless Steel Inconel Other 0 **CODE - PROBE TYPE** Compatible w STT35x STT25x 100 ohm JIS (0.00392) Platinum ..... 100 ohm JIS (0.00392) Platinum (Dual Element) ...... Υ Υ 11 100 ohm DIN (0.00385) Platinum ..... Υ Υ Υ 112 100 ohm DIN (0.00385) Platinum (Dual Element) ..... Υ 21 200 ohm DIN (0.00385) Platinum ..... Υ Υ 500 ohm DIN (0.00385) Platinum ..... 51 Υ **CU10** 10 Ohm Copper ...... Υ CU25 25 Ohm Copper ...... Υ SP Other special requests ..... **CODE - NUMBER OF LEADWIRES** A 2-Wire Sensor B 3-Wire Sensor C 4-Wire Sensor **CODE - SERVICE PARAMETER** S Standard (25 gS) H Heavy Duty (50 gS) CODE - STEM LENGTH "A" DIMENSION A Stem Length; where A is in inches ( 3" minimum, 24" maximum) **CODE - CONNECTION HEAD** Assembled to STT 3000 Housing via 3/4" long 316 SS Hex nipple CODE - LEAD LENGTH Standard 6" Length CODE - OPTIONS SST3 Small wired-on SS Tag (3 lines of 10 digits) SST6 Large wired-on SS Tag (6 lines of 20 digits) CCxx Certificate of Probe Calibration (2-point) (2) Certificate of Probe Calibration (3-point) (2) CCxx Certificate of Probe Calibration (4-point) (2) CCxx Assembly Performance Data Certificate (3) APD (Probe with STT 3000) 6 SST6 - CC2F S | 11 | B | S | 6 |

- (2) Select Calibration Schedule (xx) from Table 1.
- (3) Specify LRV, URV and input type of transmitter on OP16-CC screen and select CCxx option. See Table 2 for Drawings, Manuals and Certificates.

(Probe factory assembled to STT 3000 Smart Temperature Transmitter) 2D SPRING-LOADED RTD PROBE (ASSEMBLED TO STT 3000) **CODE - SHEATH MATERIAL** Stainless Steel 1 Inconel 0 Other **CODE - PROBE TYPE** Compatible w STT35x STT25x 100 ohm JIS (0.00392) Platinum ..... 102 100 ohm JIS (0.00392) Platinum (Dual Element) ...... Υ Υ 11 100 ohm DIN (0.00385) Platinum ..... Υ Υ 112 100 ohm DIN (0.00385) Platinum (Dual Element) ..... Υ Υ Υ 21 200 ohm DIN (0.00385) Platinum ..... Υ 51 500 ohm DIN (0.00385) Platinum ..... Υ CU10 10 Ohm Copper ..... Υ CU25 25 Ohm Copper ..... Υ SP Other special requests ..... **CODE - NUMBER OF LEADWIRES** A 2-Wire Sensor B 3-Wire Sensor C 4-Wire Sensor **CODE - SERVICE PARAMETER** S Standard (25 gS) H Heavy Duty (50 gS) CODE - STEM LENGTH "A" DIMENSION A Stem Length; where A is in inches ( 3" minimum, 24" maximum) (4) CODE - PROBE LAG HARDWARE with 1/2"NPT SS FITTINGS A HEX Nipple as 3/4" long standard 316 SS. (Specify as "A") **BX** Specify straight nipple as "BX"; where X = 3", 6" or 9" lengths CX Specify double carbon steel lags and aluminum union as "CX", where: X = mated lengths of 3", 8", 10" or 14" **DX** Specify double SS lags and SS union as "DX", where: X = mated lengths of 3", 8", 10" or 14" (4) Note: Stem Length plus Probe Lag Length exceeding 24" total violates FM approval. Contact F.I. Marketing Applications for lengths > 24". CODE - CONNECTION HEAD Assembled to STT 3000 Housing via 3/4" long Hex nipple **CODE - LEAD LENGTH** Standard 6" Length CODE - OPTIONS SST3 Small wired-on SS Tag (3 lines of 10 digits) SST6 Large wired-on SS Tag (6 lines of 20 digits) CCxx Certificate of Probe Calibration (2-point) (2) Certificate of Probe Calibration (3-point) (2) CCxx Certificate of Probe Calibration (4-point) (2) CCxx Assembly Performance Data Certificate (3) APD (Probe with STT 3000) B | S | 6 **B3** S SST6 - CC2F

<sup>(2)</sup> Select Calibration Schedule (xx) from Table 1.

<sup>(3)</sup> Specify LRV, URV and input type of transmitter on OP16-CC screen and select CCxx option. See Table 2 for Drawings, Manuals and Certificates.

(Probe is NOT factory assembled to STT 3000 or SMV 3000 transmitter) 22B RIGID RTD REMOTE MOUNTED PROBE ASSEMBLY CODE - SHEATH MATERIAL Stainless Steel Inconel O Other **CODE - PROBE TYPE** Compatible w STT35x STT25x SMV 100 ohm JIS (0.00392) Platinum ..... 102 100 ohm JIS (0.00392) Platinum (Dual Element) ..... Υ Υ 11 100 ohm DIN (0.00385) Platinum ..... Υ Υ Υ 112 100 ohm DIN (0.00385) Platinum (Dual Element) ..... Υ Υ 200 ohm DIN (0.00385) Platinum ..... Υ 21 Υ 51 500 ohm DIN (0.00385) Platinum ..... Υ CU10 10 Ohm Copper ..... Υ CU25 25 Ohm Copper ..... Υ Other special requests ..... **CODE - NUMBER OF LEADWIRES** A 2-Wire Sensor B 3-Wire Sensor C 4-Wire Sensor **CODE - SERVICE PARAMETER** S Standard (25 gS) ..... H Heavy Duty (50 gS) CODE - STEM LENGTH "A" DIMENSION A Stem Length; where A is in inches ( 3" minimum, 24" maximum) CODE - REMOTE CONNECTION HEAD via 3/4" long 316 SS Hex nipple Explosion-proof, standard cast aluminum PL Plastic (not explosion-proof) PO Polypropylene (not explosion-proof) CODE - LEAD LENGTH (1) Minimum lead length, as required, 3 - 6 inches average lengt Lead length, as specified, greater than 6 inches where Y is in inches CODE - OPTIONS SST3 Small wired-on SS Tag (3 lines of 10 digits) SST6 Large wired-on SS Tag (6 lines of 20 digits) Certificate of Probe Calibration (2-point) (2) CCxx Certificate of Probe Calibration (3-point) (2) CCxx Certificate of Probe Calibration (4-point) (2) CCxx APD Assembly Performance Data Certificate (3) (Probe with STT 3000) R I A ISST6 - CC2F

- (1) Caution: Excessive lead lengths may result in lead wire damage due to space limitations within the remote head.
- (2) Select Calibration Schedule (xx) from Table 1.
- (3) Specify LRV, URV and input type of transmitter on OP16-CC screen and select CCxx option. See Table 2 for Drawings, Manuals and Certificates.

(Probe is NOT factory assembled to STT 3000 or SMV 3000 transmitter) 22D SPRING-LOADED RTD REMOTE MOUNTED PROBE ASSEMBLY CODE - SHEATH MATERIAL Stainless Steel Inconel 0 Other **CODE - PROBE TYPE** Compatible with: STT35x STT25x SMV 100 ohm JIS (0.00392) Platinum ..... 10 102 100 ohm JIS (0.00392) Platinum (Dual Element) ...... Υ Υ 11 100 ohm DIN (0.00385) Platinum ..... Υ Υ Υ 112 100 ohm DIN (0.00385) Platinum (Dual Element) ..... Υ Υ 200 ohm DIN (0.00385) Platinum ..... Υ 21 Υ 51 500 ohm DIN (0.00385) Platinum ..... Υ CU10 10 Ohm Copper ..... Υ **CU25** 25 Ohm Copper ...... Υ SP Other special requests ..... Υ **CODE - NUMBER OF LEADWIRES** A 2-Wire Sensor B 3-Wire Sensor 4-Wire Sensor CODE - SERVICE PARAMETER S Standard (25 qS) H Heavy Duty (50 gS) CODE - STEM LENGTH "A" DIMENSION A Stem Length; where A is in inches (3" minimum. 24" maximum) (4) CODE - PROBE LAG HARDWARE with 1/2"NPT SST FITTINGS HEX Nipple as 3/4" long standard 316 SS. (Specify as "A") Specify straight nipple as "BX"; where X = 3", 6" or 9" lengths **CX** Specify double carbon steel lags and aluminum union as "CX", where: X = mated lengths of 3", 8", 10" or 14" Specify double SS lags and SS union as "DX", where: X = mated lengths of 3", 8", 10" or 14" (4) Note: Stem Length plus Probe Lag Length exceeding 24" total violates FM approval. Contact F.I. Marketing Applications for lengths > 24". CODE - REMOTE CONNECTION HEAD via 3/4" long 316 SS Hex nipple Explosion-proof, standard cast aluminum Plastic (not explosion-proof) Polypropylene (not explosion-proof) PΩ CODE -**LEAD LENGTH** (1)
Minimum lead length, as required, 3 - 6 inches avg. Lead length, as specified, greater than 6 inches where Y is in inches CODE - OPTIONS SST3 Small wire Small wired-on SS Tag (3 lines of 10 digits) SST6 Large wired-on SS Tag (6 lines of 20 digits) Certificate of Probe Calibration (2-point) (2) CCxx Certificate of Probe Calibration (3-point) (2) CCxx CCxx Certificate of Probe Calibration (4-point) (2) Assembly Performance Data Certificate (3) APD (Probe with STT 3000) SST6 - CC2F 22D **B3** Α

- (1) Caution: Excessive lead lengths may result in lead wire damage due to space limitations within the remote head.
- (2) Select Calibration Schedule (xx) from Table 1.
- (3) Specify LRV, URV and input type of transmitter on OP16-CC screen and select CCxx option.

See Table 2 in Drawings, Manuals and Certificates.

7B	RIGIE	T/C PR	ROBI	,		•		oled to ST	T 3000 Smart Ter	mpera	ature Trans	smitter)	
	S I	E - SHE Stainle Incone	ess S		ΓERI	AL							
	- 0	Other  CODE B C D E J K N R S T NiNiM SP	- T\	er sp DE - Sin Dua COI G	NUM gle e al ele Grou Ungi	request BER OI lement ment TYPE J unded rounded DE - PF Stem le	UUNC  ROBE ength Ass	E STEM LI, where A  DNNECTION  DE - LEA  Standar	ENGTH is in inches (3" m DN HEAD D STT 3000 House D LENGTH d 6" Length  OPTIONS Small wired-on Large wired-on Certificate of Pr	SS Trobe (crobe Corman	Y Y Y Y Im, 24" ma a 3/4" long ag (3 lines ag (6 lines Calibration Calibration Calibration nce Data C	of 10 digit of 20 digit (2-point) (3 (3-point) (4	s) s) s) 2)
7B	S	J	S	G	6	S	6	SST6 - C	C2F				

<sup>(2)</sup> Select Calibration Schedule (xx) from Table 1.

<sup>(3)</sup> Specify LRV, URV and input type of transmitter on OP16-CC screen and select CCxx option. See Table 2 in Drawings, Manuals and Certificates.

COD	<b>E - SH</b> l Stain				AL							
ا ا	Incor	nel	sieei									
Ü	CODE	-	YPE :	T/C					Compatible v	vl STT35x	STT25x	
	В									Y	Υ	1
	C										-	
	E										Υ	
	J										Υ	
	K										Y	
	R									I	Y	
	s										Υ	
	T										Y	
	NiNiN SP								uracy T/Cs, e	"	Y	
							•					
		COL S			BER O	F ELI	EMENTS					
		Ď		al ele								
			<u> </u>	DE	TYPE	ILINIC	TION					
					unded	JUNC	IION					
			U	Ungr	rounded	i						
				<u> </u>								
				LOU	DE - PI	ROBE	STEM L	ENGTH				
							STEM L , where A		nes (3" minim	um, 24" ma	aximum) <sup>(4)</sup>	
					Stem le	ength	, where A	A is in inch				as
					Stem le	ength	, where A	A is in inch	nes (3" minim WARE with a g standard 3	1/2"NPT S	ST FITTING	_
					Stem le	ength - <b>PF</b> HEX	, where A ROBE LA Nipple a	A is in inch AG HARD Is 3/4" lon	WARE with	<b>1/2"NPT S:</b> 16 SS. (3	ST FITTING Specify as	"A")
					CODE A	- PF HEX Spec	, where AROBE LAR Nipple a cify straig	A is in inch  AG HARD  AS 3/4" Ion  Ight nipple  Ile carbon	WARE with g standard 3	<b>1/2"NPT S</b> 16 SS. (3) re X = 3", 6	ST FITTING Specify as " or 9" leng	"A") gths
					CODE A BX	ength  - PF  HEX  Spec	where A  ROBE LA  Nipple a  cify straig  cify doubl  X = mate	A is in inch  G HARD  IS 3/4" Ion  In the photo of the carbon  and lengths  Ile SS lags	WARE with g standard 3 as "BX"; whe	1/2"NPT S: 16 SS. (i re X = 3", 6 d aluminun " or 14" on as "DX",	ST FITTING Specify as " or 9" leng n union as	"A") gths
					CODE A BX CX DX	Species Specie	, where A ROBE LA Nipple a Nipple a cify straig cify doubl X = mate X = mate	A is in inch AG HARD Is 3/4" Ion Ight nipple Ile carbon ed lengths Ile SS lags ed lengths	WARE with a g standard 3 as "BX"; when steel lags and so of 3", 8", 10 as and SS unions.	1/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminum " or 14" on as "DX", " or 14"	ST FITTING Specify as " or 9" leng n union as where:	"A") gths "CX", wher
					CODE A BX CX DX	Species Stem	ROBE LA Nipple a Cify straig Cify doubl X = mate Cify doubl X = mate Cify doubl X = mate A Length pla TEI. Marka DE - CO Assemb	A is in inch  AG HARD  IS 3/4" Ion  Ight nipple  Ile carbon  ed lengths  Ile SS lags  ed lengths  Les Probe La  eting Applica  NNECTIC	ware with a g standard 3 as "BX"; when steel lags and so and SS unices of 3", 8", 10 and Length exceedations for length T 3000 Hous	1/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminum " or 14" on as "DX", " or 14" ding 24" total s > 24".	ST FITTING Specify as " or 9" leng n union as where: violates FM a	"A") gths "CX", when
					CODE A BX CX DX	Special Special Stem Contact	ROBE LA Nipple a Cify straig Cify doubl X = mate Cify doubl X = mate Cify doubl X = mate A Length pla TEI. Marka DE - CO Assemb	A is in inch  AG HARD  IS 3/4" Ion  Ight nipple  Ile carbon  ed lengths  Ile SS lags  ed lengths  LE Probe La  eting Applica  NNECTIC  Iled to ST  - LEAD L	ware with a g standard 3 as "BX"; when steel lags and so and SS unices of 3", 8", 10 and Length exceedations for length T 3000 Hous	1/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminum " or 14" on as "DX", " or 14" ding 24" total s > 24".	ST FITTING Specify as " or 9" leng n union as where: violates FM a	"A") gths "CX", when
					CODE A BX CX DX	Special Special Stem Contact	ROBE LA Nipple a Cify straig Cify doubl X = mate Cify doubl X = mate Cify doubl A = mate Comparison Code - CO Assemb	A is in inch  AG HARD  Is 3/4" Ion  In the nipple  Ile carbon  Ile SS lags  Ile SS lags  Ile Help the  Ile SS lags  Ile SS	ware with a g standard 3 as "BX"; when steel lags and so of 3", 8", 10 as and SS unides of 3", 8", 10 and ST at a standard properties of the standard proper	1/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminun " or 14" on as "DX", " or 14" ding 24" total s > 24".	ST FITTING Specify as " or 9" leng n union as where: violates FM a	"A")  gths  "CX", when  approval.
					CODE A BX CX DX	Special Special Stem Contact	ROBE LA Nipple a Cify straig Cify doubl X = mate Cify doubl X = mate Cify doubl A = mate Comparison Code - CO Assemb	A is in inch  AG HARD  Is 3/4" Ion  In in inple  Ide carbon  Ide carbon  Ide SS lags  Ide Ide Ide Ide  Ide Ide Ide  Ide Ide  Ide Ide  Ide Ide  Ide Ide  Ide Ide  Ide Ide  Ide Ide  Ide	ware with a g standard 3 as "BX"; when steel lags and so of 3", 8", 10 as and SS unides of 3", 8", 10 and Se of 3"	1/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminum " or 14" on as "DX", " or 14" ding 24" total s > 24".  ing via 3/4"  -on SS Tag	ST FITTING Specify as " or 9" leng n union as where: violates FM a long Hex r	"A")  gths  "CX", where  approval.
					CODE A BX CX DX	Special Special Stem Contact	ROBE LA Nipple a Cify straig Cify doubl X = mate Cify doubl X = mate Cify doubl A = mate Comparison Code - CO Assemb	A is in inch  AG HARD  Is 3/4" Ion  In the nipple  Ile carbon  Ile SS lags  Ile SS lags  Ile Help the  Ile SS lags  Ile SS	ware with a g standard 3 as "BX"; when steel lags and s of 3", 8", 10 as and SS unides of 3", 8", 10 and S	1/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminum " or 14" on as "DX", " or 14" ding 24" total s > 24".  -on SS Tag -on SS Tag	ST FITTING Specify as " or 9" leng n union as where: violates FM a long Hex r	"A") gths "CX", where approval. inipple in 10 digits) in 20 digits)
					CODE A BX CX DX	Special Special Stem Contact	ROBE LA Nipple a Cify straig Cify doubl X = mate Cify doubl X = mate Cify doubl A = mate Comparison Code - CO Assemb	A is in inch  G HARD  Is 3/4" Ion  In in inple  Ide carbon  Ide carbon  Ide carbon  Ide SS lags  Ide SS lags  Ide Ingths  Ide Ide Ide  Ide	g standard 3 as "BX"; when steel lags and s of 3", 8", 10 as and SS unides of 3", 8", 10 as a	1/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminum " or 14" on as "DX", " or 14" ding 24" total s > 24".  -on SS Tag of Probe Ca of Probe Ca	ST FITTING Specify as ST or 9" leng In union as where:  violates FMa  long Hex r  g (3 lines of g (6 lines of libration (2	"A") gths "CX", when approval. hipple 10 digits) 20 digits) -point) (2) -point) (2)
					CODE A BX CX DX	Special Special Stem Contact	ROBE LA Nipple a Cify straig Cify doubl X = mate Cify doubl X = mate Cify doubl A = mate Comparison Code - CO Assemb	A is in inch  G HARD  Is 3/4" Ion  Int nipple  Ile carbon  Ile Carbon  Ile SS lags	ware with a g standard 3 as "BX"; when steel lags and s of 3", 8", 10 as and SS unides of 3", 8", 10 and SS unides	I/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminum " or 14" on as "DX", " or 14" ding 24" total s > 24".  -on SS Tag -on SS Tag of Probe Ca of Probe Ca	ST FITTING Specify as " or 9" leng n union as where:  violates FMa long Hex r g (3 lines of g (6 lines of libration (3 dibration (4	"A") gths "CX", when approval.  10 digits) 20 digits) -point) (2) -point) (2) -point) (2)
					CODE A BX CX DX	Special Special Stem Contact	ROBE LA Nipple a Cify straig Cify doubl X = mate Cify doubl X = mate Cify doubl A = mate Comparison Code - CO Assemb	A is in inch  G HARD  Is 3/4" Ion  In in inple  Ide carbon  Ide carbon  Ide carbon  Ide SS lags  Ide SS lags  Ide Ingths  Ide Ide Ide  Ide	g standard 3 as "BX"; when steel lags and s of 3", 8", 10 as and SS unides of 3", 8", 10 as a	I/2"NPT S: 16 SS. (i) re X = 3", 6 d aluminum " or 14" on as "DX", " or 14" ding 24" total s > 24".  -on SS Tag -on SS Tag of Probe Ca of Probe Ca	ST FITTING Specify as " or 9" leng n union as where:  violates FMa long Hex r g (3 lines of g (6 lines of libration (3 dibration (4	"A") gths "CX", winding approval. https://discourse.ing.gt/ approval. digitized approval. approval. https://discourse.ing.gt/ approval.

- (2) Select Calibration Schedule (xx) from Table 1.
- (3) Specify LRV, URV and input type of transmitter on OP16-CC screen and select CCxx option.

See Table 2 for Drawings, Manuals and Certificates.

	E - SH			TERI/	AL							
S		less S	steel									
0	Incor Othe											
١٠	Othe	ı										
	CODE	E - T	YPE 1	T/C				Compatible w	STT35x	STT25x	SMV	I
	В								Y	Υ	-	
	C								Y	-	-	
	D								Y	-	-	
	E									Y	Y	
	J									Y	Y	
	K								Y	Y	Y	
	N R									Ϋ́	_	
	s								Y	Ϋ́	_	
	Ιŏ								\ <u>/</u>	Ÿ	Y	
	NININ								· · · ·		_	
	SP	_						ccuracy T/Cs, et		Υ	_	
			G	Grou Ungr	TYPE Junded rounded	I	TION STEM LENGT	Н				
			G	Grou Ungr	DE - PF Stem le	ROBE ength,	STEM LENGTI where A is in ir MOTE CONNE losion-proof, sta	CTION HEAD vi andard cast alun	a 3/4" long		ex nipple	
			G	Grou Ungr	DE - PF Stem le	ROBE ength, :- RE Exp	STEM LENGTI where A is in ir MOTE CONNE losion-proof, static (not explosion	CTION HEAD vi andard cast alun	a 3/4" long ninum		ex nipple	
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas	STEM LENGTI where A is in ir MOTE CONNE losion-proof, static (not explosion	cches (3" minimu CTION HEAD vi andard cast alun on-proof) explosion-proof)	a 3/4" long ninum		ex nipple	
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir MOTE CONNE losion-proof, static (not explosion propylene (not) DE - LEAD LEN Minimum lead	CTION HEAD vi andard cast alun on-proof) explosion-proof) IGTH (1) length, as require	a 3/4" long ninum red, 3 - 6 ir	316 SS H		
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir MOTE CONNE losion-proof, static (not explosion propylene (not) DE - LEAD LEN Minimum lead Lead length, a	CTION HEAD vi andard cast alun on-proof) explosion-proof) IGTH (1) length, as requis s specified, grea	a 3/4" long ninum red, 3 - 6 ir	316 SS H		
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir MOTE CONNE losion-proof, static (not explosion propylene (not) DE - LEAD LEN Minimum lead	CTION HEAD vi andard cast alun on-proof) explosion-proof) IGTH (1) length, as requis s specified, grea	a 3/4" long ninum red, 3 - 6 ir	316 SS H		
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir MOTE CONNE losion-proof, static (not explosion propylene (not) DE - LEAD LEN Minimum lead Lead length, a where Y is in	CTION HEAD vi andard cast alun on-proof) explosion-proof) IGTH (1) length, as required s specified, greater in inches	a 3/4" long ninum red, 3 - 6 ir	316 SS H		
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir MOTE CONNE losion-proof, static (not explosion /propylene (not DE - LEAD LEN Minimum lead Lead length, a where Y is in	CTION HEAD vi andard cast alun on-proof) explosion-proof) IGTH (1) length, as requires s specified, great inches	a 3/4" long ninum red, 3 - 6 ir ter than 6	316 SS H	age lengt	
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir MOTE CONNE losion-proof, sta stic (not explosion /propylene (not DE - LEAD LEN Minimum lead Lead length, a where Y is in CODE - OPTIC SST3 Sma	CTION HEAD vi andard cast alun on-proof) explosion-proof) IGTH (1) length, as required s specified, greater in inches	a 3/4" long ninum red, 3 - 6 in ter than 6	316 SS Honorage and the saverage of 10 digits	age lengt	
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir  MOTE CONNE losion-proof, sta stic (not explosion /propylene (not DE - LEAD LEN Minimum lead Lead length, a where Y is in  CODE - OPTIC SST3 Sma SST6 Larg	CTION HEAD vi andard cast alun on-proof) explosion-proof) IGTH (1) length, as requires s specified, great in inches	a 3/4" long ninum red, 3 - 6 in ter than 6 rag (3 lines	316 SS Honores	age lengt	
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir  MOTE CONNE losion-proof, static (not explosion /propylene (not) DE - LEAD LEN Minimum lead Lead length, a where Y is in  CODE - OPTIC SST3 Sma SST6 Larg CCxx Cert	CTION HEAD vi andard cast alun on-proof) explosion-proof) IGTH <sup>(1)</sup> length, as requires s specified, great inches DNS all wired-on SS Toge wi	a 3/4" long ninum  red, 3 - 6 ir ter than 6  rag (3 lines rag (6 lines Calibration	aches averanches of 10 digit of 20 digit (2-point) (2-point)	age lengt	
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir  MOTE CONNE losion-proof, static (not explosion /propylene (not) DE - LEAD LEN Minimum lead Lead length, a where Y is in  CODE - OPTIC SST3 Sma SST6 Larg CCxx Cert CCxx Cert	CTION HEAD vi andard cast alundon-proof) explosion-proof) IGTH (1) length, as requires specified, great inches DNS all wired-on SS Tope wired-on SS Tope wired-on SS Topicate of Probe (1)	a 3/4" long ninum  red, 3 - 6 in ter than 6 ag (3 lines Calibration Calibration	of 10 digit of 20 digit (2-point) (2 (3-point) (2 (3-poin	age lengt	
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir  MOTE CONNE losion-proof, sta stic (not explosion /propylene (not DE - LEAD LEN Minimum lead Lead length, a where Y is in  CODE - OPTIC SST3 Sma SST6 Larg CCxx Cert CCxx Cert CCxx Cert APD Asse	CTION HEAD vi andard cast alundon-proof) explosion-proof) (GTH (1) length, as requires specified, greath inches DNS all wired-on SS Toge wired	a 3/4" long ninum  red, 3 - 6 in ter than 6	of 10 digits of 20 digits (2-point) (2 (3-point) (4-point) (2 (4-point) (2 (4-point) (2 (4-point) (4 (4 (4-point) (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4	age lengt	
			G	Grou Ungr	DE - PF Stem le CODE R PL	ROBE ength, - RE Exp Plas Poly	STEM LENGTI where A is in ir  MOTE CONNE losion-proof, sta stic (not explosion /propylene (not DE - LEAD LEN Minimum lead Lead length, a where Y is in  CODE - OPTIC SST3 Sma SST6 Larg CCxx Cert CCxx Cert CCxx Cert APD Asse	CTION HEAD vi andard cast alundon-proof) explosion-proof) (GTH (1) length, as requires specified, greath inches DNS all wired-on SS Toge wired	a 3/4" long ninum  red, 3 - 6 in ter than 6	of 10 digits of 20 digits (2-point) (2 (3-point) (4-point) (2 (4-point) (2 (4-point) (2 (4-point) (4 (4 (4-point) (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4 (4	age lengt	

- (1) Caution: Excessive lead lengths may result in lead wire damage due to space limitations within the remote head.
- (2) Select Calibration Schedule (xx) from Table 1.(3) Specify LRV, URV and input type of transmitter on OP16-CC screen and select CCxx option.

See Table 2 for Drawings, Manuals and Certificates.

Incone	<b>ATH MA</b> ss Stee	TERIAL						
		ı						
	-							
CODE	TYPE	T/C			Compatible w	STT35x	STT25x	SMV
В						Υ	Υ	-
С						Υ	-	-
D						Y	-	-
E J						Y Y	Y Y	Y Y
K						Ϋ́	Y	Ϋ́
N						Ϋ́	Ϋ́	-
R						Y	Y	-
S						Υ	Υ	-
T						Y	Υ	Υ
					high accuracy T/Cs at	Y	-	-
SP	Otner s	peciai requi	ests ( for	special	high accuracy T/Cs, etc	Y	Y	-
- 1		NUMBER	OF ELEN	<b>MENTS</b>				
		ngle elemer	nt					
	_	al element						
		Organization		ION				
		Grounded Unground						
	١٠				FNOTU			
		CODE -	-		LENGTH Lis in inches (3" minimu	m 24" ma	vim.um) <sup>(4)</sup>	
					G HARDWARE with 1/			s
		A			s 3/4" long standard 31		_	-
					-			
		ВХ	Specif	y straig	ht nipple as "BX"; where	e X = 3", 6'	or 9" leng	ths
			Cnooif	sy doub	la aarban ataal laga and	aluminum	union on "	CV" who
		cx		-	le carbon steel lags and ed lengths of 3", 8", 10"		union as	CX , WITE
			,	· – mai	ed lengths of 5 , 6 , 10	01 14		
		DX	Specif	y doub	le SS lags and SS unior	as "DX", v	where:	
			×	( = mat	ed lengths of 3", 8", 10"	or 14"		
1								
J		(4) No		υ,	us Probe Lag Length exceed	•	riolates FM ap	oproval.
					eting Applications for lengths		//" long 24	6 CC U-
					MOTE CONNECTION F ion-proof, standard cast			u ss me
				•	(not explosion-proof)	alummulli		
				0 0				
			1 50	Polypro	opylene (not explosion-p	roof)		
			_		opylene (not explosion-p	proof)		
			_		opylene (not explosion-p		d. 3 - 6 incl	nes avo
			_	CODE	opylene (not explosion-p	as require	•	Ū
			_	CODE	ppylene (not explosion-p - LEAD LENGTH * Minimum lead length,	as require	•	Ū
			_	CODE	- LEAD LENGTH * Minimum lead length, Lead length, as specif where Y is in inches	as require ied, greate	er than 6 inc	ches
			_	CODE	Depylene (not explosion-popylene (not explosion-popylene (not explosion-popylene)  LEAD LENGTH *  Minimum lead length, Lead length, as specify where Y is in inchest  CODE - OPTIONS SST3 Small wired-options	as require ied, greate s	er than 6 inc	thes 10 digits
			_	CODE	Depylene (not explosion-popylene (not explosion-popylene)  - LEAD LENGTH *  Minimum lead length, Lead length, as specify where Y is in inchestance  CODE - OPTIONS SST3 Small wired-options SST6 Large wired-options	as required ied, greated is son SS Tagon SS Tago	(3 lines of (6 lines of	10 digits 20 digits
			_	CODE	Depylene (not explosion-popylene)  - LEAD LENGTH *  Minimum lead length, Lead length, as specify where Y is in inchestal  CODE - OPTIONS SST3 Small wired-options SST6 Large wired-options CCxx Certificate of	as require ied, greate on SS Tag on SS Tag Probe Cal	(3 lines of (6 lines of ibration (2-	10 digits 20 digits point) (2)
			_	CODE	Depylene (not explosion-popylene (not explosion-popylene)  - LEAD LENGTH *  Minimum lead length, Lead length, as specify where Y is in inchested.  CODE - OPTIONS SST3 Small wired-composite SST6 Large wired-composite CCxx Certificate of CCxx Certi	as require ied, greates on SS Tag on SS Tag Probe Cal Probe Cal	(3 lines of (6 lines of ibration (2- ibration (3-	10 digits 20 digits point) (2)
			_	CODE	Depylene (not explosion-popylene)  - LEAD LENGTH *  Minimum lead length, Lead length, as specify where Y is in inchestal  CODE - OPTIONS SST3 Small wired-options SST6 Large wired-options CCxx Certificate of	as require ied, greates on SS Tag on SS Tag Probe Cal Probe Cal	(3 lines of (6 lines of ibration (2- ibration (3- ibration (4-	10 digits 20 digits point) (2) point) (2) point) (2)

- (1) Caution: Excessive lead lengths may result in lead wire damage due to space limitations within the remote head.
- (2) Select Calibration Schedule (xx) from Table 1.
  (3) Specify LRV, URV and input type of transmitter on OP16-CC screen and select CCxx option.
  See Table 2 for Drawings, Manuals and Certificates.

LX Standard threaded well; with lag extension - stepped HX Heavy duty threaded well; no lag extension - tapered TX Heavy duty threaded well; with lag extension - tapered WX Socket wells - stepped	here X = Well Process Thread/Pipe (extern  1 = mates with 1/2" NPT Pipe (not available with S 2 = mates with 3/4" NPT 3 = mates with 1" NPT  here M = Flange Material
GM Flanged well - tapered  All thermowells have 0.260" bore and 1/2" NPT internal threads to mate with spring-loaded probe.	A = Carbon Steel F = Inconel 600 B = SS 304 G = SS 446 C = SS 316 H = Monel D = SS 316L K = Hastelloy B E = Hastelloy C O = Other
INSERTION (U) LENGTH (IN INCHES) U Insertion (U) length (in inches)  LAG (T) LENGTH (IN INCHES) T Lag (T) length (in inches) For FM, GN  THERMOWELL MATERIAL A Carbon Steel B SS 304 C SS 316 D SS 316L E Hastelloy C F Inconel 600 G SS 446 H Monel K Hastelloy B O Other  FLANGE FACE TYPE R Raised Face F Flat Faced RTJ Ring-Type Joint X Not applicable (choose with SX, L)  FLANGE RATING 150 ANSI 150 Flange Rating 300 ANSI 300 Flange Rating 600 ANSI 400 to ANSI 600 Fl 1500 ANSI 900 to ANSI 1500 I X Not applicable (choose with SX) I FLANGE SIZE (1", 1-1/1" r" Flange size (where read to the state of the state	; Threaded or Socket (A) = U + T + 1.5  M, SX, HX and WX, lag (T) = 0  LX, HX, TX and WX)  lange Rating Flange Rating ith SX, LX, HX, TX and WX)  /2", 2" or 3" flanges available) n is in inches) ose with SX, LX, HX, TX and WX)
CODE - O SST3 S	PTIONS Small wired-on SS Tag (3 lines of 10 digits) arge wired-on SS Tag (6 lines of 20 digits)
FC 6 4 0 C R 150 1" 200 SST3	

See Table 2 for Drawings, Manuals and Certificates.

Note: Do not use rigid probes with thermowells. Only spring-loaded probes are compatible with thermowells.

#### Table 1

#### SENSOR/PROBE CALIBRATION CERTIFICATE SELECTION SCHEDULE

(For use with Probe Calibration Certificate Option CCxx)

When option CCxx is selected with a sensor/probe assembly, a calibration schedule must be selected and indicated with each assembly ordered. Replace xx with the desired calibration schedule.

For example, choose CC5C for 3-point calibration at 0, 100 and 500 degrees C.

xx = Schedule	Available for:	Temperature Range	Actual Calibration Points
1C	3-point	-196 to 0 deg C	-196, 0 & 100 deg C
2C	4-point	-196 to 500 deg C	-196, 0, 100 & 500 deg C
3C	2-point	0 to 100 deg C	0 & 100 deg C
4C	3-point	0 to 200 deg C	0, 100 & 200 deg C
5C	3-point	0 to 500 deg C	0, 100 & 500 deg C
6C	3-point	0 to 660 deg C	0, 100 & 419.58 deg C
XC	2-, 3-, or 4-point \$	Specify (Consult Phoenix FMPM for price	Within the range of -196 to 419.58 deg C
1F	3-point	-320 to 32 deg F	-320, 32 & 212 deg F
2F	4-point	-320 to 932 deg F	-320, 32, 212 & 932 deg F
3F	2-point	32 to 212 deg F	32 & 212 deg F
4F	3-point	32 to 392 deg F	32, 212 & 392 deg F
5F	3-point	32 to 932 deg F	32, 212 & 932 deg F
6F	3-point	32 to 1220 deg F	32, 212 & 787.24 deg F
XF	2-, 3-, or 4-point 8	Specify (Consult Phoenix FMPM for price	(Within the range of -320 to 932 deg F)

#### Table 2

#### Documentation Price List

(For use with any Probe and/or Thermowell Combination Above)

Probe or Thermowell Assembly Drawings	on Sales Order
Reproducible (Specify certified or non-certified)	Order in "Drawings
Blueprint (Specify certified or non-certified)	(DR) text area
Extra Copies	
CAD drawing (on disk) - Specify format.	
(each drawing requested is one file)	
Installation & Maintenance Manuals	
Certificate of Conformance	
Material Traceability Report	
Certificate of Probe Calibration (2-point)	
Certificate of Probe Calibration (3-point)	Order in Probe
Certificate of Probe Calibration (4-point)	Model Number
Assembly Performance Data Certificate	
(Probe with STT 3000)	

- Required documentation must be specified at the time of order.
- Standard leadtime is 5 days for quantities less than 10.

#### - For Drawings, on Sales Order,

- Specify quantity, name/"Attn. to", address where drawings are to be shipped to, and whether reproducible (specify certified or non-certified), blueprint (specify certified or non-certified), copy or CAD drawings in "Drawings" (DR) text area.
- Additional/Alternate addresses should be included in the standard Ship SPINS (SP).
   If address is not provided, drawings will be shipped along with the unit to the Ship To address listed on the sales order.
- For Drawings on Disk,
  - Specify drawing format in "Drawings" (DR) text area. Available formats are:
  - \*.dwg AutoCad (Specify R12 or R13), \*.3ds, \*.bmp, \*.dxf, \*.dxx, \*.eps, \*.pft, \*.sat and \*.wmf.

#### Table 3

#### Assembly Performance Data Certificate

(For use with any Probe and/or Thermowell Combination Above)

#### **Assembly Performance Data Certificate Option**

Based on the options previously selected for each individual sensor/probe assembly, the Assembly Performance Data Certificate (APDC) will be generated. Select CCxx option (See Table 1).

· Individual data obtained with CCxx will be used in simulated inputs to the transmitter to generate

