



# APPLIED SENSOR TECHNOLOGIES

A Division of UNITED ELECTRIC CONTROLS

**INSTRUMENTS • CONTROLS • VALVES**



**Engineering, Inc.**

SINCE 1954

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## PRODUCTS:

- Thermocouples
- RTDs
- Thermowell & Protection Tubes
- Sensor Box™
- Transmitters
- Accessories

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## **CONNECTION HEAD WITH WELDED NPT PROCESS CONNECTION**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

#### **SENSOR TYPE**

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**15 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel**

**process connection;** head conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; gasketed screw cover with stainless steel chain (Note: for spring-loaded assembly, see Style 75 and add optional head)

#### **SHEATH DIAMETER** (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

**5** – Inconel® 600

#### **CALIBRATION** – Standard limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

*Special limits are available – consult AST*

#### **HOT JUNCTION**

**G** – Grounded junction

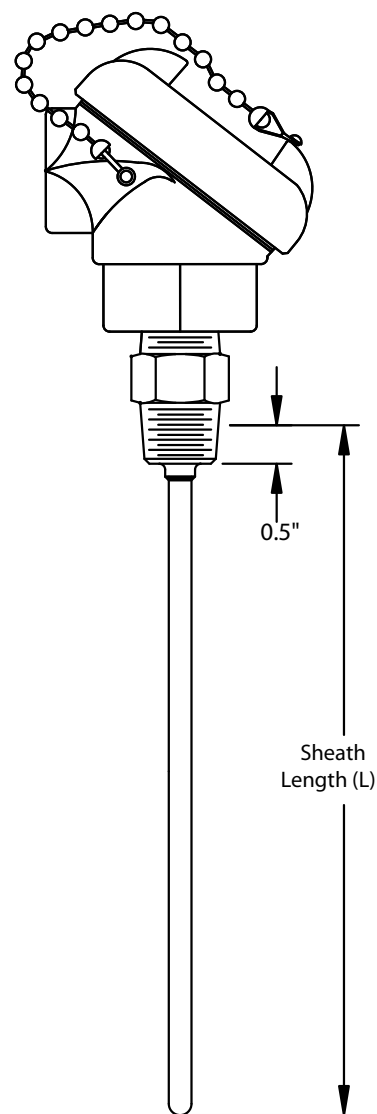
**U** – Ungrounded junction

**E** – Exposed junction

**SHEATH LENGTH** (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

**L#** – (e.g., L6 = 6" sheath, L12.5 = 12.5" length)

**OPTIONS** – see page 1-1b



## STYLE 15

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
PC25	1/4" NPT process connection
PC75	3/4" NPT process connection
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
TRANSMITTERS – For complete specs, see Transmitters section	
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			

#### Notes:

1. See Accessories for additional information.
2. For former Style 60, use option HD20.
3. For former Style 29, use option HD32.

## CONNECTION HEAD WITH SPRING-LOADED ASSEMBLY AND MOUNTING HARDWARE

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

#### SENSOR TYPE

**MI** – Mineral insulated thermocouple

#### ASSEMBLY STYLE

**45 – Sheath with cast aluminum head;** spring-loaded in head; head conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT carbon steel process connection; gasketed screw cover with stainless steel chain; maximum head temperature 100°C

#### CONNECTION

**H** – Head only, no mounting hardware; 1/2" NPT (female) instrument connection

**N** – 1/2" NPT carbon steel nipple

**NU** – 1/2" NPT carbon steel nipple and union

**NUN** – 1/2" NPT carbon steel nipple, union and nipple

Add suffix **"1S"** for 304 stainless steel

Add suffix **"2S"** for 316 stainless steel

See chart below for restrictions

#### CONNECTION LENGTH

**###** (e.g., 006 = 6 inch)

(See chart below for standard available lengths)

#### SHEATH DIAMETER (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### SHEATH MATERIAL

**3** – 316 stainless steel

#### CALIBRATION – Standard limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

*Special limits are available – consult AST*

#### HOT JUNCTION

**G** – Grounded junction

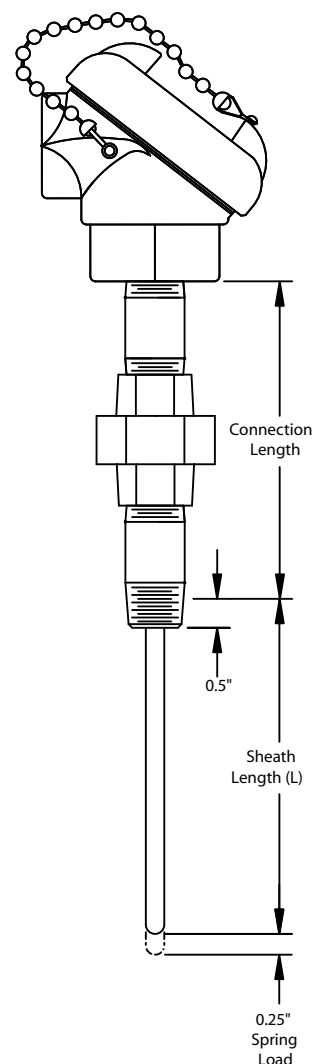
**U** – Ungrounded junction

#### SHEATH LENGTH (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

#### OPTIONS – see page 1-2b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00 *
1.00	3.00	4.00 *
1.50	3.50	5.00
2.00	4.00	6.00 *
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
* NUN 2S OPTION AVAILABLE IN THESE LENGTHS ONLY.		
DIMENSIONS ARE GIVEN IN INCHES		



## STYLE 45

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
Transmitters: see Style 48	

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10	HD11	1/2"	1/2"
Std.	HD13	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50	HD51	1/2"	1/2"
HD52	HD53	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20	HD21	1/2"	1/2"
HD22	HD23	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40	HD41	1/2"	3/4"

#### Notes:

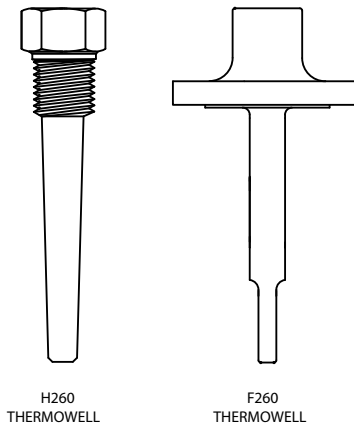
1. See Accessories for additional information
2. For former Style 46, use option HD20

#### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

#### THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.



## EXPLOSION-PROOF CONNECTION HEAD WITH WELDED NPT PROCESS CONNECTION

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

#### SENSOR TYPE

**MI** – Mineral insulated thermocouple

#### ASSEMBLY STYLE

**78 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection;** head CSA/FM approved for Class I, Division 1, Groups B, C, D; Class II, Groups E, F, G; screw cover with chain and gasketed o-ring, meets NEMA 4; ceramic terminal block; 1/2" NPT conduit connection (Note: for spring-loaded fitting, see Style 75 and add optional head).

#### SHEATH DIAMETER (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### SHEATH MATERIAL

**3** - 316 stainless steel

**5** - Inconel® 600

#### CALIBRATION – Standard limits

**J** – Single J      **JJ** – Dual J

**K** – Single K      **KK** – Dual K

**T** – Single T      **TT** – Dual T

**E** – Single E      **EE** – Dual E

*Special limits are available – consult AST*

#### HOT JUNCTION

**G** – Grounded junction

**U** – Ungrounded junction

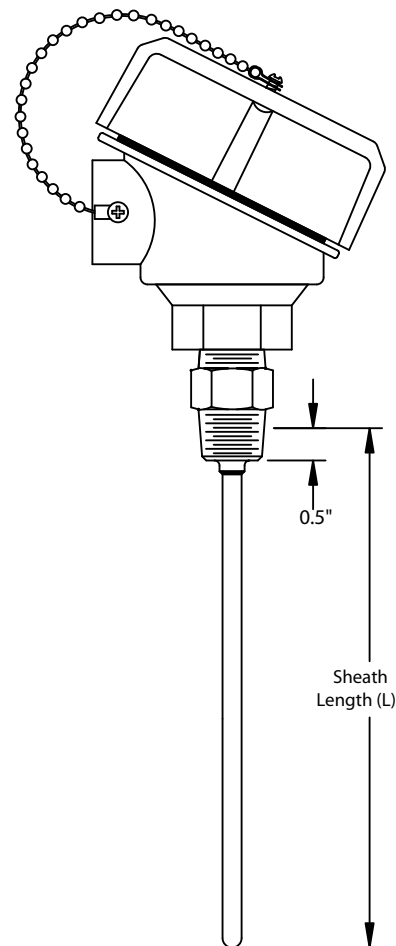
**E** – Exposed junction

(Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

#### SHEATH LENGTH

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

**OPTIONS** – see page 1-3b



## STYLE 78

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
PC25	1/4" NPT process connection
PC75	3/4" NPT process connection
CAL1	Calibration, NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
<b>TRANSMITTERS</b> – For complete specs, see Transmitters section	
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C)
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.

EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum; screw cover with chain; o-ring gasket (Gasket rated to 100°C exposure); ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C and D; Class II Groups E, F and G; internal ground screw.		
HD71	1/2"	3/4"
Epoxy-coated, same specs as HD71		
HD80	1/2"	1/2"
HD81	1/2"	3/4"

Note: See Accessories section for additional specs.



## **EXPLOSION-PROOF CONNECTION HEAD WITH SPRING-LOADED ASSEMBLY AND MOUNTING HARDWARE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

#### **SENSOR TYPE**

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**77 – Sheath with cast aluminum head;** spring-loaded in head; CSA/FM approved head for Class I, Division 1, Groups B, C, D; Class II, Groups E, F, G; screw cover with chain and gasketed o-ring; designed for NEMA 4; ceramic terminal block; 1/2" NPT conduit and process connections.

#### **CONNECTION**

**H** – Head only, no mounting hardware; 1/2" NPT (female) instrument connection

**N** – 1/2" NPT carbon steel nipple

**NU** – 1/2" NPT carbon steel nipple and plated steel explosion-proof union

**NUN** – 1/2" NPT carbon steel nipples and plated steel explosion-proof union

Add suffix **"1S"** for 304 stainless steel nipples

#### **CONNECTION LENGTH**

**###** (e.g., 006 = 6 inch)

(See chart below for standard available lengths)

#### **SHEATH DIAMETER**

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

#### **CALIBRATION** - Standard limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

*Special limits are available – consult AST*

#### **HOT JUNCTION**

**G** – Grounded junction

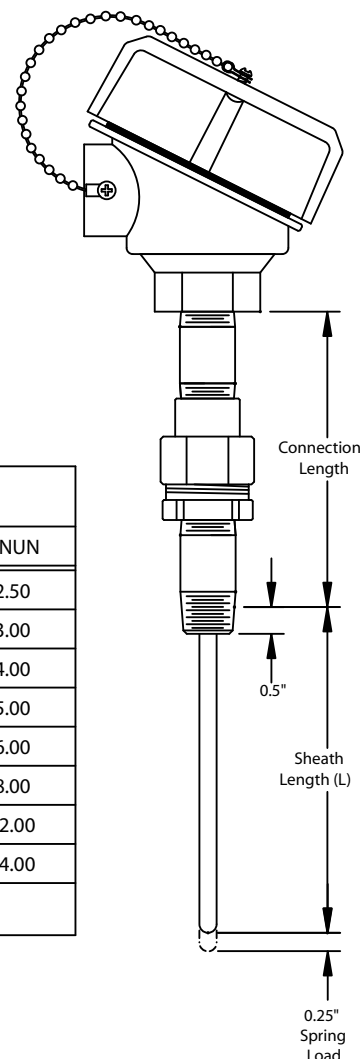
**U** – Ungrounded junction

**SHEATH LENGTH:** (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

**L#** - (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

**OPTIONS** – see page 1-4b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00
1.00	3.00	4.00
1.50	3.50	5.00
2.00	4.00	6.00
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
DIMENSIONS ARE GIVEN IN INCHES		



## STYLE 77

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Codes	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
TRANSMITTERS	
See Style 48 for available transmitters	

EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum; screw cover with chain; o-ring gasket; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C and D; Class II Groups E, F and G (Gasket rated to 100°C exposure); internal ground screw		
HD71	1/2"	3/4"
Same as above, except epoxy-coated		
HD80	1/2"	1/2"
HD81	1/2"	3/4"

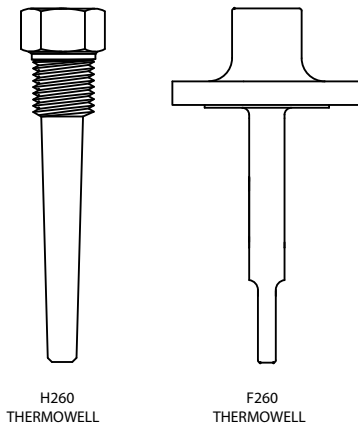
Note: See Accessories section for outline drawings and additional specs.

### THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.



## **DOUBLE-SIDED, SPRING-LOADED PROCESS MOUNTING WITH TERMINAL HEAD OPTIONS**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTION

#### **SENSOR TYPE**

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**75** – Sheath with double-sided, spring-loaded fitting; Teflon® insulated conductors; 1/2" NPT stainless steel connection. (Note: a variety of terminal heads may be added to this style – see page 1-5b)

#### **SHEATH DIAMETER** (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

**5** – Inconel® 600

#### **CALIBRATION** Standard limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

*Special limits are available – consult AST*

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

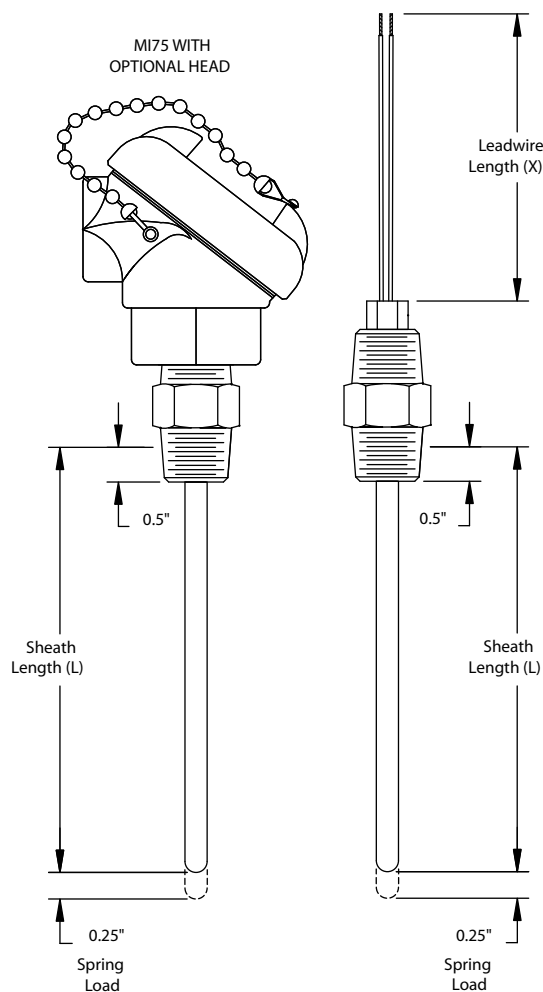
**SHEATH LENGTH** (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12-1/2" length)

#### **LEADWIRE LENGTH**

**X#** - (e.g., X3 = 3 inch length; X3 is standard if specifying a terminal head)

**OPTIONS** – see page 1-5b



## STYLE 75

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
TRANSMITTERS	
TR11	4-20 mA, 2-wire; single input; isolated output; specify range, units of measure (e.g., 0-200°C) and terminal head with *. See Accessories section for additional information.
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.

#### THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
HD12 *	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52 *	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22 *	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection		Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"		1/2"
HD71 *	1/2"		3/4"
Epoxy-coated (same spec as H6/H7)			
HD80*	1/2"		1/2"
HD81 *	1/2"		3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72 *	1/2"		1/2"
HD73 *	1/2"		3/4"
Cast aluminum (Formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"		1/2"
HD61	1/2"		3/4"
*can be used with transmitters			

## SPRING-LOADED PROCESS MOUNTING HARDWARE WITH OPTIONAL TERMINAL HEAD

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION TYPE AND MATERIAL	CONN. LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

#### SENSOR TYPE

**MI** – Mineral insulated thermocouple

#### ASSEMBLY STYLE

**48** – Sheath with spring-loaded hex connector and connection hardware; head as option

#### CONNECTION TYPE AND MATERIAL

Code	Union Type	Union Material	Lower Nipple Material
<b>NU</b>	Ordinary location	Carbon steel	None
<b>NUS</b>	Ordinary location	Stainless steel	None
<b>NUX</b>	Explosion-proof	Electroplated steel	None
<b>NUN</b>	Ordinary location	Carbon steel	Carbon steel
<b>NUNS</b>	Ordinary location	Stainless steel	Stainless steel
<b>NUNX</b>	Explosion-proof	Electroplated steel	Carbon steel
<b>NUNXS</b>	Explosion-proof	Electroplated steel	Stainless steel

#### CONNECTION LENGTH (For NU, NUX, NUS, use 002.5)

**###** (e.g., 006 = 6 inch)

(See chart for available standard lengths)

#### SHEATH DIAMETER (in inches)

**4** – 1/8" (0.125)

**6** – 3/16" (0.188)

**7** – 1/4" (0.250)

**9** – 3/8" (0.375)

#### SHEATH MATERIAL

**3** – 316 stainless steel

**5** – Inconel® 600

#### CALIBRATION – Standard limits

**J** – Single J      **JJ** – Dual J

**K** – Single K      **KK** – Dual K

**T** – Single T      **TT** – Dual T

**E** – Single E      **EE** – Dual E

*Special limits are available – consult AST*

#### HOT JUNCTION

**G** – Grounded junction

**U** – Ungrounded junction

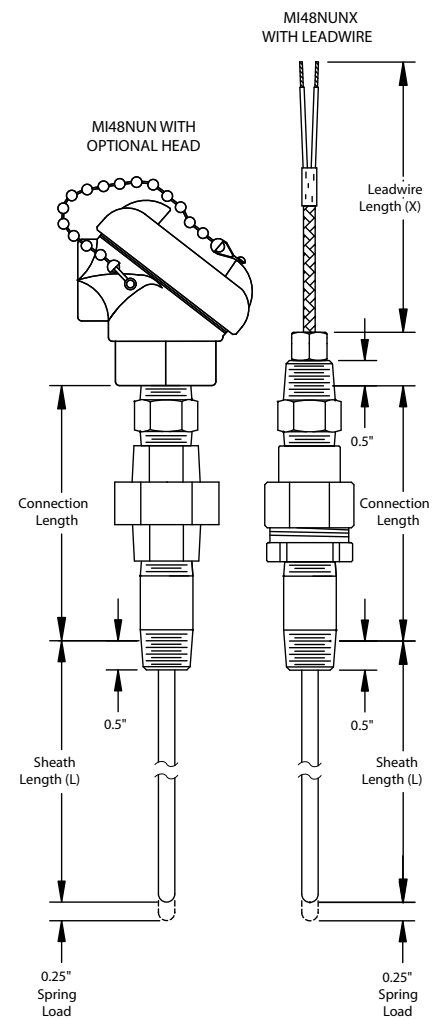
#### SHEATH LENGTH (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

#### LEADWIRE LENGTH

**X#** – (e.g., X3 = 3 inch length; X3 is standard if specifying optional head)

**OPTIONS** – see page 1-6b



STANDARD AVAILABLE CONNECTION LENGTHS FOR NUN CONNECTIONS
3.00
3.50
4.00
4.50
5.00
6.00
8.00
DIMENSIONS ARE GIVEN IN INCHES

**AVAILABLE OPTIONS and MODIFICATIONS**

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
TRANSMITTERS - for complete specs, see Transmitters section	
TR11	4-20 mA, 2-wire; single input; isolated output; specify range, units of measure (e.g., 0-200°C) and terminal head with *. See Accessories section for additional information.
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.

**THERMOWELLS & PROTECTION TUBES**

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
HD12*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection		Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"		1/2"
HD71 *	1/2"		3/4"
Epoxy-coated (same specs as H6/H7)			
HD80*	1/2"		1/2"
HD81 *	1/2"		3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72*	1/2"		1/2"
HD73 *	1/2"		3/4"
Cast aluminum (Formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"		1/2"
HD61	1/2"		3/4"
*can be used with transmitters			

## **CONNECTION HEAD WITH WELDED HEX FITTING**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

#### **SENSOR TYPE**

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**21 – Sheath with cast aluminum head and welded stainless steel connection;** for use as ambient sensor or with compression fitting for process mounting; head conforms to NEMA 4 requirements; 3/4" conduit connection; ceramic terminal block; gasketed screw cover with stainless steel chain. See page 1-7b for other head options.

#### **SHEATH DIAMETER** (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

**5** – Inconel® 600

#### **CALIBRATION** – Standard Limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

*Special limits are available – consult AST*

#### **HOT JUNCTION**

**G** – Grounded junction

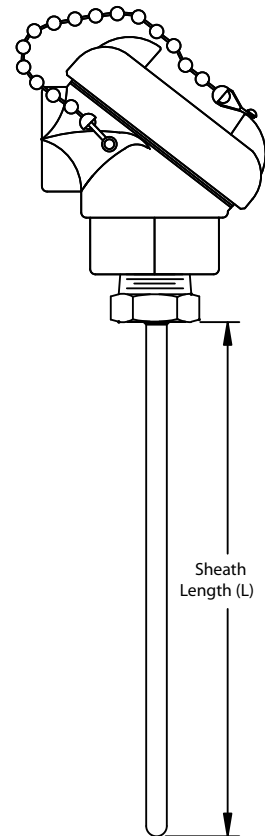
**U** – Ungrounded junction

**E** – Exposed junction

#### **SHEATH LENGTH** (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

**L#** – (e.g., L6 = 6" sheath, L12.5 = 12.5" length)

**OPTIONS** – see page 1-7b



Style 21

## STYLE 21

ASSEMBLY OPTIONS			
Option Code	Description		
TAG1	Stainless steel tag and wire		
B90-	90° bend in sheath [specify length from tip in inches e.g., B90-6]		
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)		
CAL1	NIST traceable calibration [specify point(s)]		
CRT1	Certificate of conformance		
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections		
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections		
COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
TRANSMITTERS - for complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional head with *. See Accessories section for additional information.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
WELD PADS			
Option Code	Radius To Fit Pipe		
WP00	Horizontal pad/flat		
WP10	1" nominal pipe size		
WP15	1.5" nominal pipe size		
WP20	2" nominal pipe size		
WP25	2.5" nominal pipe size		
WP30	3" nominal pipe size		
WP35	3.5" nominal pipe size		
WP40	4" nominal pipe size		

## AVAILABLE OPTIONS and MODIFICATIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain			
HD10*	HD11 *	1/2"	1/2"
Std. *	HD13 *	1/2"	3/4"
Epoxy-coated, cast aluminum, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain			
HD20*	HD21 *	1/2"	1/2"
HD22 *	HD23 *	1/2"	3/4"
316 stainless steel, screw cover; NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
Polypropylene, white, screw cover			
HD30	N/A	1/2"	3/4"
Polypropylene, black screw cover			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection	Conduit Connection	
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"	1/2"	
HD71 *	1/2"	3/4"	
Epoxy-coated			
HD80*	1/2"	1/2"	
HD81 *	1/2"	3/4"	
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72 *	1/2"	1/2"	
HD73 *	1/2"	3/4"	
Cast aluminum (Formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"	1/2"	
HD61	1/2"	3/4"	
*can be used with transmitters			

Note: See Accessories section for outline drawings and additional specs.



## NOBLE METAL THERMOCOUPLE WITH TERMINAL HEAD AND PROTECTION TUBE

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	STYLE	PROTECTION TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	PRIMARY TUBE LENGTH	OPTIONS

#### SENSOR TYPE

**BTC** – Beaded construction

#### STYLE

**81N** – Noble metal element with primary protection tube only; threaded connection between head and tube; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

#### PROTECTION TUBE CONFIGURATION

(e.g., **00A6** = 3/8" O.D. tube with 6" nipple and 1/2" NPT connection. See page 1-8b for available combinations of OD and thread size)

Protection tube diameter

- 0** – 3/8" O.D.
- 1** – 1/2" O.D.
- 2** – 11/16" O.D.
- 3** – 3/4" O.D.

Process thread size and material

- |                     |                            |
|---------------------|----------------------------|
| <i>Carbon Steel</i> | <i>316 stainless steel</i> |
| <b>0</b> – 1/2" NPT | <b>3</b> – 1/2" NPT        |
| <b>1</b> – 3/4" NPT | <b>4</b> – 3/4" NPT        |
| <b>2</b> – 1" NPT   | <b>5</b> – 1" NPT          |

Protection tube material

- A** – Alumina (98.8% aluminum oxide)
- M** – Mullite (not recommended over 1200°C)

Connection Length ("CL")

- 1** – hex fitting only
- #** – length of nipple

#### CALIBRATION

##### Single junction

- R** – Platinum and Platinum/13% Rhodium
- S** – Platinum and Platinum/10% Rhodium
- B** – Platinum/6% Rhodium and Platinum/30% Rhodium

##### Dual junctions

- RR**
- SS**
- BB**

#### WIRE GAUGE

**24** – 24 AWG

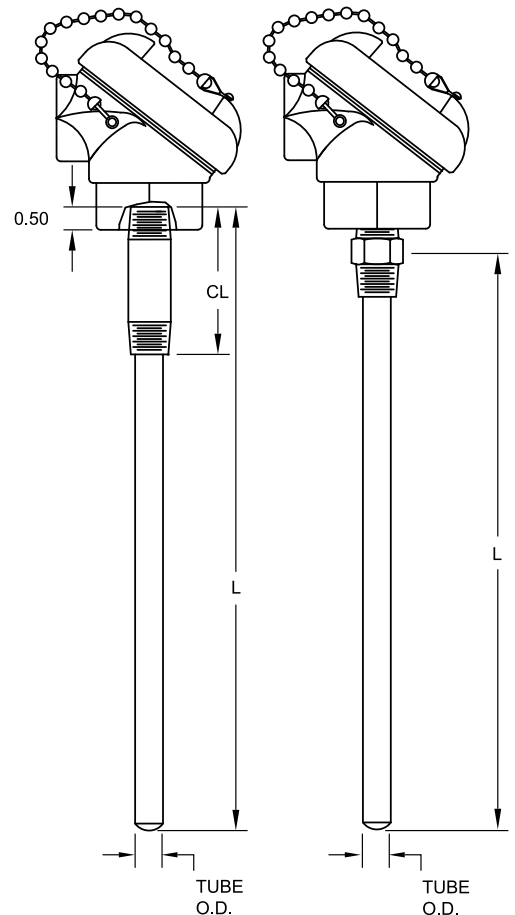
#### BEAD MATERIAL

**A** – Alumina beads (0.125" OD for single junction, 0.188" for dual)

#### PROTECTION TUBE LENGTH

**L#** – (e.g., L12 = 12" protection tube length)

**OPTIONS** – see page 1-8b



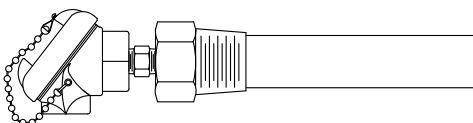
# STYLE 81N

## TERMINAL HEAD OPTIONS

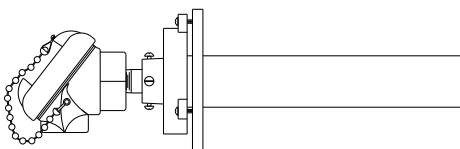
ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections

For additional Noble Metal Thermocouple styles, see:

**Style 81B** – Secondary tube with mounting bushing



**Style 81F** – Secondary tube with slip flange mounting



**Style 51** – Replacement Sensor



### Notes:

- Not all materials and process thread sizes are compatible with all tubing O.D.'s. Use the chart below as a guide for the possible combinations.

### TUBE O.D.

### PROCESS THREAD (NPT)

CODE	Carbon steel			316 Stainless		
	0 (1/2")	1 (3/4")	2 (1")	3 (1/2")	4 (3/4")	5 (1")
0 (3/8")	Yes			Yes		
1 (1/2")	Yes	Yes		Yes	Yes	
2 (11/16")		Yes			Yes	
3 (3/4")		Yes	Yes		Yes	Yes

- Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.
- In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact Applied Sensor Technologies for further information.
- Applied Sensor Technologies offers many other temperatures sensor designs and technologies, including base metal thermocouples, RTDs, thermistors and Integrated Circuit chips, along with a full line of accessory items such as thermowells, transmitters, etc. Please visit our website or contact us for further information.

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11*	1/2"	1/2"
Std.*	HD13*	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51*	1/2"	1/2"
HD52*	HD53*	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21*	1/2"	1/2"
HD22*	HD23*	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41*	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			
<b>TRANSMITTERS</b> – For complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		

## NOBLE METAL THERMOCOUPLE WITH SECONDARY PROTECTION TUBE & BUSHING

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	STYLE	SECONDARY TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	SECONDARY TUBE LENGTH	OPTIONS

#### SENSOR TYPE

**BTC** – Beaded construction

#### STYLE

**81B** – Noble metal element with inner and outer protection tubes; threaded bushing process attachment; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

#### SECONDARY TUBE CONFIGURATION

(e.g., **9C5A** = 1.75" O.D. silicon carbide protection tube with 2" NPT carbon steel bushing. See page 1-9b for available combinations of materials and sizes)

##### Outer protection tube diameter

<b>3</b> – 3/4" O.D.	<b>7</b> – 1-1/4" O.D.
<b>4</b> – 7/8" O.D.	<b>8</b> – 1-1/2" O.D.
<b>5</b> – 1" O.D.	<b>9</b> – 1-3/4" O.D.
<b>6</b> – 1-1/10" O.D.	

##### Outer protection tube material

<b>C</b> – Silicon Carbide, oxide bonded*	<b>H</b> – Hexalloy®
<b>S</b> – Sialon®	<b>L</b> – LT1

\* Other grades of silicon carbide available upon request. Consult AST.

##### Bushing thread and material

<i>Carbon Steel</i>	<i>316 Stainless steel</i>
<b>2</b> – 1" NPT	<b>6</b> – 1" NPT
<b>3</b> – 1-1/4" NPT	<b>7</b> – 1-1/4" NPT
<b>4</b> – 1-1/2" NPT	<b>8</b> – 1-1/2" NPT
<b>5</b> – 2" NPT	<b>9</b> – 2" NPT

##### Inner protection tube material

<b>A</b> – Alumina (98.8% aluminum oxide)
<b>M</b> – Mullite (not recommended over 1200°C)

#### CALIBRATION

##### Single junction

**R** – Platinum and Platinum/13% Rhodium  
**S** – Platinum and Platinum/10% Rhodium  
**B** – Platinum/6% Rhodium and Platinum/30% Rhodium

##### Dual junctions

**RR**  
**SS**  
**BB**

#### WIRE GAUGE

**24** – 24 AWG

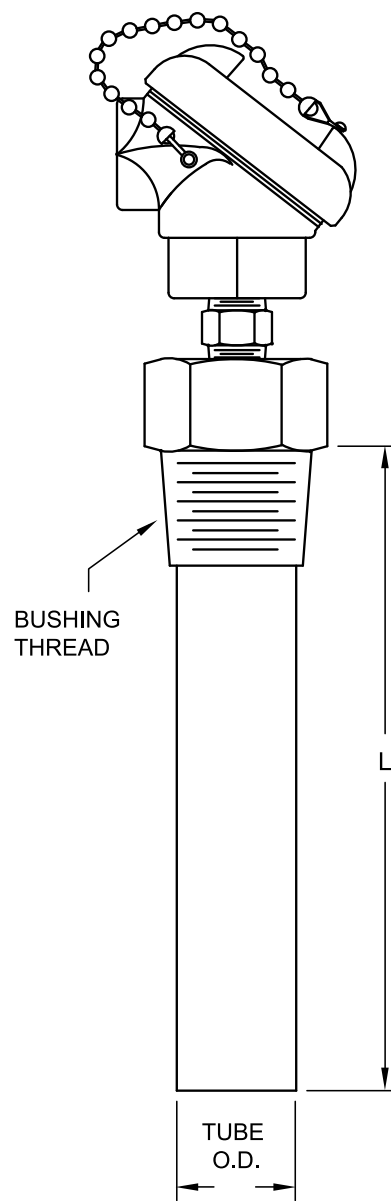
#### BEAD MATERIAL

**A** – Alumina beads (0.125" OD for single junction, 0.188" for dual)

#### SECONDARY TUBE LENGTH

**L#** – (e.g., L12 = 12" outer protection tube length)

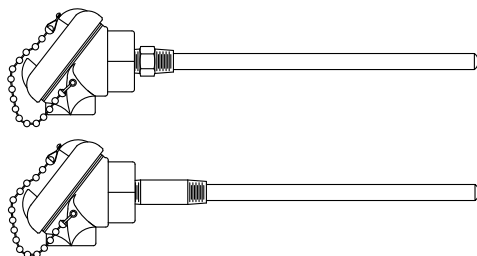
**OPTIONS** – see page 1-9b



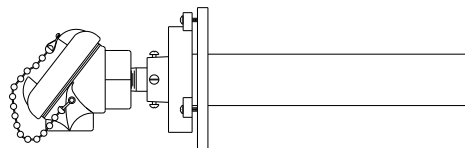
ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections

For additional Noble Metal Thermocouple styles, see:

**Style 81N** – Single, primary protection tube only



**Style 81F** – Secondary tube with slip flange mounting



**Style 51** – Replacement Sensor



#### Notes:

1. Not all materials and process thread sizes are compatible with all tubing O.D.'s. Use the chart below as a guide for the possible combinations. For each combination of thread and O.D., available materials are noted - Silicon Carbide (C), Sialon® (S), Hexalloy® (H) and LT1 (L).

OUTER TUBE O.D.	CODE	CARBON STEEL				316 STAINLESS			
		2 (1")	3 (1-1/4")	4 (1-1/2")	5 (2")	6 (1")	7 (1-1/4")	8 (1-1/2")	9 (2")
	<b>3 (3/4")</b>	H	H	H	H	H	H	H	H
	<b>4 (7/8")</b>	L,S	L,S	L,S	L,S	L,S	L,S	L,S	L,S
	<b>5 (1")</b>		H	H	H		H	H	H
	<b>6 (1-1/10")</b>		S	S	S		S	S	S
	<b>7 (1-1/4")</b>			H	H			H	H
	<b>8 (1-1/2")</b>			H	H			H	H
	<b>9 (1-3/4")</b>				C				C

- Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.
- In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact Applied Sensor Technologies for further information.
- Applied Sensor Technologies offers many other temperatures sensor designs and technologies, including base metal thermocouples, RTDs, thermistors and Integrated Circuit chips, along with a full line of accessory items such as thermowells, transmitters, etc. Please visit our website or contact us for further information.

## STYLE 81B

### TERMINAL HEAD OPTIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11*	1/2"	1/2"
Std.*	HD13*	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51*	1/2"	1/2"
HD52*	HD53*	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21*	1/2"	1/2"
HD22*	HD23*	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41*	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			
<b>TRANSMITTERS</b> – For complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		

### PROCESS THREAD (NPT)

**Note:** Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.

## **NOBLE METAL THERMOCOUPLE WITH SECONDARY PROTECTION TUBE & MOUNTING FLANGE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	STYLE	PROTECTION TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	OUTER PROTECTION TUBE LENGTH	OPTIONS

#### **SENSOR TYPE**

**BTC** – Beaded construction

#### **STYLE**

**81F** – Noble metal element with primary and secondary protection tubes; mounting flange process attachment; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

#### **PROTECTION TUBE CONFIGURATION**

(e.g., **9C5A** = 1.75" O.D. silicon carbide protection tube with 4-7/8" mounting flange and alumina inner protection tube)

Outer protection tube diameter

**9** - 1-3/4" O.D.

Outer protection tube material

**C** - Silicon carbide, oxide bonded\*

\* Other grades of silicon carbide available upon request. Consult AST.

Flange size

**5** - 4-7/8" O.D.

Inner protection tube material

**A** – Alumina (98.8% aluminum oxide)

**M** – Mullite (not recommended over 1200°C)

#### **CALIBRATION**

##### **Single junction**

**R** – Platinum and Platinum/13% Rhodium

**S** – Platinum and Platinum/10% Rhodium

**B** – Platinum/6% Rhodium and Platinum/30% Rhodium

##### **Dual junctions**

**RR**

**SS**

**BB**

#### **WIRE GAUGE**

**24** – 24 AWG

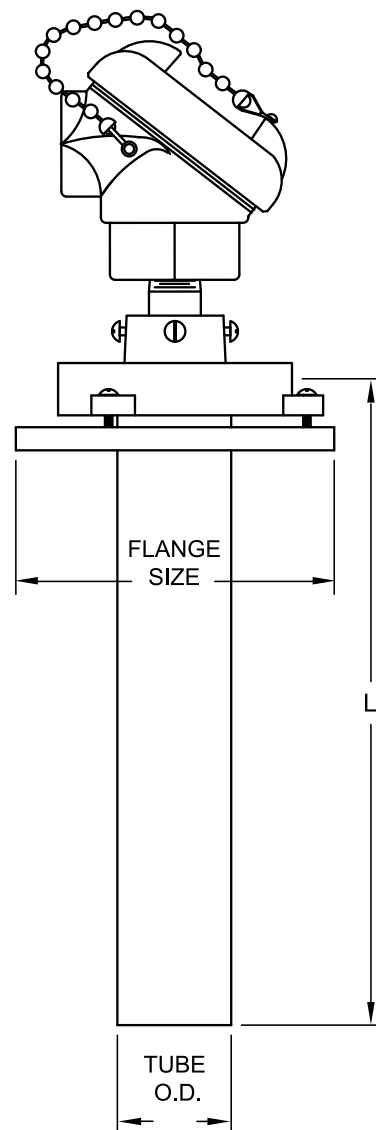
#### **BEAD MATERIAL**

**A** – Alumina beads (0.125" OD for single junction, 0.188" for dual)

#### **OUTER PROTECTION TUBE LENGTH**

**L#** – (e.g., L12 = 12" outer protection tube length)

**OPTIONS** – see page 1-10b



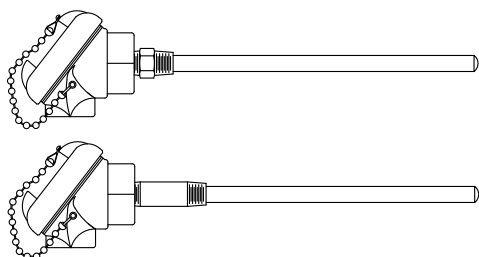
## STYLE 81F

### TERMINAL HEAD OPTIONS

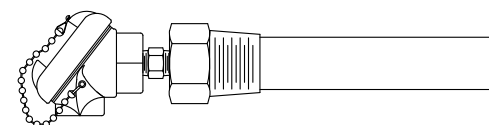
ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections

For additional Noble Metal Thermocouple styles, see:

**Style 81N** – Single, primary protection tube only



**Style 81B** – Secondary tube with mounting bushing



**Style 51** – Replacement Sensor



NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53*	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
* can be used with transmitters			
<b>TRANSMITTERS</b> – For complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		

#### Notes:

1. Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.
2. In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact Applied Sensor Technologies for further information.
3. Applied Sensor Technologies offers many other temperatures sensor designs and technologies, including base metal thermocouples, RTDs, thermistors and Integrated Circuit chips, along with a full line of accessory items such as thermowells, transmitters, etc. Please visit our website or contact us for further information.

## **SHEATH WITH LEADWIRE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

#### **SENSOR TYPE\***

**GP** – General purpose thermocouple

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**02 – Sheath with leadwire;** fiberglass insulated conductors; fiberglass jacket

**04 – Sheath with leadwire;** fiberglass insulated conductors; fiberglass jacket; stainless steel overbraid overall

**28 – Sheath with Teflon® insulated conductors;** Teflon® jacketed cable

#### **SHEATH DIAMETER** (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

**5** – Inconel® 600 (MI only)

#### **CALIBRATION** - Standard limits

**J** – Single J      **JJ** – Dual J

**K** – Single K      **KK** – Dual K

**T** – Single T      **TT** – Dual T

**E** – Single E      **EE** – Dual E

*Special limits are available – consult AST*

*Dual junction not available with all GP Thermocouples in sheath diameter 4 and GP04 diameter 6*

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

**E** – Exposed junction

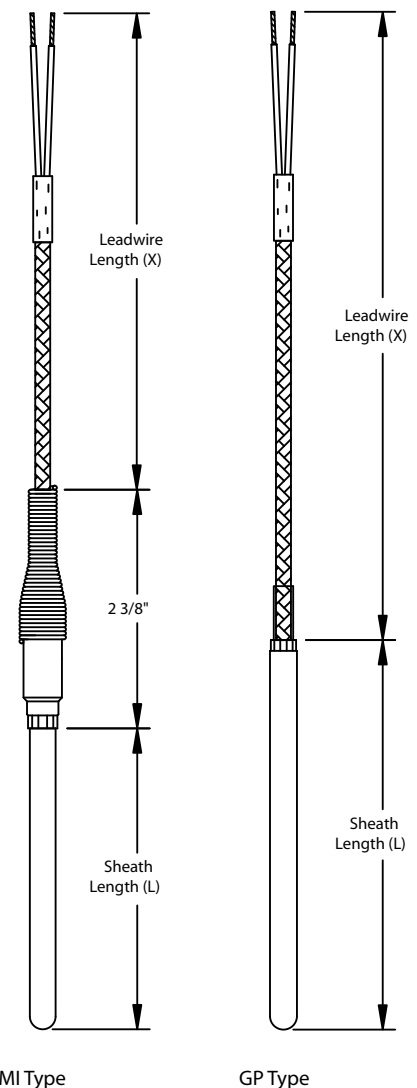
**SHEATH LENGTH** (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

#### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 1-11b



\*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.

## STYLES 02, 04, 28

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
HT10	High temperature (900°F) transition. (Standard transition on Styles 02 and 04 is 500°F/260°C)

WIRING CONNECTION OPTIONS			
WC76	#6 spade terminals, plated copper		
WC70	#10 spade terminals, plated copper		
WC84	1/4" push-on insulated terminals, plated copper		
WC90	#10 ring terminals		
WC98	#8 ring terminals		
For plugs and jacks, see Styles 05, 07, 69.			
COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
WELD PADS			
WP00	Horizontal pad/flat		
WP10	1" nominal pipe size		
WP15	1.5" nominal pipe size		
WP20	2" nominal pipe size		
WP25	2.5" nominal pipe size		
WP30	3" nominal pipe size		
WP35	3.5" nominal pipe size		
WP40	4" nominal pipe size		

### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.



## **SHEATH WITH LEADWIRE AND ARMOR**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	ARMOR CABLE LENGTH	OPTIONS

#### **SENSOR TYPE\***

**GP** – General purpose thermocouple

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**03** – Sheath with leadwire and flexible stainless steel armor cable; fiberglass-insulated conductors; fiberglass jacket.

**03P** – PVC-coated armor

**03T** – Teflon® coated armor

#### **SHEATH DIAMETER** (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

**5** – Inconel® 600 (MI only)

#### **CALIBRATION** Standard limits

**J** – Single J      **JJ** – Dual J

**K** – Single K      **KK** – Dual K

**T** – Single T      **TT** – Dual T

**E** – Single E      **EE** – Dual E

*Special limits are available – consult AST*

*Dual junction not available with GP thermocouples in sheath diameter 4*

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

**E** – Exposed junction

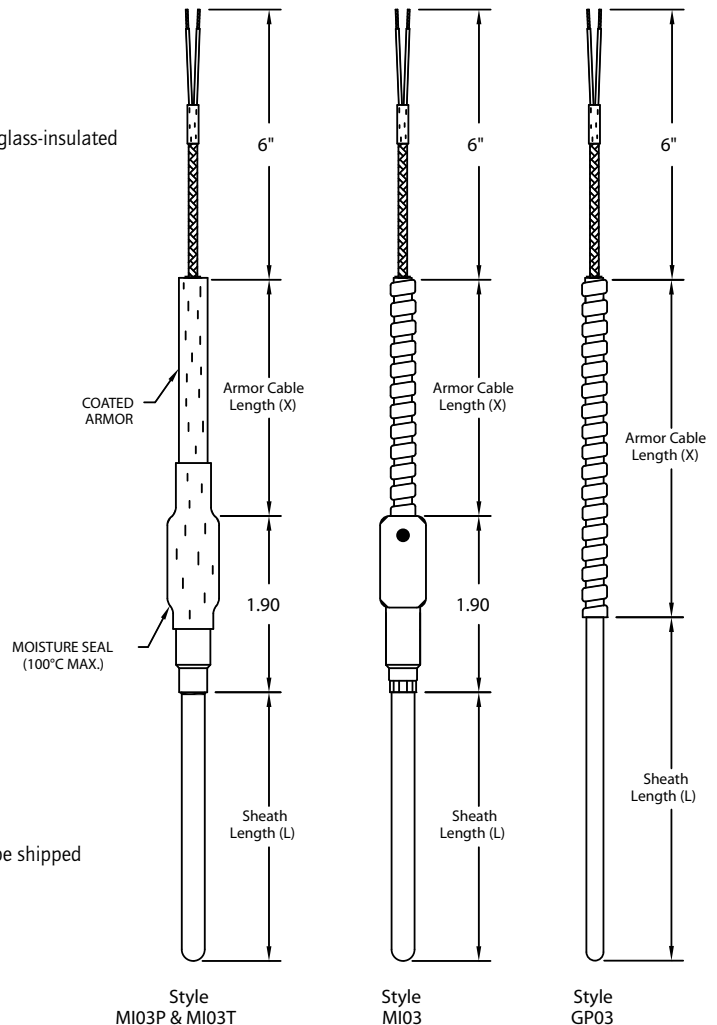
**SHEATH LENGTH** (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

#### **ARMOR CABLE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 1-12b



\*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.

## STYLE 03

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS			
Option Code	Description		
TAG1	Stainless steel tag and wire		
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)		
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)		
CAL1	NIST traceable calibration [specify point(s)]		
CRT1	Certificate of conformance		
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)		
COMPRESSION FITTINGS			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
LEADWIRE AND ARMOR OPTIONS			
BA50	Bayonet cap on armor, no spring ( <b>formerly Style 25</b> )		
Note: For assembly with sheath, armor and terminal head, see Style 66.			

WIRING CONNECTION OPTIONS	
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. plug, rated to 260°C (500°F)
PJ60	High temp. jack, rated to 260°C (500°F)
BX CONNECTORS	
WC40	1/2"
WC50	3/4"
WELD PADS	
WP00	Horizontal pad/flat
WP10	1" nominal pipe size
WP15	1.5" nominal pipe size
WP20	2" nominal pipe size
WP25	2.5" nominal pipe size
WP30	3" nominal pipe size
WP35	3.5" nominal pipe size

#### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

## **SHEATH WITH LEADWIRE AND PLUG**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

#### **SENSOR TYPE\***

**GP** – General purpose thermocouple

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**05 – Sheath with leadwire; standard male plug;** fiberglass insulated conductors; fiberglass jacket

**07 – Sheath with leadwire; stainless steel overbraid; standard male plug;** fiberglass insulated conductors; fiberglass jacket

**69 – Sheath with leadwire; miniature plug;** fiberglass insulated conductors; fiberglass jacket

#### **SHEATH DIAMETER** (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

**5** – Inconel® 600 (MI only)

#### **CALIBRATION** – Standard limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

*Special limits are available – consult AST*

*Dual junctions not available with all GP Thermocouples in sheath diameter 4 and GP07 diameter 6*

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

**E** – Exposed junction

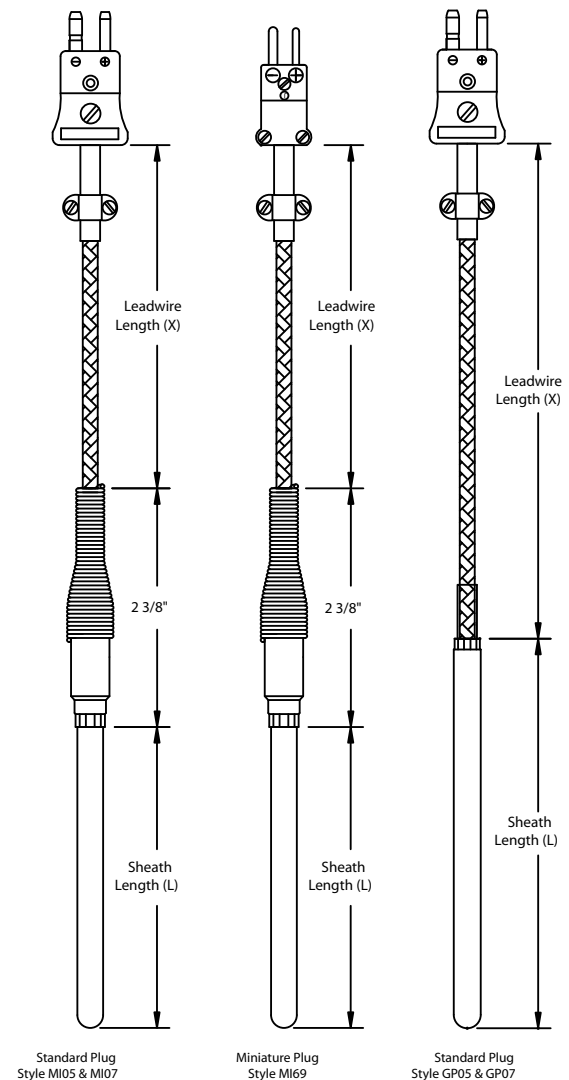
**SHEATH LENGTH** (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

#### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

#### **OPTIONS** – see page 1-13b



\*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.

## AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)
<b>PLUG AND JACK OPTIONS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ20	Standard jack, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. standard plug, rated to 260°C (500°F)

### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
WELD PADS			
WP00	Horizontal pad/flat		
WP10	1" nominal pipe size		
WP15	1.5" nominal pipe size		
WP20	2" nominal pipe size		
WP25	2.5" nominal pipe size		
WP30	3" nominal pipe size		
WP35	3.5" nominal pipe size		
WP40	4" nominal pipe size		

## **SHEATH WITH MALE PLUG**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

#### **SENSOR TYPE\***

**GP** – General purpose thermocouple

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**14** – Sheath with standard male plug; maximum termination temperature 177°C (350°F)

**74** – Sheath with miniature male plug; maximum sheath diameter 3/16" OD; maximum termination temperature 177°C (350°F)

#### **SHEATH DIAMETER** (in inches)

**3** – 1/16 (0.063) (Style MI 74 only)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250) (Style 14 only)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

**5** – Inconel® 600 (MI only)

#### **CALIBRATION** – Standard limits

**J** – Single J

**K** – Single K

**T** – Single T

**E** – Single E

*Special limits are available – consult AST*

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

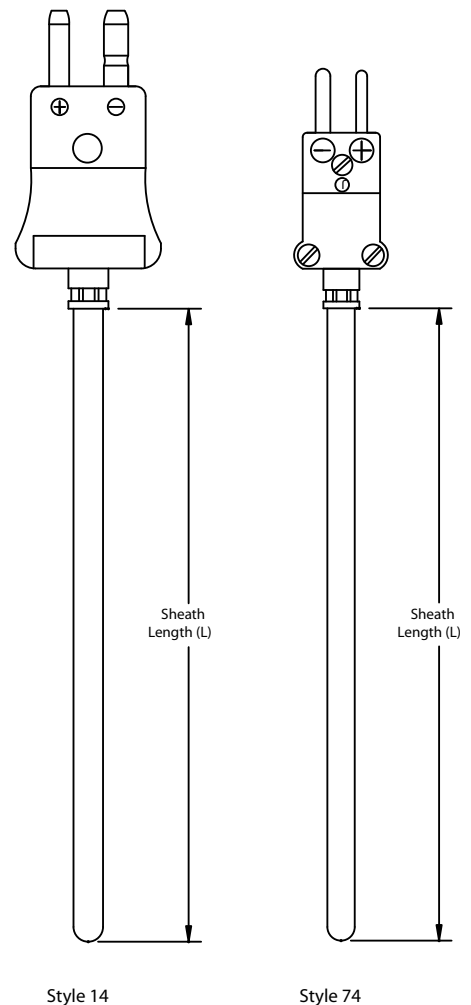
**E** – Exposed junction

**SHEATH LENGTH** (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

**L#** – (e.g., L6 = 6" sheath, L12.5 = 12.5" length)

**OPTIONS** – see page 1-14b

\*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.



## STYLES 14 & 74

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
PLUGS AND JACKS	
PJ20	Standard jack, rated to 177°C (350°F) (Style 14 only)
PJ40	Miniature jack, rated to 177°C (350°F) (Style 74 only)

#### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass

## CUTABLE SHEATH WITH LEADWIRE

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

#### SENSOR TYPE

**GP** – General purpose thermocouple

#### ASSEMBLY STYLE

**38** – Field cuttable sheath length with leadwire; fiberglass insulated conductors; fiberglass jacket; stainless steel overbraid; (cannot be shortened to less than 4")

#### SHEATH DIAMETER (in inches)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

#### SHEATH MATERIAL

**3** – 316 stainless steel

#### CALIBRATION - Standard limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

*Special limits are available- consult AST*

#### HOT JUNCTION

**G** – Grounded junction

**U** – Ungrounded junction

#### SHEATH LENGTH (Maximum L=96")

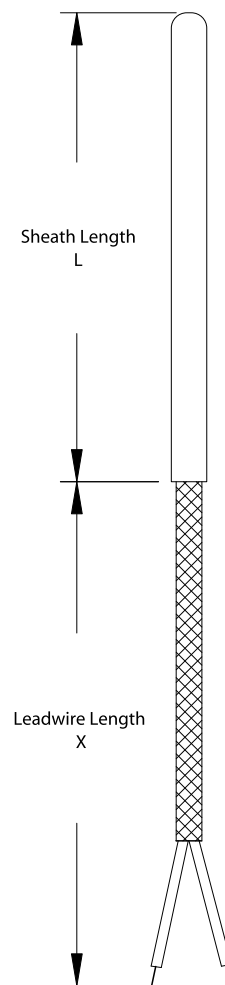
**L#** – (e.g., L24 = 24 inch sheath)

#### LEADWIRE LENGTH

**X#** – (e.g., X72 = 72 inch length)

#### OPTION

**TAG1** – stainless steel tag and wire



## STYLE 38



### **EXTENSION WIRE**

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

**Many additional components are available in our Sensor Box program, including spring-loaded fittings and plugs and jacks.**

**The Sensor Box allows you to build sensor assemblies on-site, saving time and expense. See the Sensor Box literature for further details.**



## **SPRING LOADED BAYONET FITTING WITH ARMOR**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	ARMOR CABLE LENGTH	OPTIONS

#### **SENSOR TYPE\***

**GP** – General purpose thermocouple

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**71 – Sheath with stainless steel armor;** fiberglass insulated conductors; fiberglass jacket; spring-loaded bayonet cap; (use with Bayonet Adapter- see options on page 1-16b)

#### **SHEATH DIAMETER** (in inches)

**6** – 3/16 (0.188)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

#### **CALIBRATION** - Standard limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

**SHEATH LENGTH** (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

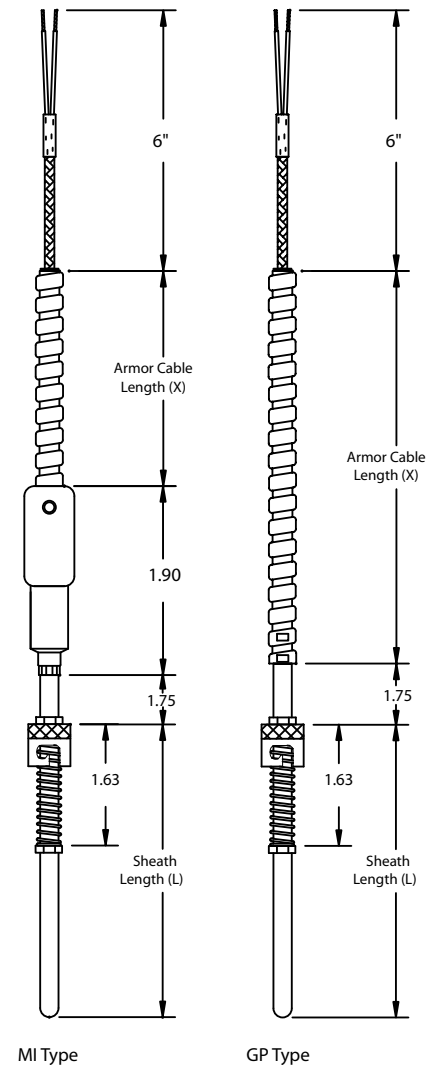
**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

#### **ARMOR CABLE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

#### **OPTIONS** – see page 1-16b

\*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.



## STYLE 71

### AVAILABLE OPTIONS and MODIFICATIONS

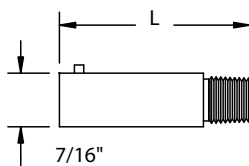
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
BD90	90° bend in sheath, 3/4" from back end of cap <b>Formerly Style 35</b>	
BD45	45° bend in sheath, 3/4" from back end of cap <b>Formerly Style 70</b>	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)	
BAYONET ADAPTERS (PLATED STEEL)		
Option Code	Thread Size	Length (L)
BA20	1/8" - 27 NPT	7/8"
BA22	1/8" - 27 NPT	1-1/2"
BA24	1/8" - 27 NPT	2-1/2"
PIPE CLAMP AND BAYONET ADAPTERS		
Option Code	Band Diameter	Adapter Length (l)
BA30	11/16" to 1-1/4"	2"
BA31	1-1/16" to 2"	2"
BA32	2-1/16" to 3"	2"
BA33	3-5/16" to 4-1/4"	2"
BA34	4-1/8" to 5"	2"

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. standard plug, rated to 260°C (500°F)
PJ60	High temp. standard jack, rated to 260°C (500°F)
BX CONNECTORS	
WC40	1/2"
WC50	3/4"

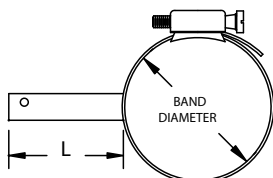
### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

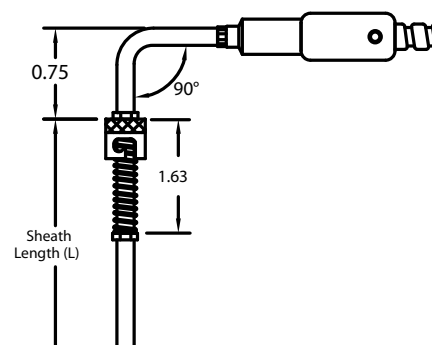
BAYONET ADAPTER  
(PLATED STEEL)



PIPE CLAMP WITH  
BAYONET ADAPTER



BD90 OPTION VIEW  
ON MI71 STYLE



## **SHEATH WITH WELDED PROCESS MOUNTING**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

#### **SENSOR TYPE**

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**23P** – Sheath with single-sided process mounting; fiberglass insulated conductors; fiberglass jacket; 1/2" NPT stainless steel connection with leadwire

**23I** – Sheath with single-sided instrument mounting; fiberglass insulated conductors; fiberglass jacket; 1/2" NPT stainless steel connection with leadwire

**24** – Sheath with double-sided hex fitting; fiberglass insulated conductors and jacket; 1/2" NPT stainless steel connection with leadwire

#### **SHEATH DIAMETER** (in inches)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

**3** – 316 stainless steel

**5** – Inconel® 600

#### **CALIBRATION** – Standard limits

**J** – Single J

**JJ** – Dual J

**K** – Single K

**KK** – Dual K

**T** – Single T

**TT** – Dual T

**E** – Single E

**EE** – Dual E

*Special limits are available – consult AST*

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

**E** – Exposed junction

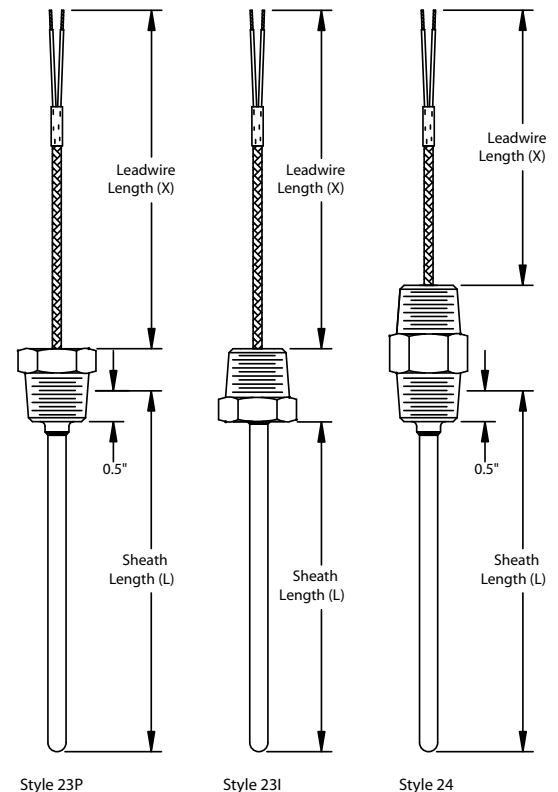
**SHEATH LENGTH** (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

#### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 1-17b



## STYLE 23I, 23P, 24

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
B90-	90° bend in sheath [specify length from tip in inches e.g., B90-6]
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. standard plug, rated to 260°C (500°F)
PJ60	High temp. standard jack, rated to 260°C (500°F)
WELD PADS (Style 23I only)	
WP00	Horizontal pad/flat
WP10	1" nominal pipe size
WP15	1.5" nominal pipe size
WP20	2" nominal pipe size
WP25	2.5" nominal pipe size
WP30	3" nominal pipe size
WP35	3.5" nominal pipe size
WP40	4" nominal pipe size

## WASHER WITH LEADWIRE AND ARMOR

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	WASHER SIZE	MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	ARMOR CABLE LENGTH	OPTIONS

#### **SENSOR TYPE\***

**GP** – General purpose thermocouple

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**32 – Washer with leadwire; fiberglass insulated conductors;** fiberglass jacket; armor cable; stainless steel washer thickness 1/4" (0.250); sheath diameter 0.188" only

#### **WASHER SIZE** (in inches)

FOR BOLT SIZE	ID	OD
<b>6</b> – 3/16 (0.188)	0.193	0.375
<b>7</b> – 1/4 (0.250)	0.255	0.500
<b>9</b> – 3/8 (0.375)	0.380	0.750
<b>10</b> – 1/2 (0.500)	0.510	1.000

#### **WASHER AND SHEATH MATERIAL**

**3** – 316 stainless steel

#### **CALIBRATION** Standard limits

**J** – Single J      **JJ** – Dual J

**K** – Single K      **KK** – Dual K

**T** – Single T      **TT** – Dual T

**E** – Single E      **EE** – Dual E

*Special limits are available – consult AST*

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

**SHEATH LENGTH** (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

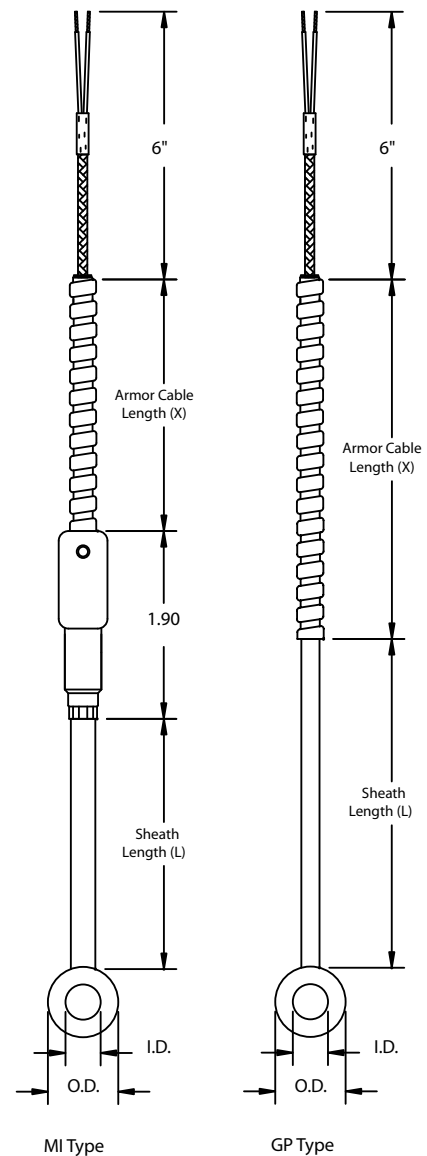
**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

#### **ARMOR CABLE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

#### **OPTIONS** – see page 1-18b

\*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.



## STYLE 32

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
B90-	90° bend in sheath [specify length from tip in inches e.g., B90-6]
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. plug, rated to 260°C (500°F)
PJ60	High temp. jack, rated to 260°C (500°F)
<b>BX CONNECTORS</b>	
WC40	1/2"
WC50	3/4"

#### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

## **MOUNTING LUG WITH LEADWIRE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	LUG HOLE SIZE	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

#### **SENSOR TYPE**

**GP** – General purpose thermocouple

#### **ASSEMBLY STYLE**

**41F** – Stainless steel mounting lug with fiberglass leadwire; diameter 0.312" only; 500°F max.

**41T** – Stainless steel mounting lug with Teflon® leadwire; diameter 0.312" only; 400°F max.

#### **LUG HOLE SIZE** - diameter of hole (in inches)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

#### **CALIBRATION** - Standard limits

**J** – Single J      **JJ** – Dual J

**K** – Single K      **KK** – Dual K

**T** – Single T      **TT** – Dual T

**E** – Single E      **EE** – Dual E

#### **HOT JUNCTION**

**G** – Grounded junction

**U** – Ungrounded junction

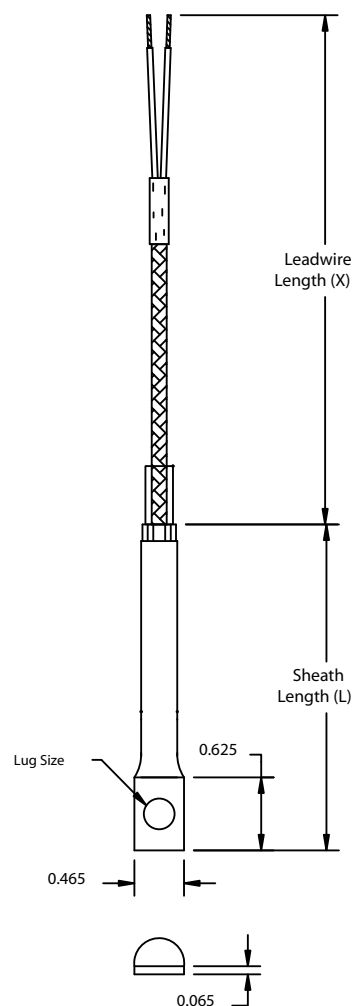
#### **SHEATH LENGTH** (Maximum L=96")

**L#** - (e.g., L6 = 6 inch sheath)

#### **LEADWIRE LENGTH**

**X#** - (e.g., X72 = 72 inch length)

#### **OPTIONS** – see page 1-19b



## STYLES 41F & 41T

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. standard plug, rated to 260°C (500°F)
PJ60	High temp. standard jack, rated to 260°C (500°F)

#### EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.



## **ATEX-APPROVED, CONNECTION HEAD WITH WELDED NPT PROCESS CONNECTION**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

#### **SENSOR TYPE**

**MI** – Mineral insulated thermocouple

#### **ASSEMBLY STYLE**

**22 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection;** head ATEX approved for EEx d IIC; IP66 to 68; screw cover with chain and gasketed o-ring, meets NEMA 4X; ceramic terminal block; 3/4" NPT conduit connection; internal and external ground screws (Note: for spring-loaded fitting, see Style 75 and add optional head).

#### **SHEATH DIAMETER** (in inches)

- 4** – 1/8 (0.125)
- 6** – 3/16 (0.188)
- 7** – 1/4 (0.250)
- 9** – 3/8 (0.375)

#### **SHEATH MATERIAL**

- 3** – 316 stainless steel
- 5** – Inconel® 600

#### **CALIBRATION** – Standard limits

- J** – Single J      **JJ** – Dual J
- K** – Single K      **KK** – Dual K
- T** – Single T      **TT** – Dual T
- E** – Single E      **EE** – Dual E

*Special limits are available – consult AST*

#### **HOT JUNCTION**

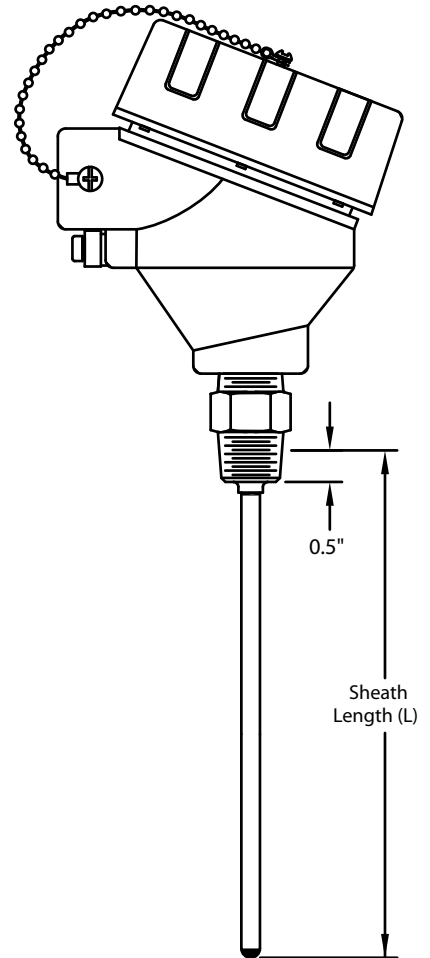
- G** – Grounded junction
- U** – Ungrounded junction
- E** – Exposed junction

(Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

#### **SHEATH LENGTH**

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

**OPTIONS** – see page 1-20b



## STYLE 22

### AVAILABLE OPTIONS and MODIFICATIONS

TERMINAL HEAD OPTION		
Same specification as standard head		
Option Code	Process Connection	Conduit Connection
HD72	1/2"	1/2"
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
PC25	1/4" NPT process connection	
PC75	3/4" NPT process connection	
CAL1	Calibration, NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
TRANSMITTERS – For complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C)	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

## **NEMA 4 CONNECTION HEAD WITH WELDED PROCESS CONNECTION**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-1b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction **(For dual element, add prefix "D", e.g., DRTP1)**

### **ASSEMBLY STYLE**

**15 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection;** head conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; gasketed screw cover with stainless steel chain

**SHEATH DIAMETER** (in inches) (see page 2-1b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

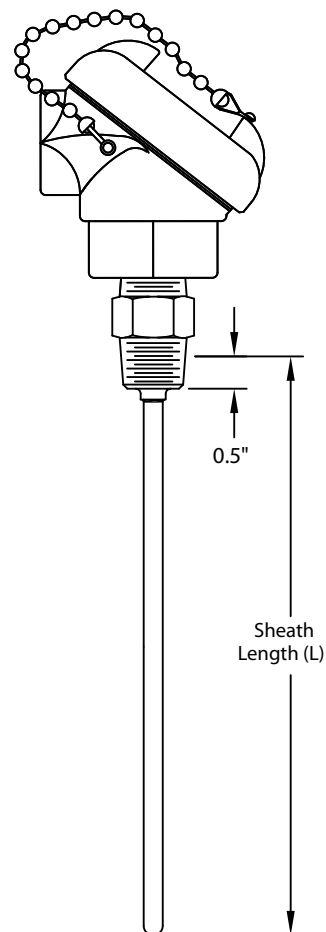
**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

**OPTIONS** – see page 2-1b



# STYLE 15

## AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
<b>TRANSMITTERS</b> – For complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
<b>OPTIONAL ELEMENTS</b>		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		

NEMA 4 OR 4X TERMINAL HEAD OPTIONS							
Head without ground screw		Head with internal ground screw		Process Connection		Conduit Connection	
Cast aluminum, screw cover with chain, NEMA 4							
HD10*		HD11 *		1/2"		1/2"	
Std.*		HD13*		1/2"		3/4"	
Epoxy-coated aluminum, screw cover with chain, NEMA 4X							
HD50*		HD51 *		1/2"		1/2"	
HD52*		HD53*		1/2"		3/4"	
Cast iron, screw cover with chain, NEMA 4							
HD20*		HD21 *		1/2"		1/2"	
HD22*		HD23 *		1/2"		3/4"	
316 stainless steel, screw cover with chain, NEMA 4X							
HD40*		HD41 *		1/2"		3/4"	
White polypropylene, screw cover with chain, NEMA 4							
HD30		N/A		1/2"		3/4"	
Black polypropylene, screw cover with chain, NEMA 4							
HD31		N/A		1/2"		3/4"	
Nylon, screw cover							
HD32		N/A		1/2"		1/2"	
*can be used with transmitters							
Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

### Notes:

1. See Accessories for additional information
2. For former Style 16, use option HD20
3. For former Style 29, use option HD32

## NEMA 4 CONNECTION HEAD WITH SPRING-LOADED ASSEMBLY AND MOUNTING HARDWARE

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-2b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### ASSEMBLY STYLE

**45** – Sheath with cast aluminum head; spring-loaded in head; conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT process connection; gasketed screw cover with stainless steel chain

### CONNECTION

**H** – Head only; 1/2" NPT (female) instrument connection

**N** – 1/2" NPT carbon steel nipple only

**NU** – 1/2" NPT carbon steel nipple and union

**NUN** – 1/2" NPT carbon steel nipple, union and nipple

Add suffix **"1S"** for 304 stainless steel

Add suffix **"2S"** for 316 stainless steel

See chart below for restrictions

### CONNECTION LENGTH

**###** – (e.g., 006 = 6 inch)

See chart below for standard available lengths

**SHEATH DIAMETER** (in inches) (see page 2-2b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### SHEATH MATERIAL

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**3** – -45 to 788°C (-50 to 1450°F)

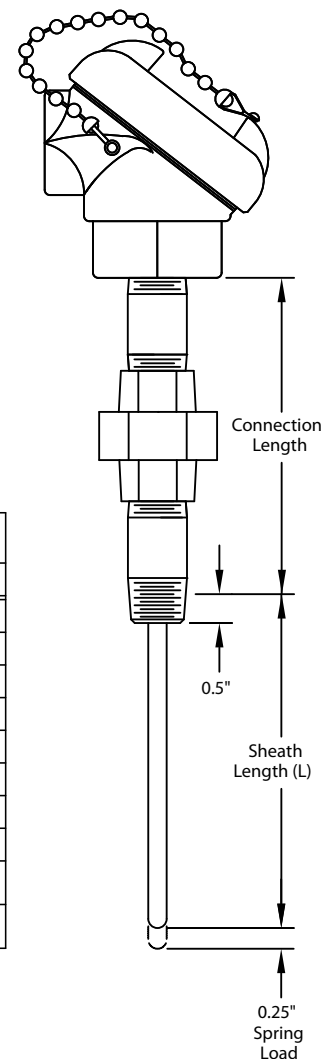
**4** – -200 to 260°C (-328 to 500°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

**OPTIONS** – see page 2-2b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00 *
1.00	3.00	4.00 *
1.50	3.50	5.00
2.00	4.00	6.00 *
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
* NUN 2S OPTION AVAILABLE IN THESE LENGTHS ONLY.		
DIMENSIONS ARE GIVEN IN INCHES		



## STYLE 45

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
Transmitters: see Style 48		
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		

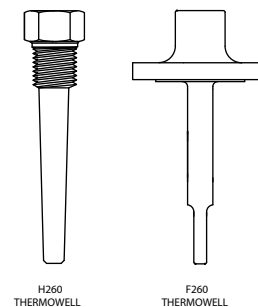
NEMA 4 OR 4X TERMINAL HEAD OPTIONS							
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection				
Cast aluminum, screw cover with chain, NEMA 4							
HD10	HD11	1/2"	1/2"				
Std.	HD13	1/2"	3/4"				
Epoxy-coated aluminum, screw cover with chain, NEMA 4X							
HD50	HD51	1/2"	1/2"				
HD52	HD53	1/2"	3/4"				
Cast iron, screw cover with chain, NEMA 4							
HD20	HD21	1/2"	1/2"				
HD22	HD23	1/2"	3/4"				
316 stainless steel, screw cover with chain, NEMA 4X							
HD40	HD41	1/2"	3/4"				
Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

Note:

- For former Style 46, use option HD20

### THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.



**Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements.**

## **EXPLOSION-PROOF CONNECTION HEAD WITH WELDED PROCESS CONNECTION**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-3b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D" - e.g., DRTP1)**

### **ASSEMBLY STYLE**

**78** – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection; head CSA/FM approved for Class I, Division I, Groups B, C, D; Class II, Groups E, F, G; screw cover with chain and gasketed o-ring; meets NEMA 4; ceramic terminal block; 1/2" NPT conduit connection

**SHEATH DIAMETER** (in inches) (see page 2-3b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

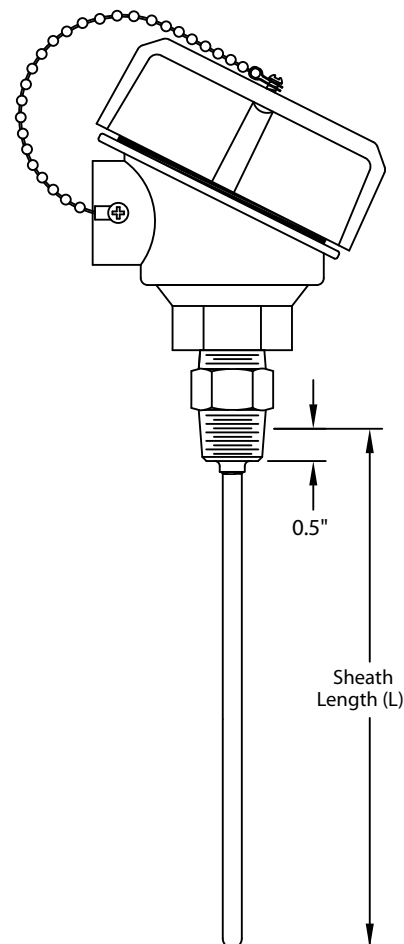
**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

**OPTIONS** – see page 2-3b



## STYLE 78

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
PC25	1/4" NPT process connection	
PC75	3/4" NPT process connection	
CAL1	Calibration, NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
TRANSMITTERS – For complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C)	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

EXPLOSION-PROOF TERMINAL HEAD OPTIONS							
Option Code		Process Connection			Conduit Connection		
Cast aluminum; screw cover with chain; o-ring gasket (Gasket rated to 100°C exposure); ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C and D; Class II Groups E, F and G; internal ground screw.							
HD71		1/2"			3/4"		
Epoxy-coated, same specs as HD71							
HD80		1/2"			1/2"		
HD81		1/2"			3/4"		
Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

Note: See Accessories section for additional specs.



## **EXPLOSION-PROOF CONNECTION HEAD WITH SPRING-LOADED ASSEMBLY AND MOUNTING HARDWARE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-4b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm$  0.12% @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**77** – Sheath with cast aluminum head; spring-loaded in head; head CSA/FM approved for Class I, Division I, Groups B, C, D; Class II, Groups E, F, G, including union; screw cover with chain and gasketed o-ring. Ceramic terminal block; 1/2" NPT conduit and process connections

### **CONNECTION**

**H** – Head only; 1/2" NPT (female) instrument connection

**N** – 1/2" NPT carbon steel nipple only

**NU** – 1/2" NPT carbon steel nipple and plated steel union

**NUN** – 1/2" NPT carbon steel nipples and plated steel union

Add suffix **"1S"** for 304 stainless steel nipples

### **CONNECTION LENGTH**

**###** – (e.g., 006=6 inch)

See chart below for standard available lengths.

**SHEATH DIAMETER** (in inches) (see page 2-4b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**3** – -45 to 788°C (-50 to 1450°F)

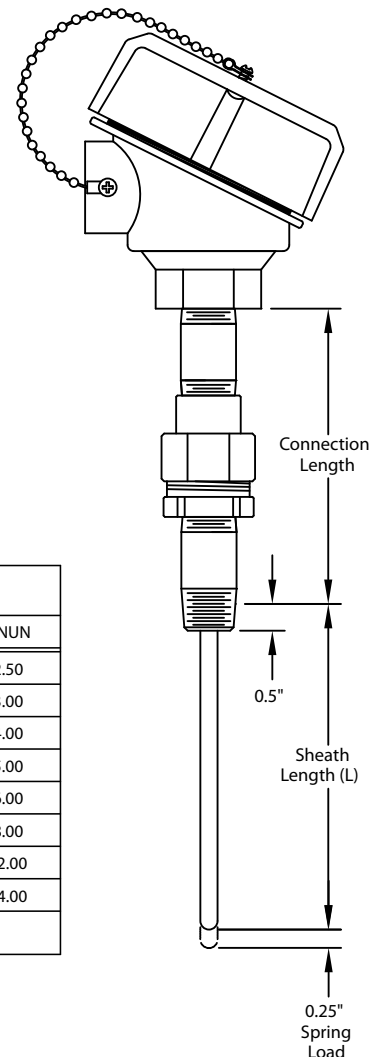
**4** – -200 to 260°C (-328 to 500°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

**OPTIONS** – see page 2-4b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00
1.00	3.00	4.00
1.50	3.50	5.00
2.00	4.00	6.00
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
DIMENSIONS ARE GIVEN IN INCHES		



## STYLE 77

### AVAILABLE OPTIONS and MODIFICATIONS

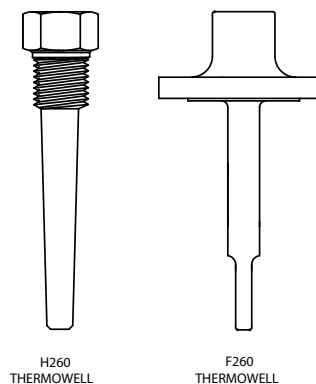
ASSEMBLY OPTIONS		
Option Codes	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
TRANSMITTERS		
See Style 48 for available transmitters		
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		

EXPLOSION-PROOF TERMINAL HEAD OPTIONS							
Option Code		Process Connection			Conduit Connection		
Cast aluminum; screw cover with chain; o-ring gasket; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C and D; Class II Groups E, F and G (Gasket rated to 100°C exposure); internal ground screw							
HD71		1/2"			3/4"		
Same as above, except epoxy-coated							
HD80		1/2"			1/2"		
HD81		1/2"			3/4"		
Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

Note: See Accessories section for outline drawings and additional specs.

### THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.



H260  
THERMOWELL

F260  
THERMOWELL

## **CONNECTION HEAD WITH WELDED HEX FITTING**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-5b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**21 – Sheath with head;** for use as ambient sensor or with compression fitting for process mounting. See page 2-5b for head options.

**SHEATH DIAMETER** (in inches) (see page 2-5b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

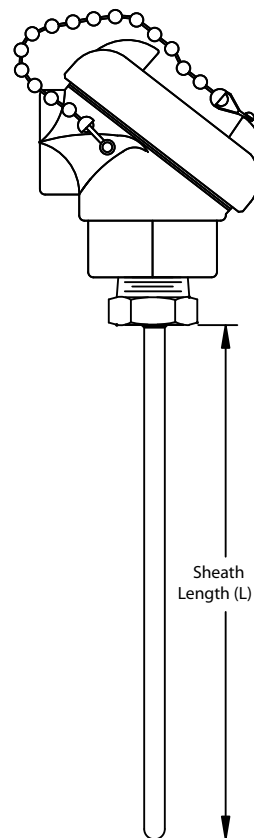
**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6" sheath)

**OPTIONS** – see page 2-5b



Style 21

ASSEMBLY OPTIONS			
Option Code	Description		
TAG1	Stainless steel tag and wire		
B90-	90° bend in sheath [specify length from tip in inches e.g., B90-6]		
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)		
CAL1	NIST traceable calibration [specify point(s)]		
CRT1	Certificate of conformance		
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections		
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections		
TRANSMITTERS - for complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			

## STYLE 21

### AVAILABLE OPTIONS and MODIFICATIONS

EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw		
HD70*	1/2"	1/2"
HD71*	1/2"	3/4"
Epoxy-coated (same specs as HD70)		
HD80*	1/2"	1/2"
HD81*	1/2"	3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws		
HD72*	1/2"	1/2"
HD73*	1/2"	3/4"
Cast aluminum (formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.		
HD60	1/2"	1/2"
HD61	1/2"	3/4"

#### Smallest Diameter Sheath Available By Sensor Type and Temperature Range

SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

#### OPTIONAL ELEMENTS

RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.

Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>

Notes:

- For dual element, add prefix "D" (e.g., DRTP6)
- Additional materials, curves and resistance values are available - see Capabilities brochure.

**Note: Many non-standard options, including additional sheath diameters and materials, may also be available - consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.**

**UE** APPLIED SENSOR TECHNOLOGIES  
A Division of UNITED ELECTRIC CONTROLS

## **DOUBLE-SIDED, SPRING-LOADED PROCESS MOUNTING WITH TERMINAL HEAD OPTIONS**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-6b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**75** – Sheath with double-sided, spring-loaded fitting; Teflon® insulated conductors; 1/2" NPT stainless steel connection. (Note: a variety of terminal heads may be added to this style – see page 2-6b)

**SHEATH DIAMETER** (in inches) (see page 2-6b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

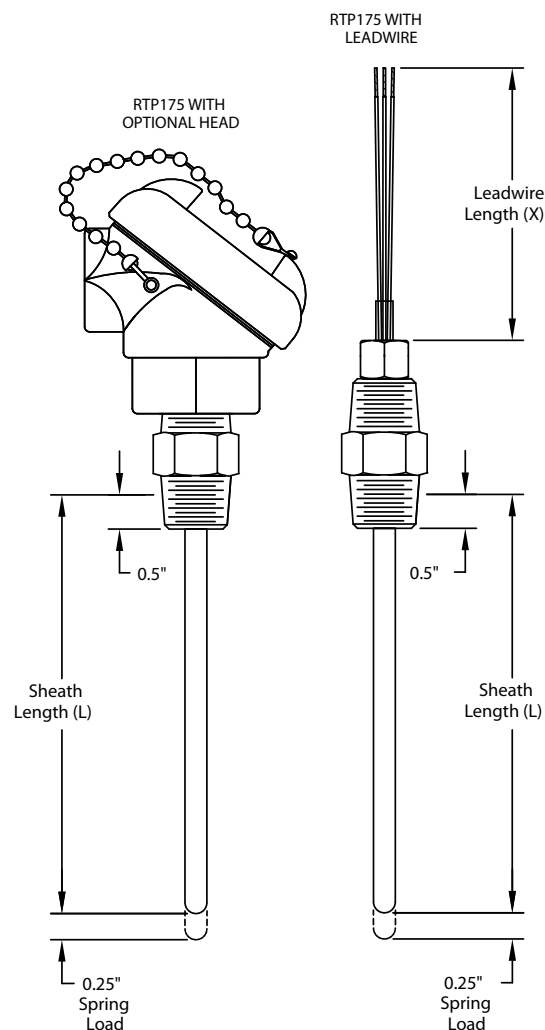
**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

### **LEADWIRE LENGTH**

**X#** – (e.g., X3=3 inch length; X3 is standard if specifying a terminal head)

**OPTIONS** – see page 2-6b



ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
TRANSMITTERS		
TR11	4-20 mA, 2-wire; single input; isolated output; specify range, units of measure (e.g., 0-200°C) and terminal head with *. See Accessories section for additional information.	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw		
HD70*	1/2"	1/2"
HD71*	1/2"	3/4"
Epoxy-coated (same spec as HD70/HD71)		
HD80*	1/2"	1/2"
HD81*	1/2"	3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws		
HD72*	1/2"	1/2"
HD73*	1/2"	3/4"
Cast aluminum (formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.		
HD60	1/2"	1/2"
HD61	1/2"	3/4"

## STYLE 75

### AVAILABLE OPTIONS and MODIFICATIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS							
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection				
Cast aluminum, screw cover with chain, NEMA 4							
HD10*	HD11 *	1/2"	1/2"				
HD12*	HD13 *	1/2"	3/4"				
Epoxy-coated aluminum, screw cover with chain, NEMA 4X							
HD50*	HD51 *	1/2"	1/2"				
HD52*	HD53 *	1/2"	3/4"				
Cast iron, screw cover with chain, NEMA 4							
HD20*	HD21 *	1/2"	1/2"				
HD22*	HD23 *	1/2"	3/4"				
316 stainless steel, screw cover with chain, NEMA 4X							
HD40*	HD41 *	1/2"	3/4"				
White polypropylene, screw cover with chain, NEMA 4							
HD30	N/A	1/2"	3/4"				
Black polypropylene, screw cover with chain, NEMA 4							
HD31	N/A	1/2"	3/4"				
Nylon, screw cover							
HD32	N/A	1/2"	1/2"				
*can be used with transmitterS							
Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

### THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

**Note:** Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.

## SPRING-LOADED PROCESS MOUNTING HARDWARE WITH OPTIONAL TERMINAL HEAD

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION TYPE AND MATERIAL	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

#### SENSOR TYPE (See page 2-7b for optional elements)

**RTPT1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., **DRTP1**)

#### ASSEMBLY STYLE

**48** – Sheath with spring-loaded hex connector and connection hardware; head as option

#### CONNECTION TYPE AND MATERIAL

Code	Union Type	Union Material	Lower Nipple Material
<b>NU</b>	Ordinary location	Carbon steel	None
<b>NUS</b>	Ordinary location	Stainless steel	None
<b>NUX</b>	Explosion-proof	Electroplated steel	None
<b>NUN</b>	Ordinary location	Carbon steel	Carbon steel
<b>NUNS</b>	Ordinary location	Stainless steel	Stainless steel
<b>NUNX</b>	Explosion-proof	Electroplated steel	Carbon steel
<b>NUNXS</b>	Explosion-proof	Electroplated steel	Stainless steel

#### CONNECTION LENGTH (For NU, NUX, NUS, use 002.5)

**###** (e.g., 006 = 6 inch)

(See chart below for available standard lengths)

#### SHEATH DIAMETER (in inches) (see page 2-7b for restrictions)

**4** – 1/8" (0.125)

**6** – 3/16" (0.188)

**7** – 1/4" (0.250)

**9** – 3/8" (0.375)

#### SHEATH MATERIAL

**3** – 316 stainless steel

#### TEMPERATURE RANGE - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

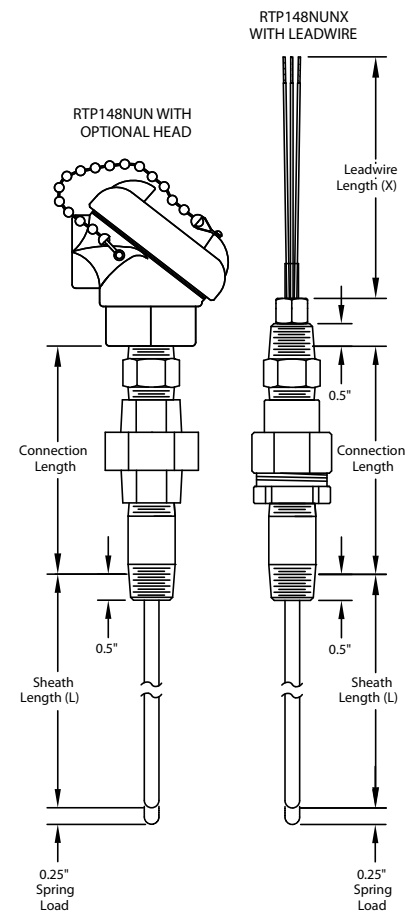
#### SHEATH LENGTH (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

#### LEADWIRE LENGTH

**X#** – (e.g., X3 = 3 inch length; X3 is standard if specifying optional head)

**OPTIONS** – see page 2-7b



STANDARD AVAILABLE CONNECTION LENGTHS FOR NUN CONNECTIONS
3.00
3.50
4.00
4.50
5.00
6.00
8.00
DIMENSIONS ARE GIVEN IN INCHES

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
TRANSMITTERS - for complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire; single input; isolated output; specify range, units of measure (e.g., 0-200°C) and terminal head with *. See Accessories section for additional information.	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw		
HD70*	1/2"	1/2"
HD71 *	1/2"	3/4"
Epoxy-coated (same specs as HD70/HD71)		
HD80*	1/2"	1/2"
HD81 *	1/2"	3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws		
HD72*	1/2"	1/2"
HD73 *	1/2"	3/4"
Cast aluminum (Formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.		
HD60	1/2"	1/2"
HD61	1/2"	3/4"

## STYLE 48

### AVAILABLE OPTIONS and MODIFICATIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS							
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection				
Cast aluminum, screw cover with chain, NEMA 4							
HD10*	HD11*	1/2"	1/2"				
HD12*	HD13*	1/2"	3/4"				
Epoxy-coated aluminum, screw cover with chain, NEMA 4X							
HD50*	HD51*	1/2"	1/2"				
HD52*	HD53*	1/2"	3/4"				
Cast iron, screw cover with chain, NEMA 4							
HD20*	HD21*	1/2"	1/2"				
HD22*	HD23*	1/2"	3/4"				
316 stainless steel, screw cover with chain, NEMA 4X							
HD40*	HD41*	1/2"	3/4"				
White polypropylene, screw cover with chain, NEMA 4							
HD30	N/A	1/2"	3/4"				
Black polypropylene, screw cover with chain, NEMA 4							
HD31	N/A	1/2"	3/4"				
Nylon, screw cover							
HD32	N/A	1/2"	1/2"				
*can be used with transmitters							
Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

Note: See Accessories section for outline drawings and additional specs.

### THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

**Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.**



## **SANITARY PROCESS CONNECTION WITH TERMINAL HEAD**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CAP SIZE	CAP STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-8b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**33 – Sheath with sanitary process connection and white polypropylene head;** 3/4" NPT conduit connection; ceramic terminal block; maximum termination temperature 104°C (220°F)

### **CAP SIZE**

**A** – 0.50\*      **E** – 2.00

**B** – 0.75\*      **F** – 2.50

**C** – 1.00      **G** – 3.00

**D** – 1.50      **H** – 4.00

\*Available in cap style C only

### **CAP STYLE**

**A** – 16 A Tri Clamp® cap

**C** – 16AMP Tri Clamp® cap

### **SHEATH DIAMETER**

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

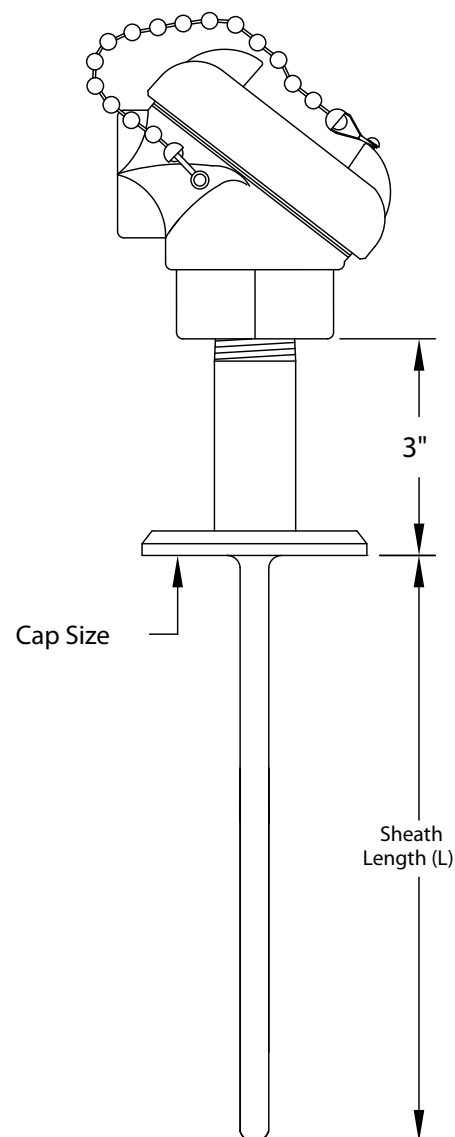
**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 200°C (-50 to 400°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

**OPTIONS** – see page 2-8b



Tri Clamp® is a registered trademark of Alfa-Laval, Inc.

## STYLE 33

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
TRANSMITTERS		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and head with *.	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP1)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4 (Formerly Style 67)			
HD10*	HD11 *	1/2"	1/2"
HD12*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
*can be used with TR11 transmitter			

## **SANITARY CONNECTION WITH LEADWIRE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CAP SIZE	CAP STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-9b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

### **ASSEMBLY STYLE**

**58 – Sheath with leadwire; sanitary process connection;** Teflon® insulated conductors; Teflon® jacketed cable

### **CAP SIZE** (in inches)

**A** – 0.50\*      **E** – 2.00

**B** – 0.75\*      **F** – 2.50

**C** – 1.00      **G** – 3.00

**D** – 1.50      **H** – 4.00

\*Available in Cap Style C only.

### **CAP STYLE**

**A** – 16 A Tri Clamp® cap

**C** – 16AMP Tri Clamp® cap

### **SHEATH DIAMETER** (in inches)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

### **TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 200°C (-50 to 400°F)

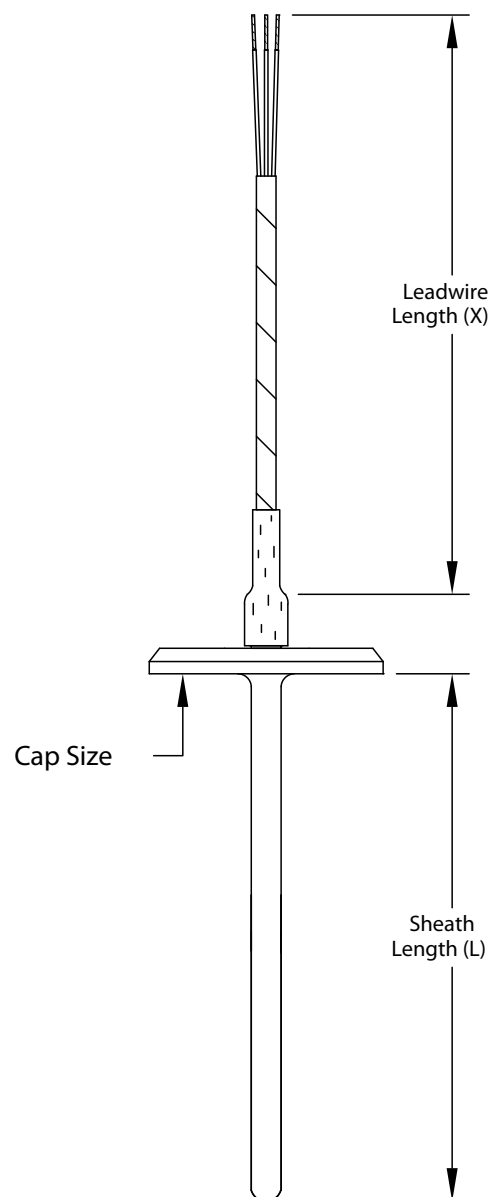
### **SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 2-9b



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Tri Clamp® is a registered trademark of Alfa-Laval, Inc.

## STYLE 58

### **AVAILABLE OPTIONS and MODIFICATIONS**

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify points]	
CRT1	Certificate of conformance	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
Note: additional materials, curves and resistance values are available - see Capabilities brochure.		

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminal
WC98	#8 ring terminal

## **SHEATH WITH LEADWIRE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-10b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**20 – Sheath with leadwire;** Teflon® insulated conductors; no jacket

**28 – Sheath with Teflon® jacketed cable;** Teflon® insulated conductors

**SHEATH DIAMETER** (in inches) (see page 2-10b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

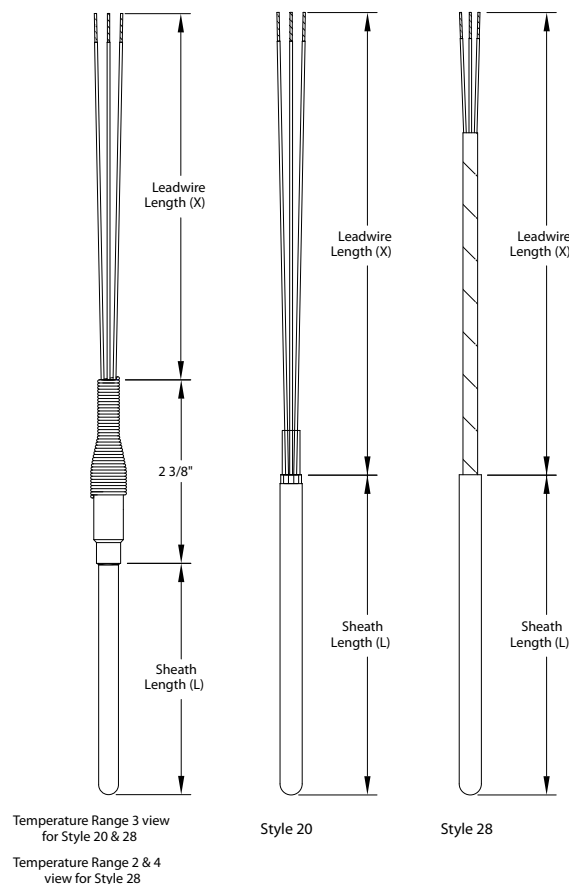
**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 2-10b



Teflon® is a registered trademark of DuPont

ASSEMBLY OPTIONS			
Option Code	Description		
TAG1	Stainless steel tag and wire		
CAL1	NIST traceable calibration [specify point(s)]		
CRT1	Certificate of conformance		
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6 [minimum length = 3"])		
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6 [minimum length = 3"])		
WIRING CONNECTION OPTIONS			
Option Code	Description		
WC76	#6 spade terminals, plated copper		
WC70	#10 spade terminals, plated copper		
WC84	1/4" push-on insulated terminals, plated copper		
WC90	#10 ring terminals		
WC98	#8 ring terminals		
PLUGS AND JACKS (For 2 and 3 wire constructions only. Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)			
PJ10	Standard plug, rated to 177°C (350°F)		
PJ20	Standard jack, rated to 177°C (350°F)		
For flexible stainless steel armor, see Style 03			
OPTIONAL ELEMENTS			
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.			
Option Code	Accuracy (at 0°C)	Construction	
RTP1 (std.)	±0.12%	3-wire	
RTP1A	±0.06%	3-wire	
RTP1AA	±0.01%	3-wire	
RTP6	±0.12%	2-wire	
RTP7	±0.12%	4-wire	
RTP7A	±0.06%	4-wire	
RTP7AA	±0.01%	4-wire	
Notes:			
1. For dual element, add prefix "D" (e.g., DRTP6)			
2. Additional materials, curves and resistance values are available - see Capabilities brochure.			
COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass

## STYLES 20 & 28

### AVAILABLE OPTIONS and MODIFICATIONS

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
Style 20, SINGLE							
Temp Range	RTP 1	RTP 1A		RTP 6	RTP 7	RTP 7A	
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
Style 20, DUAL							
Temp Range	DRTP 1			DRTP 6	DRTP 7		
1	3/16	3/16	3/16	3/16	1/4	1/4	1/4
2	1/4	1/4	1/4	3/16	3/8	3/8	3/8
3	1/4			1/4	1/4		
4	3/16			3/16	1/4		
Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
Style 28, SINGLE ONLY							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8				
2	3/16	3/16	3/16				
3	3/16						
4	1/8						

## **SHEATH WITH LEADWIRE AND ARMOR CABLE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-11b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**03** – Sheath with leadwire and flexible stainless steel armor cable; Teflon® insulated conductors

**03P** – PVC coated armor

**03T** – Teflon® coated armor

**SHEATH DIAMETER** (in inches) (see page 2-11b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

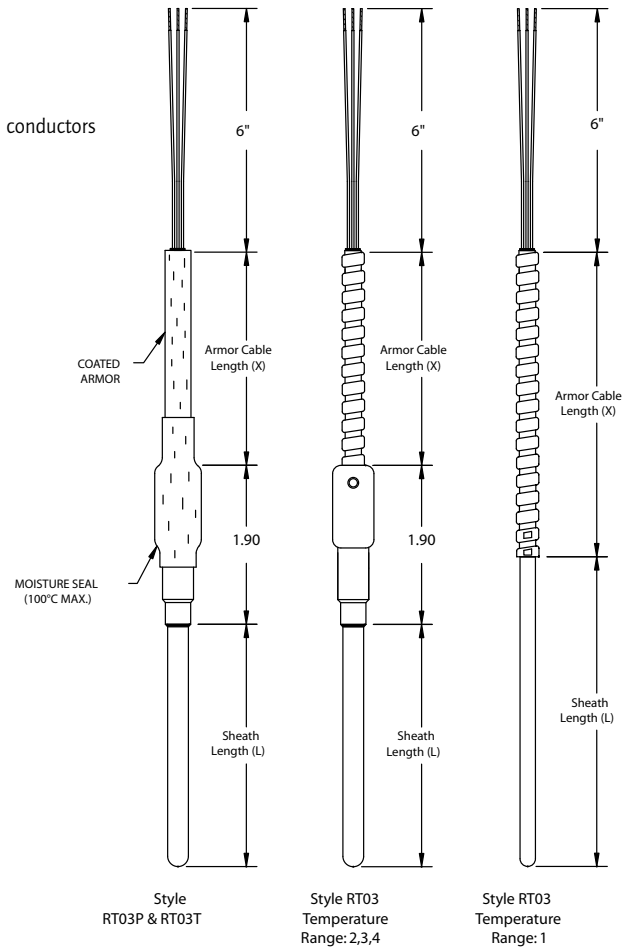
**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

### **ARMOR CABLE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 2-11b



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## STYLE 03

### AVAILABLE OPTIONS AND MODIFICATIONS

ASSEMBLY OPTIONS			
Option Code		Description	
TAG1		Stainless steel tag and wire	
CAL1		NIST traceable calibration [specify point(s)]	
CRT1		Certificate of conformance	
B45–		45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90–		90° bend in sheath (specify length from tip in inches e.g., B90-6)	
ARMOR OPTIONS			
BA50		Bayonet cap on armor (Style 03, temperature range 1 only) – formerly Style 25	
<b>PLUGS AND JACKS</b> (2 and 3-wire construction only. Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)			
PJ10		Standard plug, rated to 177°C (350°F)	
PJ20		Standard jack, rated to 177°C (350°F)	
WELD PADS			
WP00		Horizontal pad/flat	
WP10		1" nominal pipe size	
WP15		1.5" nominal pipe size	
WP20		2" nominal pipe size	
WP25		2.5" nominal pipe size	
WP30		3" nominal pipe size	
WP35		3.5" nominal pipe size	
WP40		4" nominal pipe size	
COMPRESSION FITTINGS			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16	1/4	1/4	1/4
2	1/4	1/4	1/4	3/16	3/8	3/8	3/8
3	1/4			1/4	1/4		
4	3/16			3/16	1/4		
OPTIONAL ELEMENTS							
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.							
Option Code		Accuracy (at 0°C)			Construction		
RTP1 (std.)		±0.12%			3-wire		
RTP1A		±0.06%			3-wire		
RTP1AA		±0.01%			3-wire		
RTP6		±0.12%			2-wire		
RTP7		±0.12%			4-wire		
RTP7A		±0.06%			4-wire		
RTP7AA		±0.01%			4-wire		
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.							
WIRING CONNECTION OPTIONS							
Option Code		Description					
WC76		#6 spade terminals					
WC70		#10 spade terminals, plated copper					
WC84		1/4" push-on insulated terminals, plated copper					
WC90		#10 ring terminals					
WC98		#8 ring terminals					
BX CONNECTORS							
WC40		1/2"					
WC50		3/4"					
Note: for assembly with sheath, armor and terminal head, see Style 66.							



## **SHEATH WITH MALE PLUG**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-12b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

### **ASSEMBLY STYLE**

**14** – Sheath with standard male plug; hollow pins; maximum termination temperature 177°C (350°F)

**SHEATH DIAMETER** (in inches)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

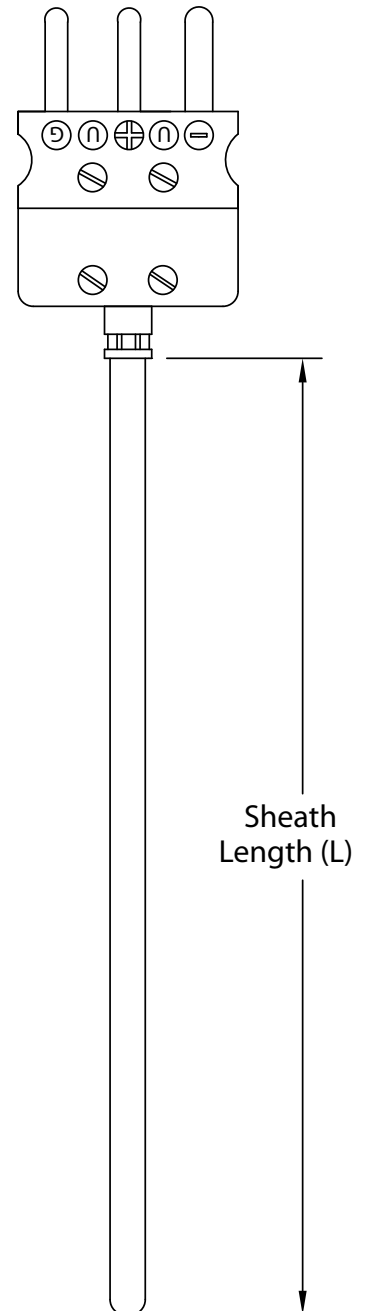
**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

**OPTIONS** – see page 2-12b



## STYLE 14

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
Note: additional materials, curves and resistance values are available - see Capabilities brochure.		

COMPRESSION FITTINGS			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass

## **CUTABLE SHEATH WITH LEADWIRE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH

#### **SENSOR TYPE**

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

#### **ASSEMBLY STYLE**

**38** – Field cutable sheath length with leadwire; Teflon® insulated conductors for temperature range 1; Fiberglass insulated conductors for temperature range 2; cannot be cut to less than 4"

#### **SHEATH DIAMETER**

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

#### **SHEATH MATERIAL**

**3** – stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

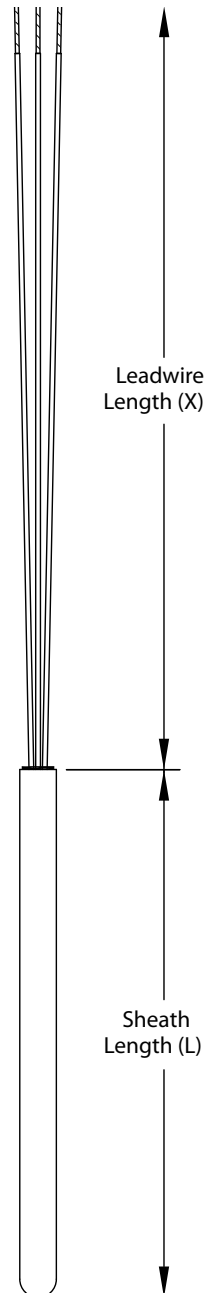
**L#** – (e.g., L6 = 6 inch sheath)

#### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

#### **OPTION**

**TAG1** – stainless steel tag and wire



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Style 38

## STYLE 38



**Many additional components are available in our Sensor Box program, including spring-loaded fittings and plugs and jacks.**

**The Sensor Box allows you to build sensor assemblies on-site, saving time and expense. See the Sensor Box literature for further details.**

## **WELD PAD WITH LEADWIRE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-14b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

### **ASSEMBLY STYLE**

**39 – Sheath with flat weld pad and leadwire;** Teflon® insulated conductors; Teflon® jacket; pad same material as sheath, 1" X 1" pad size; 1/8" pad thickness; radiused pad available as an option.

### **SHEATH DIAMETER**

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

### **SHEATH MATERIAL**

**3** – stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

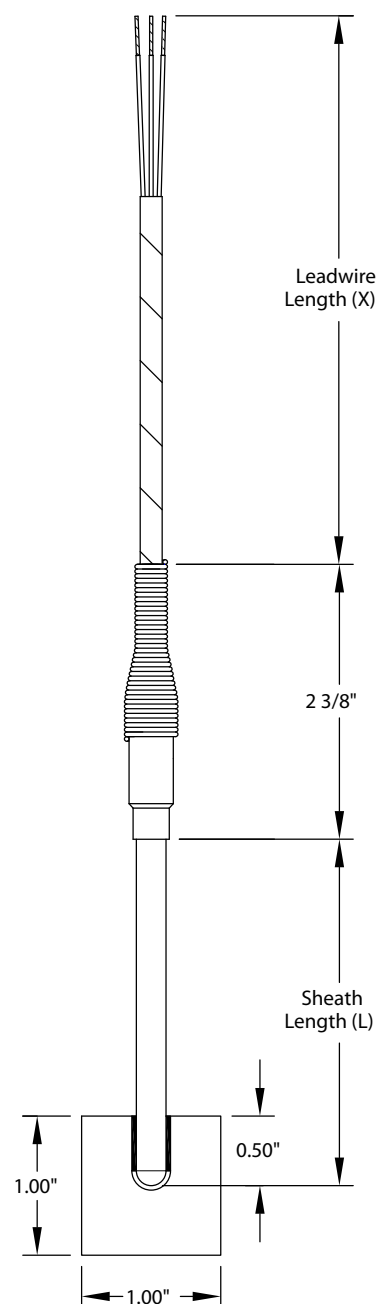
**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 2-14b



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## STYLE 39

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
Note: additional materials, curves and resistance values are available - see Capabilities brochure.		

WELD PADS	
Pads are normally supplied flat. For matching a pipe radius, use the codes below:	
WP10	1" nominal pipe size
WP15	1.5" nominal pipe size
WP20	2" nominal pipe size
WP25	2.5" nominal pipe size
WP30	3" nominal pipe size
WP35	3.5" nominal pipe size
WP40	4" nominal pipe size

## **SHEATH WITH WELDED PROCESS MOUNTING**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-15b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**23I – Sheath with single sided instrument mounting;** Teflon® insulated conductors; 1/2" NPT stainless steel connection with leadwire

**23P – Sheath with single sided process mounting;** Teflon® insulated conductors; 1/2" NPT stainless steel connection with leadwire

**24 – Sheath with double-sided mounting;** Teflon® insulated conductors; 1/2" NPT stainless steel connection

**SHEATH DIAMETER** (in inches) (see page 2-15b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

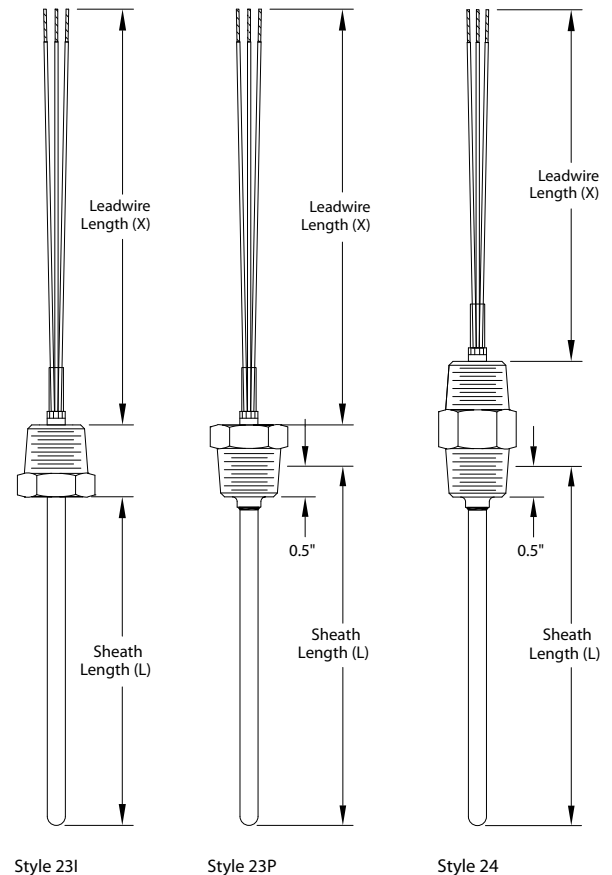
**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 2-15b



# STYLES 231, 23P & 24

## AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)	
For spring-loaded design, see Style 75		
For terminal heads, see Styles 15 and 21		
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
<b>PLUGS AND JACKS</b> (Available on 23P only, 2 and 3 wire constructions only. Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16	1/4	1/4	1/4
2	1/4	1/4	1/4	3/16	3/8	3/8	3/8
3	1/4			1/4	1/4		
4	3/16			3/16	1/4		
WELD PADS (Style 231 only)							
WP00	Horizontal pad/flat						
WP10	1" nominal pipe size						
WP15	1.5" nominal pipe size						
WP20	2" nominal pipe size						
WP25	2.5" nominal pipe size						
WP30	3" nominal pipe size						
WP35	3.5" nominal pipe size						
WP40	4" nominal pipe size						



## WASHER STYLE WITH LEADWIRE

### How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	WASHER SIZE	WASHER MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-16b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)** (see page 2-16b for restrictions)

### ASSEMBLY STYLE

**32 – Washer with leadwire;** Teflon® insulated conductors; armor cable; washer thickness 3/16" (0.188"); Sheath diameter 0.188" only

### WASHER SIZE (in inches)

	Washer	
	ID	OD
<b>6</b> – 3/16 (0.188)	0.193	0.375
<b>7</b> – 1/4 (0.250)	0.255	0.500
<b>9</b> – 3/8 (0.375)	0.380	0.750
<b>10</b> – 1/2 (0.500)	0.510	1.000

### WASHER MATERIAL

**3** – stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

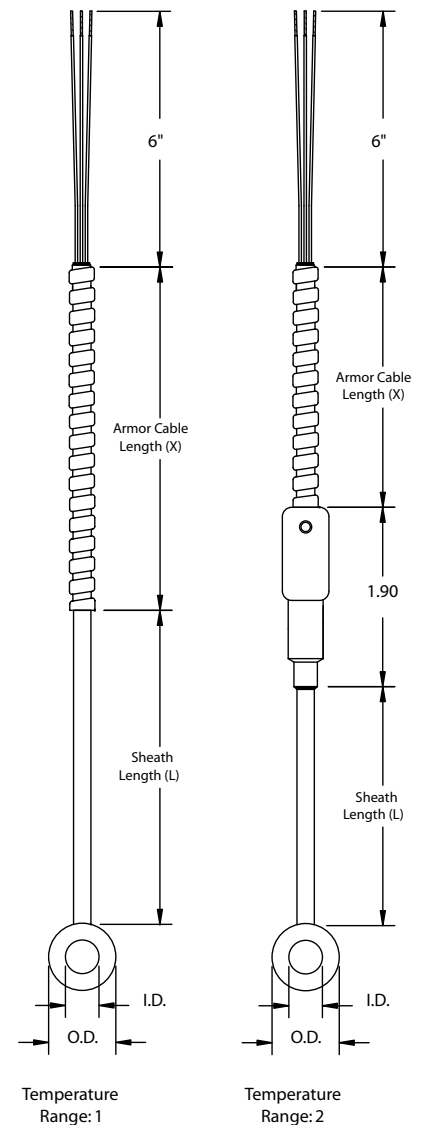
**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

### LEADWIRE LENGTH

**X#** – (e.g., X6 = 6 inch length)

**OPTIONS** – see page 2-16b



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## STYLE 32

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)
WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
BX CONNECTORS	
WC40	1/2"
WC50	3/4"

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6). Dual available on 2 and 3-wire constructions only. 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		

## **MOUNTING LUG WITH LEADWIRE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	LUG HOLE SIZE	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-17b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**41** – Stainless steel mounting lug with Teflon® leadwire; diameter 0.312" only

**LUG HOLE SIZE** (in inches)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

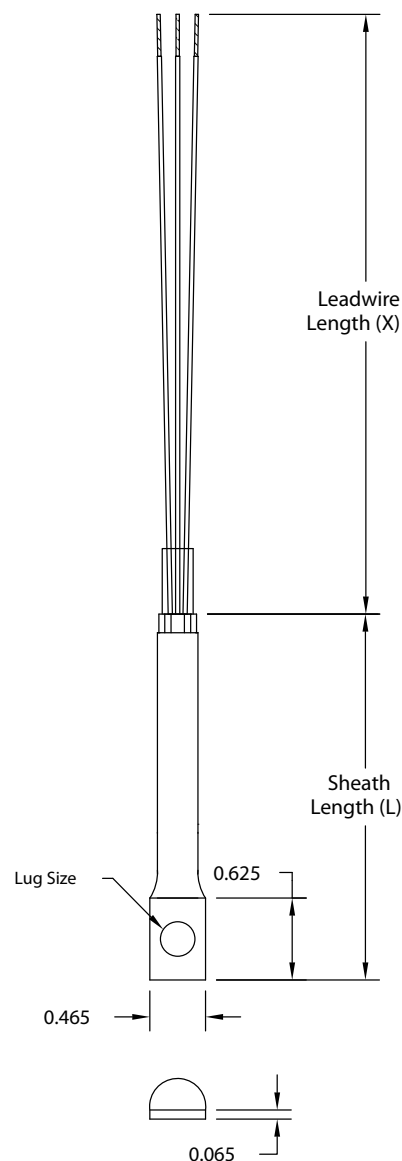
**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

### **LEADWIRE LENGTH**

**X#** – (e.g., X72 = 72 inch length)

**OPTIONS** – see page 2-17b



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## STYLE 41

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		

## **SHEATH WITH LEADWIRE AND PROTECTIVE TEFLON® SLEEVE**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	TEFLON® SLEEVE	LEADWIRE LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-18b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D"- e.g., DRTP1)**

### **ASSEMBLY STYLE**

**42 – Sheath with protective Teflon® sleeve;** Teflon® insulated leadwire extension beyond Teflon® sleeve

**SHEATH DIAMETER** (in inches) (see page 2-18b for restrictions)

**6** – 3/16 (0.188) Finished OD = 0.240

**7** – 1/4 (0.250) Finished OD = 0.300

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

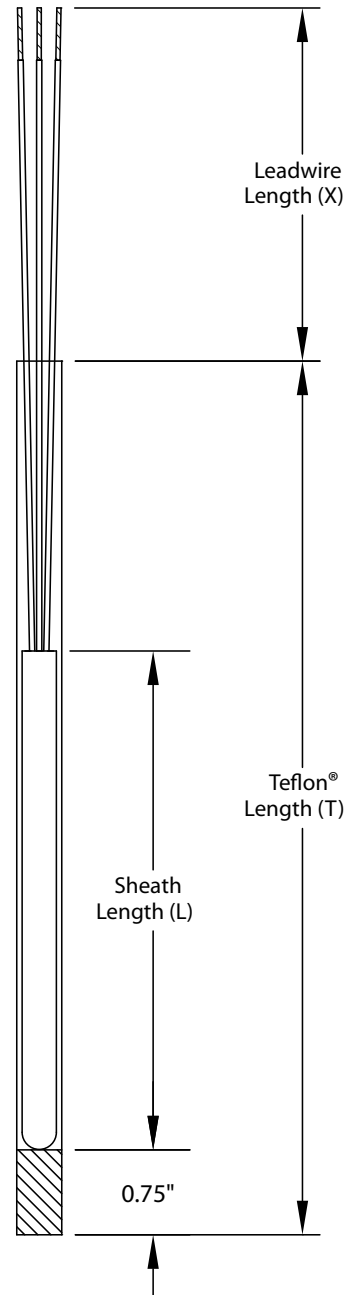
### **TEFLON® SLEEVE**

**T#** – (e.g., T12 = 12" of Teflon®)

### **LEADWIRE LENGTH**

**X#** – (e.g., X12.5 = 12.5 inch length beyond Teflon® sleeve)

**OPTIONS** – see page 2-18b



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## STYLE 42

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
<b>PLUGS AND JACKS</b> (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177 °C (350 °F)	
PJ20	Standard jack, rated to 177 °C (350 °F)	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0 °C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	3/16	3/16	3/16	3/16	3/16	3/16	3/16
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16	1/4	1/4	1/4

## **ATEX APPROVED CONNECTION HEAD WITH WELDED PROCESS CONNECTION**

### **How to build a part number:**

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

**SENSOR TYPE** (See page 2-3b for optional elements)

**RTP1** – Platinum; DIN 0.00385; 100 ohm  $\pm 0.12\%$  @ 0°C; 3-wire construction

**(For dual element, add prefix "D" - e.g., DRTP1)**

### **ASSEMBLY STYLE**

**22 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection;** head ATEX approved for EEx d IIC; IP66 to 68; screw cover with chain and gasketed o-ring; meets NEMA 4X; ceramic terminal block; 3/4" NPT conduit connection; internal and external ground screws (Note: For spring-loaded fitting, see Style 75 and add optional head).

**SHEATH DIAMETER** (in inches) (see page 2-3b for restrictions)

**4** – 1/8 (0.125)

**6** – 3/16 (0.188)

**7** – 1/4 (0.250)

**9** – 3/8 (0.375)

### **SHEATH MATERIAL**

**3** – 316 stainless steel

**TEMPERATURE RANGE** - Minimum and maximum operating temperatures

**1** – -45 to 260°C (-50 to 500°F)

**2** – -45 to 482°C (-50 to 900°F)

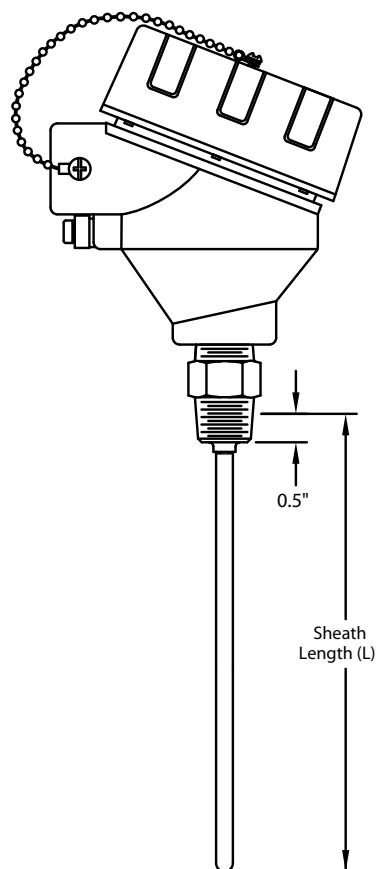
**3** – -45 to 788°C (-50 to 1450°F)

**4** – -200 to 260°C (-328 to 500°F)

**SHEATH LENGTH** (for lengths greater than L=36", consult AST)

**L#** – (e.g., L6 = 6 inch sheath)

**OPTIONS** – see page 2-19b



## STYLE 22

### AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
PC25	1/4" NPT process connection	
PC75	3/4" NPT process connection	
CAL1	Calibration, NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	<b>±0.06%</b>	3-wire
RTP1AA	<b>±0.01%</b>	3-wire
RTP6	±0.12%	<b>2-wire</b>
RTP7	±0.12%	<b>4-wire</b>
RTP7A	<b>±0.06%</b>	<b>4-wire</b>
RTP7AA	<b>±0.01%</b>	<b>4-wire</b>
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
TRANSMITTERS – For complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C)	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

EXPLOSION-PROOF TERMINAL HEAD OPTIONS							
Option Code		Process Connection			Conduit Connection		
Same specifications as standard							
HD72		1/2"			1/2"		
Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			



## BAR STOCK, NPT CONNECTION, NO LAG

### How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	WELL MATERIAL	OPTIONS

#### PROCESS CONNECTION (P)

- 1 – 1/2" NPT
- 2 – 3/4" NPT
- 3 – 1" NPT
- 5 – 1-1/2" NPT

#### STYLE

- S – Stepped stem (0.260" bore only; for straight stem, see Options)
- H – Tapered stem

#### BORE

- 260 – 0.260" bore
- 385 – 0.385" bore

#### WELL LENGTH (in inches)\*

L# – Specify length of thermowell (e.g., L4=4")

Standard lengths:

- L4 – L=4"; U=2.5"
- L6 – L=6"; U=4.5"
- L9 – L=9"; U=7.5"
- L12 – L=12"; U=10.5"
- L15 – L=15"; U=13.5"
- L18 – L=18"; U=16.5"
- L24 – L=24"; U=22.5"

Specify other (L = U + 1.5")

#### WELL MATERIAL

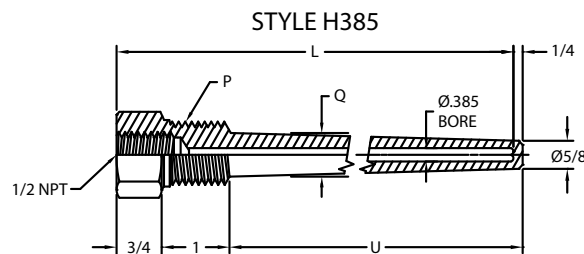
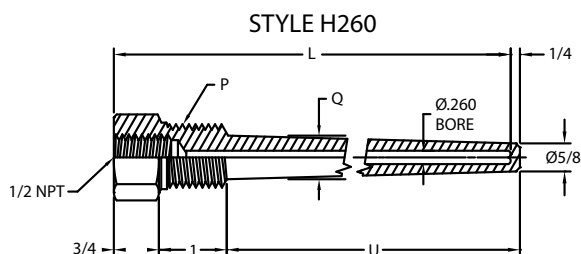
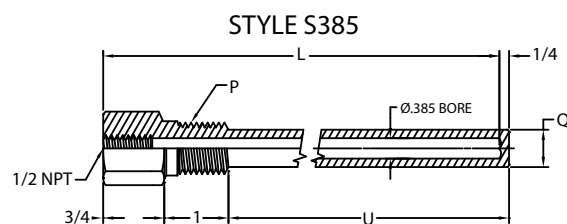
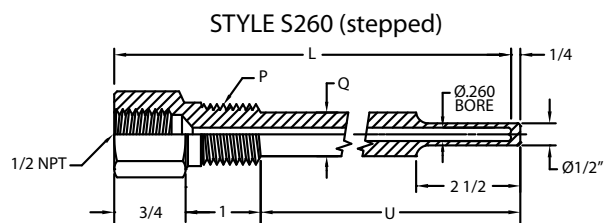
- – 304 stainless steel
- 310 – 310 stainless steel
- 316 – 316 stainless steel
- INC – Inconel 600®
- 321 – 321 stainless steel
- ALUM – Aluminum
- HAST – Hastelloy C®
- TTNM – Titanium
- 316L – 316L stainless steel
- 400 – Monel 400®
- CS – Carbon steel
- F11 – F11 carbon steel (forged)
- F22 – F22 carbon steel (forged)
- F91 – F91 carbon steel (forged)
- A20 – Alloy 20
- BRASS – Brass

#### OPTIONS

- TW01 – Stainless steel cap and chain assembly
- TW02 – Brass cap and chain assembly
- TAG2 – Stamped tag #
- STRT – Straight stem
- MTR1 – Material Test Report
- WFC1 – Wake Frequency Calculation

#### Root Diameter (Q)

Process Connection =	1/2" NPT	3/4" NPT	1" NPT	1-1/2" NPT
S260 and S385	.63"	.75"	.88"	.88"
H260 and H385	.63"	.88"	1.06"	1.63"



(\*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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## BAR STOCK, NPT CONNECTION WITH LAG

### How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	LAG EXTENSION	WELL MATERIAL	OPTIONS

#### PROCESS CONNECTION (P)

- 1 – 1/2" NPT
- 2 – 3/4" NPT
- 3 – 1" NPT
- 5 – 1-1/2" NPT

#### STYLE

**SL** – NPT connection, stepped stem with lag extension (for straight stem, see Options)

**HL** – NPT connection, tapered stem, with lag extension

#### BORE

**260** – 0.260" bore

**385** – 0.385" bore

#### WELL LENGTH (in inches)\*

**L#** – Specify length of thermowell (e.g., L9=9")

Standard lengths:

	Length (L) =	U =	
		If T = 2"	If T = 3"
<b>L6</b>	6"	2.5"	1.5"
<b>L9</b>	9"	5.5"	4.5"
<b>L12</b>	12"	8.5"	7.5"
<b>L15</b>	15"	11.5"	10.5"
<b>L18</b>	18"	14.5"	13.5"
<b>L24</b>	24"	20.5"	19.5"

Specify other (L = U+T+1.5")

#### LAG EXTENSION (in inches)

**T#** – Specify length of lagging (e.g., T2 = 2" lag)

**T2** – 2"    **T3** – 3"

Specify other

#### WELL MATERIAL

--- – 304 stainless steel

**310** – 310 stainless steel

**316** – 316 stainless steel

**INC** – Inconel 600®

**321** – 321 stainless steel

**ALUM** – Aluminum

**HAST** – Hastelloy C®

**TTNM** – Titanium

**316L** – 316L stainless steel

**400** – Monel 400®

**CS** – Carbon steel

**F11** – F11 carbon steel (forged)

**F22** – F22 carbon steel (forged)

**F91** – F91 carbon steel (forged)

**A20** – Alloy 20

**BRASS** – Brass

#### OPTIONS

**TW01** – Stainless steel cap and chain assembly

**TW02** – Brass cap and chain assembly

**TAG2** – Stamped tag #

**STRT** – Straight stem

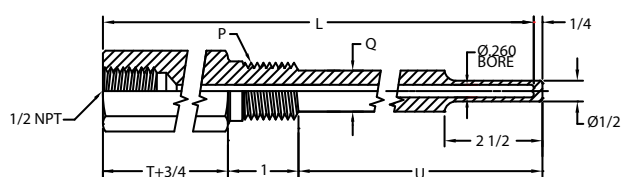
**MTR1** – Material Test Report

**WFC1** – Wake Frequency Calculation

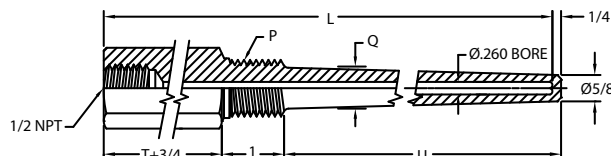
Root Diameter (Q)

Process Connection =	1/2" NPT	3/4" NPT	1" NPT	1-1/2" NPT
SL260 and SL385	.63"	.75"	.88"	.88"
HL260 and HL385	.68"	.88"	1.06"	1.63"

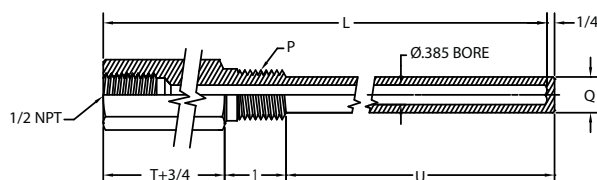
STYLE SL260



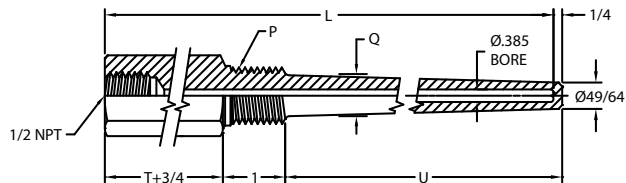
STYLE HL260



STYLE SL385



STYLE HL385



(\*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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## **BAR STOCK, NPT CONNECTION, LIMITED SPACE**

### **How to build a part number:**

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL MATERIAL	OPTIONS

#### **PROCESS CONNECTION (P)**

- 1** – 1/2" NPT
- 2** – 3/4" NPT
- 3** – 1" NPT

#### **STYLE**

**LS** – Limited space, straight stem

#### **BORE**

- 260** – 0.260" bore
- 385** – 0.385" bore

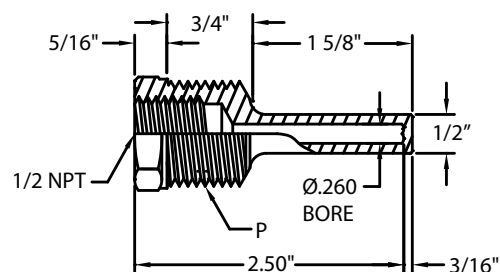
#### **WELL MATERIAL**

- |                                  |  |
|----------------------------------|--|
| --- – 304 stainless steel        | <b>316L</b> – 316L stainless steel     |
| <b>310</b> – 310 stainless steel | <b>400</b> – Monel 400®                |
| <b>316</b> – 316 stainless steel | <b>CS</b> – Carbon steel               |
| <b>INC</b> – Inconel 600®        | <b>F11</b> – F11 carbon steel (forged) |
| <b>321</b> – 321 stainless steel | <b>F22</b> – F22 carbon steel (forged) |
| <b>ALUM</b> – Aluminum           | <b>F91</b> – F91 carbon steel (forged) |
| <b>HAST</b> – Hastelloy C®       | <b>A20</b> – Alloy 20                  |
| <b>TTNM</b> – Titanium           | <b>BRASS</b> – Brass                   |

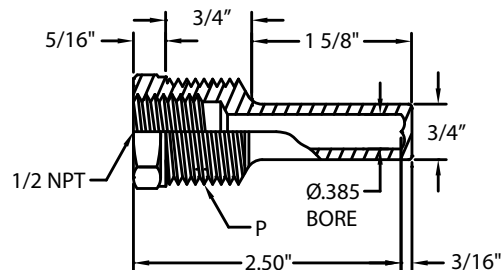
#### **OPTIONS**

- TW01** – Stainless steel cap and chain assembly
- TW02** – Brass cap and chain assembly
- TAG2** – Stamped tag #
- MTR1** – Material Test Report

**STYLE LS260**



**STYLE LS385**



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## BAR STOCK, FLANGE CONNECTION

### How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	BORE	INSERTION LENGTH	WELL & FLANGE MATERIAL	FLANGE SIZE	FLANGE RATING	FLANGE TYPE	OPTIONS

#### STYLE

**F** – Flanged connection, stepped stem (for straight stem, see Options)

**FH** – Flanged connection, tapered stem

#### BORE

**260** – 0.260" bore

**385** – 0.385" bore

#### INSERTION LENGTH (in inches)\*

**U#** – Specify length below the flange (e.g., U4 = 4")

Standard lengths:

**U4** – U=4"; L=6"

**U7** – U=7"; L=9"

**U10** – U=10"; L=12"

**U13** – U=13"; L=15"

**U16** – U=16"; L=18"

**U22** – U=22"; L=24"

Specify other (L = U + 2")

#### WELL AND FLANGE MATERIAL

--- 304 stainless steel

**310** – 310 stainless steel

**316** – 316 stainless steel

**INC** – Inconel 600®

**321** – 321 stainless steel

**ALUM** – Aluminum

**HAST** – Hastelloy C®

**TTNM** – Titanium

**316L** – 316L stainless steel

**400** – Monel 400®

**CS** – Carbon steel

**F11** – F11 carbon steel (forged)

**F22** – F22 carbon steel (forged)

**F91** – F91 carbon steel (forged)

**A20** – Alloy 20

**BRASS** – Brass

#### FLANGE SIZE

**1** – 1" flange

**1.5** – 1.5" flange

**2** – 2" flange

**3** – 3" flange

**4** – 4" flange

#### FLANGE RATING

**150** – 150# rating

**300** – 300# rating

**600** – 600# rating

**900/1500** – 900/1500# rating

#### FLANGE TYPE

**RF** – Welded, raised face (standard)

**FF** – Welded, flat face

**RTJ** – Ring type joint

#### OPTIONS

**TW01** – Stainless steel cap and chain assembly

**TW02** – Brass cap and chain assembly

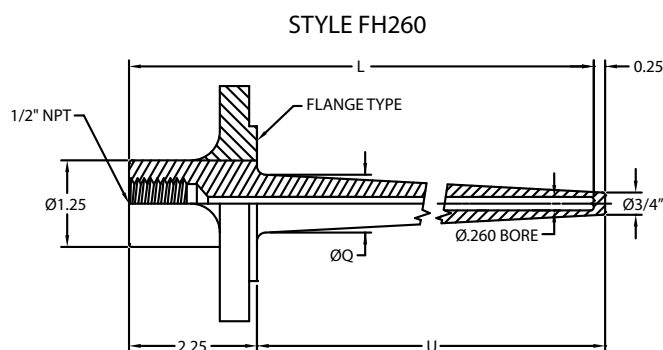
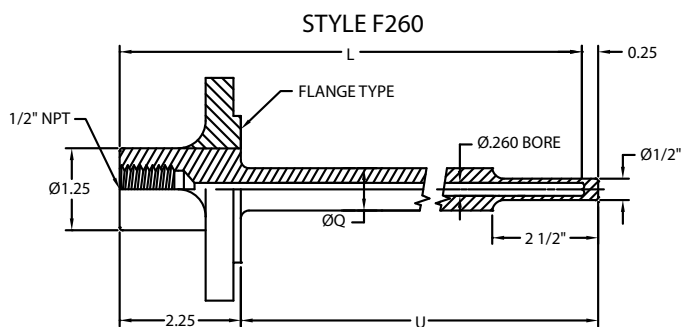
**TAG2** – Stamped tag #

**STRT** – Straight stem

**MTR1** – Material Test Report

**WFC1** – Wake Frequency Calculation

**TFLN** – Teflon sleeve or coating



	Root Diameter (Q)
F260	0.75"
F385	0.75"
FH260 & 385	1" flange = .88" 1.5" flange = 1.06" All others = 1.25"

(\*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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## BAR STOCK, SOCKET-WELD CONNECTION, NO LAG

### How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	WELL MATERIAL	OPTIONS

#### PROCESS CONNECTION (P)

- 2 – 3/4" pipe (OD = 1.05")  
3 – 1" pipe (OD = 1.315")  
5 – 1-1/2" pipe (OD = 1.90")

#### STYLE

**SW** – Socket-weld connection, stepped stem, no lag (for straight stem, see Options)

**SWH** – Socket-weld connection, tapered stem, no lag

#### BORE

- 260** – 0.260" bore  
**385** – 0.385" bore

#### WELL LENGTH (in inches)\*

**L#** – Specify length of thermowell (e.g., L4 = 4")

Standard lengths:

- |                             |                             |
|-----------------------------|-----------------------------|
| <b>L4</b> – L=4"; U=2.5"    | <b>L6</b> – L=6"; U=4.5"    |
| <b>L9</b> – L=9"; U=7.5"    | <b>L12</b> – L=12"; U=10.5" |
| <b>L15</b> – L=15"; U=13.5" | <b>L18</b> – L=18"; U=16.5" |
| <b>L24</b> – L=24"; U=22.5" |                             |

Specify other (L = U+1.5")

#### WELL MATERIAL

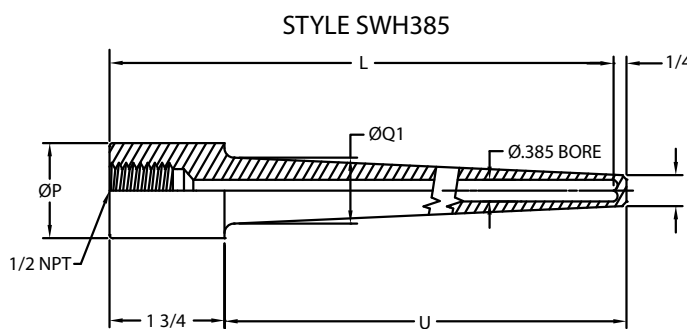
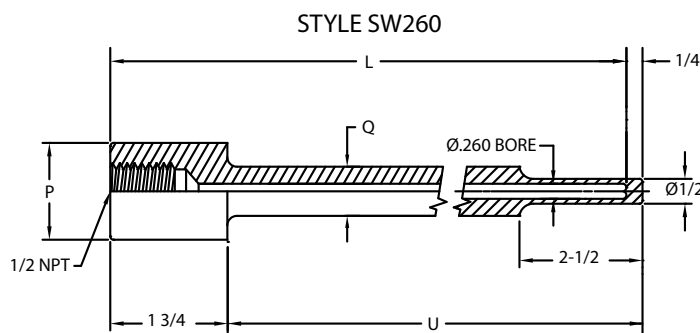
- |                                  |  |
|----------------------------------|--|
| --- – 304 stainless steel        | <b>316L</b> – 316L stainless steel     |
| <b>310</b> – 310 stainless steel | <b>400</b> – Monel 400®                |
| <b>316</b> – 316 stainless steel | <b>CS</b> – Carbon steel               |
| <b>INC</b> – Inconel 600®        | <b>F11</b> – F11 carbon steel (forged) |
| <b>321</b> – 321 stainless steel | <b>F22</b> – F22 carbon steel (forged) |
| <b>ALUM</b> – Aluminum           | <b>F91</b> – F91 carbon steel (forged) |
| <b>HAST</b> – Hastelloy C®       | <b>A20</b> – Alloy 20                  |
| <b>TTNM</b> – Titanium           | <b>BRASS</b> – Brass                   |

#### OPTIONS

- TW01** – Stainless steel cap and chain assembly  
**TW02** – Brass cap and chain assembly  
**TAG2** – Stamped tag #  
**STRT** – Straight stem  
**MTR1** – Material Test Report  
**WFC1** – Wake Frequency Calculations

Root Diameter (Q)

Process Connection =	3/4" pipe	1" pipe	1.5" pipe
SW260 & 385	.75"	.88"	1.13"
SWH260 & 385	.75"	1.00"	1.25"
SWH Tip Diameter	.63"	.75"	.75"



(\*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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## BAR STOCK, SOCKET-WELD CONNECTION WITH LAG

### How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	LAG EXTENSION	WELL MATERIAL	OPTIONS

#### PROCESS CONNECTION (P)

**2** – 3/4" pipe (OD = 1.05")

**3** – 1" pipe (OD = 1.315")

**5** – 1-1/2" pipe (OD = 1.90")

#### STYLE

**SWL** – Socket-weld connection, stepped stem, no lag (for straight stem, see Options)

**SWLH** – Socket-weld connection, tapered stem, no lag

#### BORE

**260** – 0.260" bore

**385** – 0.385" bore

#### WELL LENGTH (in inches)\*

**L#** – Specify length of thermowell (e.g., L9 = 9")

Standard lengths:

	Length (L) =	U =	
		If T = 2"	If T = 3"
<b>L6</b>	6"	2.5"	1.5"
<b>L9</b>	9"	5.5"	4.5"
<b>L12</b>	12"	8.5"	7.5"
<b>L15</b>	15"	11.5"	10.5"
<b>L18</b>	18"	14.5"	13.5"
<b>L24</b>	24"	20.5"	19.5"

Specify other (L = U+T+1.5")

#### LAG EXTENSION (in inches)

**T#** – Specify length of lagging (e.g., T2=2" lag)

**T2** – 2"    **T3** – 3"    Specify other

#### WELL MATERIAL

--- – 304 stainless steel

**310** – 310 stainless steel

**316** – 316 stainless steel

**INC** – Inconel 600®

**321** – 321 stainless steel

**ALUM** – Aluminum

**HAST** – Hastelloy C®

**TTNM** – Titanium

**316L** – 316L stainless steel

**400** – Monel 400®

**CS** – Carbon steel

**F11** – F11 carbon steel (forged)

**F22** – F22 carbon steel (forged)

**F91** – F91 carbon steel (forged)

**A20** – Alloy 20

**BRASS** – Brass

#### OPTIONS

**TW01** – Stainless steel cap and chain assembly

**TW02** – Brass cap and chain assembly

**MTR1** – Material Test Report

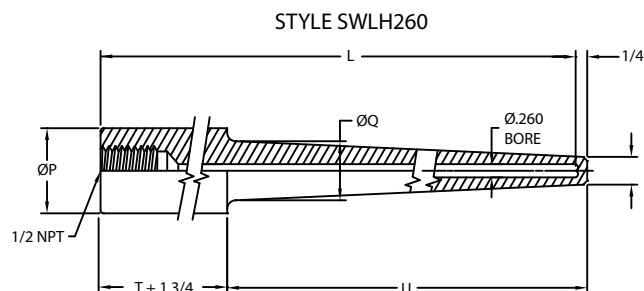
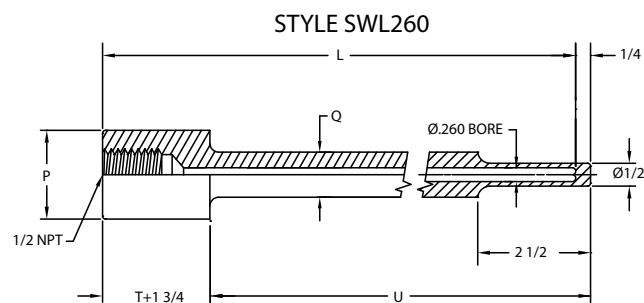
**TAG2** – Stamped tag #

**WFC1** – Wake Frequency Calculations

**STRT** – Straight stem

Root Diameter (Q)

Process Connection =	3/4" pipe	1" pipe	1.5" pipe
SWL260 & 385	.75"	.88"	1.25"
SWLH260 & 385	.75"	1.00"	1.25"
SWLH Tip Diameter	.63"	.75"	.75"



(\*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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## **BAR STOCK, WELD-IN CONNECTION, NO LAG**

### **How to build a part number:**

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	WELL MATERIAL	OPTIONS

#### **PROCESS CONNECTION (P)**

- 2** – 3/4" pipe (OD = 1.05")  
**3** – 1" pipe (OD = 1.315")  
**5** – 1-1/2" pipe (OD = 1.90")

#### **STYLE**

**WIH** – Weld-in, tapered stem, no lag

#### **BORE**

- 260** – 0.260" bore  
**385** – 0.385" bore

#### **WELL LENGTH** (in inches)\*

**L#** – Specify length of thermowell (e.g., L4 = 4")

Standard lengths:

- |                             |                             |
|-----------------------------|-----------------------------|
| <b>L4</b> – L=4"; U=2.5"    | <b>L6</b> – L=6"; U=4.5"    |
| <b>L9</b> – L=9"; U=7.5"    | <b>L12</b> – L=12"; U=10.5" |
| <b>L15</b> – L=15"; U=13.5" | <b>L18</b> – L=18"; U=16.5" |
| <b>L24</b> – L=24"; U=22.5" |                             |

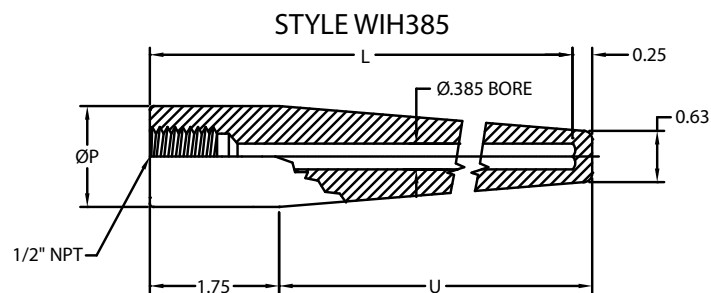
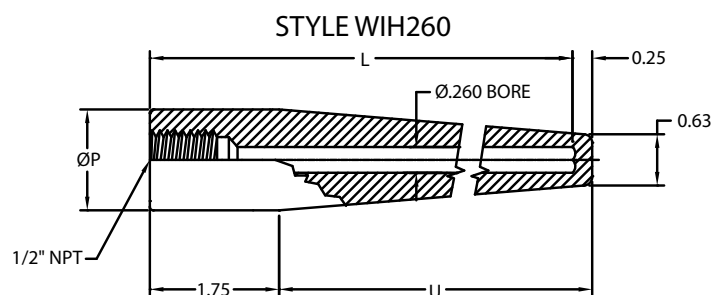
Specify other (L = U+1.5")

#### **WELL MATERIAL**

- |                                  |  |
|----------------------------------|--|
| --- – 304 stainless steel        | <b>316L</b> – 316L stainless steel     |
| <b>310</b> – 310 stainless steel | <b>400</b> – Monel 400®                |
| <b>316</b> – 316 stainless steel | <b>CS</b> – Carbon steel               |
| <b>INC</b> – Inconel 600®        | <b>F11</b> – F11 carbon steel (forged) |
| <b>321</b> – 321 stainless steel | <b>F22</b> – F22 carbon steel (forged) |
| <b>ALUM</b> – Aluminum           | <b>F91</b> – F91 carbon steel (forged) |
| <b>HAST</b> – Hastelloy C®       | <b>A20</b> – Alloy 20                  |
| <b>TTNM</b> – Titanium           | <b>BRASS</b> – Brass                   |

#### **OPTIONS**

- TW01** – Stainless steel cap and chain assembly  
**TW02** – Brass cap and chain assembly  
**TAG2** – Stamped tag #  
**MTR1** – Material Test Report  
**WFC1** – Wake Frequency Calculations



(\*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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## **BAR STOCK, WELD-IN CONNECTION WITH LAG**

### **How to build a part number:**

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	LAG EXTENSION	WELL MATERIAL	OPTIONS

### **PROCESS CONNECTION (P)**

- 2 – 3/4" pipe (OD = 1.05")  
3 – 1" pipe (OD = 1.315")  
5 – 1-1/2" pipe (OD = 1.90")

### **STYLE**

**WIHL** – Weld-in, tapered stem with lag extension

### **BORE**

- 260** – 0.260" bore  
**385** – 0.385" bore

### **WELL LENGTH** (in inches)\*

**L#** – Specify length of thermowell (e.g., L9 = 9")

Standard lengths:

	Length (L) =	U =	
		If T = 2"	If T = 3"
<b>L6</b>	6"	2.5"	1.5"
<b>L9</b>	9"	5.5"	4.5"
<b>L12</b>	12"	8.5"	7.5"
<b>L15</b>	15"	11.5"	10.5"
<b>L18</b>	18"	14.5"	13.5"
<b>L24</b>	24"	20.5"	19.5"

Specify other (L = U+T+1.5")

### **LAG EXTENSION (in inches)**

**T#** – Specify length of lagging (e.g., T2=2" lag)

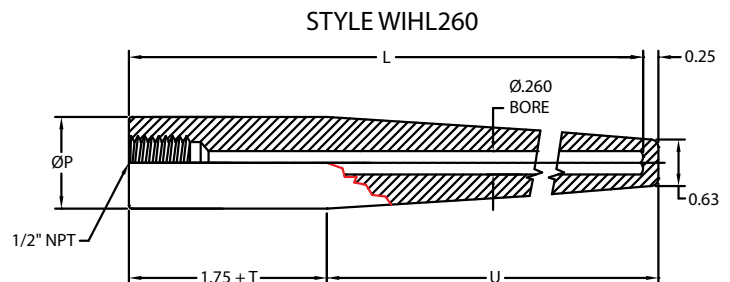
**T2** – 2"    **T3** – 3"    **Specify other**

### **WELL MATERIAL**

- |                                  |  |
|----------------------------------|--|
| --- – 304 stainless steel        | <b>316L</b> – 316L stainless steel     |
| <b>310</b> – 310 stainless steel | <b>400</b> – Monel 400®                |
| <b>316</b> – 316 stainless steel | <b>CS</b> – Carbon steel               |
| <b>INC</b> – Inconel 600®        | <b>F11</b> – F11 carbon steel (forged) |
| <b>321</b> – 321 stainless steel | <b>F22</b> – F22 carbon steel (forged) |
| <b>ALUM</b> – Aluminum           | <b>F91</b> – F91 carbon steel (forged) |
| <b>HAST</b> – Hastelloy C®       | <b>A20</b> – Alloy 20                  |
| <b>TTNM</b> – Titanium           | <b>BRASS</b> – Brass                   |

### **OPTIONS**

- TW01** – Stainless steel cap and chain assembly  
**TW02** – Brass cap and chain assembly  
**TAG2** – Stamped tag #  
**MTR1** – Material Test Report  
**WFC1** – Wake Frequency Calculations



(\*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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## BAR STOCK, VAN STONE FLANGE CONNECTION

### How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	INSERTION LENGTH	WELL MATERIAL	FLANGE MATERIAL	FLANGE RATING	OPTIONS

#### PROCESS CONNECTION (P)

**3** – 1" pipe (OD = 1.315", R = 2")

**5** – 1-1/2" pipe (OD = 1.90", R = 2-7/8")

#### STYLE

**VS** – Van Stone Flange, straight stem with step

#### BORE

**260** – 0.260" bore (Q = 3/4")

**385** – 0.385" bore (Q = 7/8")

#### INSERTION LENGTH (in inches)\*

**U#** – Specify length below the flange (e.g., U4 = 4")

Standard lengths:

**U2** – U=2"; L=4"

**U4** – U=4"; L=6"

**U7** – U=7"; L=9"

**U10** – U=10"; L=12"

**U13** – U=13"; L=14"

**U16** – U=16"; L=18"

**U22** – U=22"; L=24"

Specify other (U = L-2")

#### WELL MATERIAL

--- – 304 stainless steel

**310** – 310 stainless steel

**316** – 316 stainless steel

**INC** – Inconel 600®

**321** – 321 stainless steel

**ALUM** – Aluminum

**HAST** – Hastelloy C®

**TTNM** – Titanium

**316L** – 316L stainless steel

**400** – Monel 400®

**CS** – Carbon steel

**F11** – F11 carbon steel (forged)

**F22** – F22 carbon steel (forged)

**F91** – F91 carbon steel (forged)

**A20** – Alloy 20

**BRASS** – Brass

#### FLANGE MATERIAL

**304** – 304 stainless steel

**316** – 316 stainless steel

#### FLANGE RATING

**150** – 150# rating

**300** – 300# rating

**600** – 600# rating

**900/1500** – 900/1500# rating

#### OPTIONS

**TW01** – Stainless steel cap and chain assembly

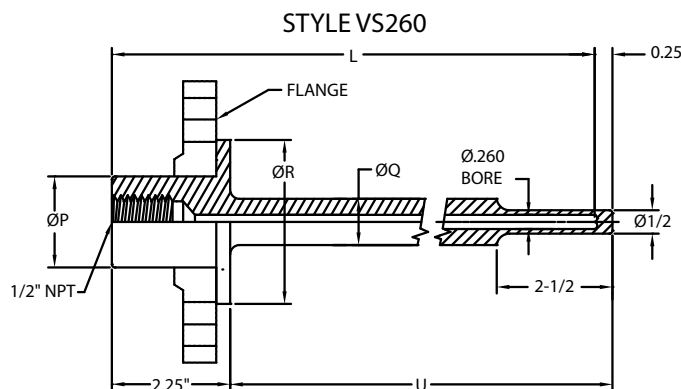
**TW02** – Brass cap and chain assembly

**TAG2** – Stamped tag #

**MTR1** – Material Test Report

**WFC1** – Wake Frequency Calculations

**TFLN** – Teflon coating



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## **CERAMIC TUBE, NO MOUNTING FITTING**

### **How to build a part number:**

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	TUBE DIAMETER	TUBE MATERIAL	LENGTH

#### **STYLE**

**CT1** – Ceramic protection tube, no mounting fitting

#### **TUBE DIAMETER**

##### **O.D.**

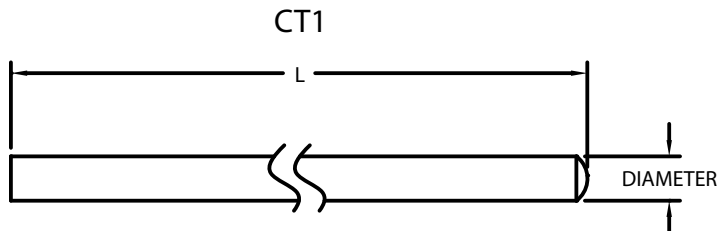
- 0** – 0.375"
- 1** – 0.5"
- 2** – 0.688"
- 3** – 0.75"
- 4** – 0.875"
- 5** – 1"
- 6** – 1.1"
- 7** – 1.25"
- 8** – 1.5"
- 9** – 1.75"

#### **TUBE MATERIAL**

- A** – Alumina
- M** – Mullite – not recommended for noble metal thermocouples
- H** – Hexalloy
- L** – LT-1
- S** – Sialon
- C** – Silicon carbide, oxide bonded

#### **LENGTH (in inches)**

**L#** – Specify length (e.g., L6 = 6" overall length)



## **CERAMIC TUBE, WITH MOUNTING FITTING OR NIPPLE**

### **How to build a part number:**

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	TUBE DIAMETER	TUBE MATERIAL	INSTRUMENT CONNECTION	PROCESS CONNECTION	CONNECTION MATERIAL	CONNECTION LENGTH	LENGTH

#### **STYLE**

**CT2** – Ceramic protection tube with threaded hex fitting

**CT3** – Ceramic protection tube with pipe nipple

#### **TUBE DIAMETER**

##### **O.D.**

- 0** – 0.375"
- 1** – 0.5"
- 2** – 0.688"
- 3** – 0.75"
- 4** – 0.875"
- 5** – 1"
- 7** – 1.25"

#### **TUBE MATERIAL**

- A** – Alumina
- M** – Mullite – not recommended for noble metal thermocouples
- H** – Hexalloy
- L** – LT-1

#### **INSTRUMENT CONNECTION\***

- 0** – 1/2" NPT
- 1** – 3/4" NPT
- 2** – 1" NPT
- 3** – 1-1/4" NPT

#### **PROCESS CONNECTION\***

- 0** – 1/2" NPT
- 1** – 3/4" NPT
- 2** – 1" NPT
- 3** – 1-1/4" NPT

#### **CONNECTION MATERIAL**

- 304** – 304 stainless steel
- 316** – 316 stainless steel
- CS** – Carbon steel

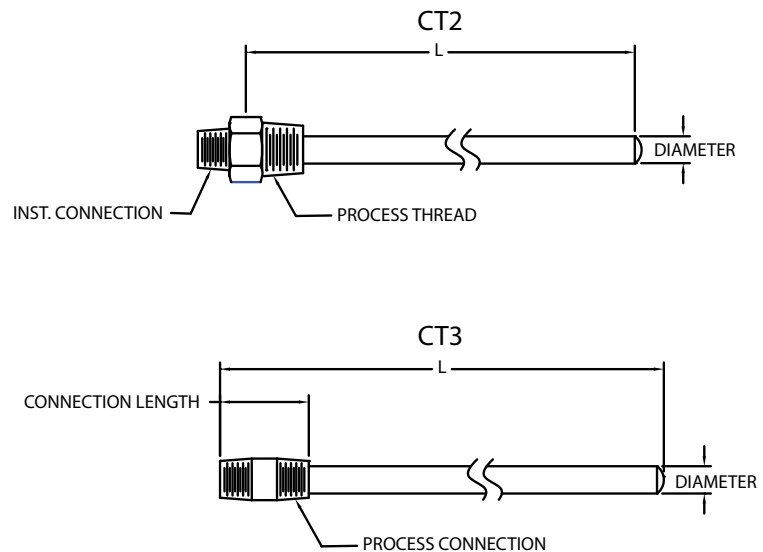
#### **CONNECTION LENGTH**

- 1** – CT2 only (hex fitting length)
- #** – CT3 only (length of nipple in inches; e.g., 6 = 6" nipple)

#### **LENGTH** (in inches)

**L#** – Specify length (For CT2, U is approximately L – 1"; for CT3, U is approximately L – the nipple length)

\*Note: For CT3, Instrument and Process Connection sizes must be the same.



## **METAL TUBE, PLAIN OR WITH MOUNTING BUSHING**

### **How to build a part number:**

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	PIPE SIZE/ INSTRUMENT CONNECTION	PIPE SCHEDULE	PIPE & BUSHING MATERIAL	BUSHING SIZE	OVERALL LENGTH	INSERTION LENGTH

#### **STYLE**

**MT1** – Metal protection tube, threaded, no bushing

**MT2** – Metal protection tube, threaded, with bushing

#### **PIPE SIZE/INSTRUMENT CONNECTION**

Pipe Size	Connection
<b>1</b> – 1/2" pipe (0.840" dia.)	1/2" NPT
<b>2</b> – 3/4" pipe (1.050" dia.)	3/4" NPT
<b>3</b> – 1" pipe (1.315" dia.)	1" NPT

#### **PIPE SCHEDULE**

**40** – Schedule 40

**80** – Schedule 80

**160** – Schedule 160

#### **PIPE AND BUSHING MATERIAL**

**304** – 304 stainless steel

**310** – 310 stainless steel

**316** – 316 stainless steel

**316L** – 316L stainless steel

**321** – 321 stainless steel

**A20** – Alloy 20

**INC** – Inconel 600®

**400** – Monel 400®

#### **BUSHING SIZE**

**1** – 1/2" NPT

**2** – 3/4" NPT

**3** – 1" NPT

**4** – 1-1/4" NPT

**5** – 1-1/2" NPT

**7** – 2" NPT

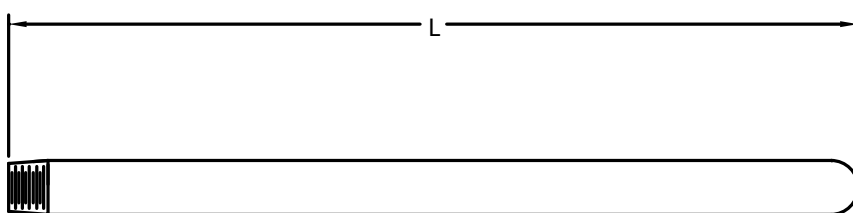
#### **OVERALL LENGTH** (in inches)

**L#** – Specify overall length of tube (e.g., L24 = 24" long tube)

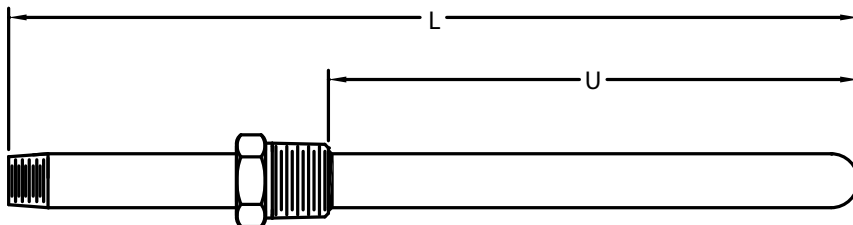
#### **INSERTION LENGTH** (MT2 only, in inches)

**U#** – Specify length below bushing connection (e.g., U6 = 6" below thread)

STYLE MT1



STYLE MT2



## **METAL TUBE WITH MOUNTING FLANGE**

### **How to build a part number:**

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	PIPE SIZE/ INSTRUMENT CONNECTION	PIPE SCHEDULE	PIPE & FLANGE MATERIAL	FLANGE SIZE	FLANGE RATING	FLANGE TYPE	OVERALL LENGTH	INSERTION LENGTH

#### **STYLE**

**MT4** – Metal protection tube, threaded, with flange

#### **PIPE SIZE/INSTRUMENT CONNECTION**

Pipe Size	Connection
<b>1</b> – 1/2" pipe (0.840" dia.)	1/2" NPT
<b>2</b> – 3/4" pipe (1.050" dia.)	3/4" NPT
<b>3</b> – 1" pipe (1.315" dia.)	1" NPT

#### **PIPE SCHEDULE**

**40** – Schedule 40  
**80** – Schedule 80  
**160** – Schedule 160

#### **PIPE AND FLANGE MATERIAL**

**304** – 304 stainless steel  
**310** – 310 stainless steel  
**316** – 316 stainless steel  
**316L** – 316L stainless steel  
**321** – 321 stainless steel  
**A20** – Alloy 20  
**INC** – Inconel 600®  
**400** – Monel 400®

#### **FLANGE SIZE**

**1** – 1" flange  
**1.5** – 1.5" flange  
**2** – 2" flange  
**3** – 3" flange  
**4** – 4" flange

#### **FLANGE RATING**

**150** – 150# flange rating  
**300** – 300# flange rating  
**600** – 600# flange rating  
**900/1500** – 900/1500# flange rating

#### **FLANGE TYPE**

**RF** – Raised face  
**FF** – Flat face  
**RTJ** – Ring type joint

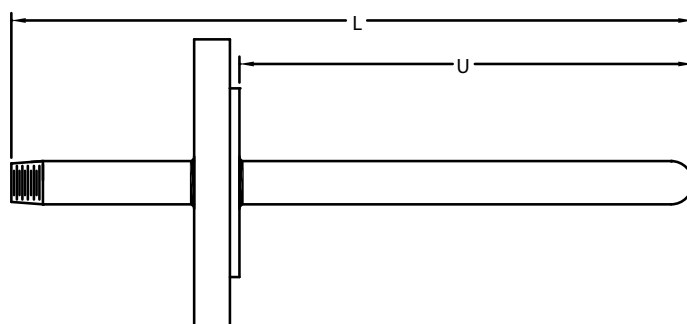
#### **OVERALL LENGTH** (in inches)

**L#** – Specify overall length of tube (e.g., L24 = 24" long tube)

#### **INSERTION LENGTH** (in inches)

**U#** – Specify length below flange (e.g., U6 = 6" below flange)

**STYLE MT4**



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## **SPECIAL SECONDARY (OUTER) TUBE WITH MOUNTING BUSHING**

### **How to build a part number:**

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	TUBE DIAMETER	TUBE MATERIAL	INSTRUMENT CONNECTION	PROCESS CONNECTION	BUSHING MATERIAL	OVERALL LENGTH

#### **STYLE**

**PT2** – Outer protection tube, with bushing, to be used with inner ceramic protection tube (Style CT2 or CT3)

#### **TUBE DIAMETER**

- 3** – 3/4" O.D.
- 4** – 7/8" O.D.
- 5** – 1" O.D.
- 6** – 1-1/10" O.D.
- 7** – 1-1/4" O.D.
- 8** – 1-1/2" O.D.
- 9** – 1-3/4" O.D.

#### **TUBE MATERIAL**

- SC** – Silicon carbide, oxide bonded
- SI** – Sialon
- HX** – Hexalloy
- LT** – LT1 metal ceramic

#### **INSTRUMENT CONNECTION**

- 0** – 1/2" NPT
- 1** – 3/4" NPT

#### **PROCESS CONNECTION**

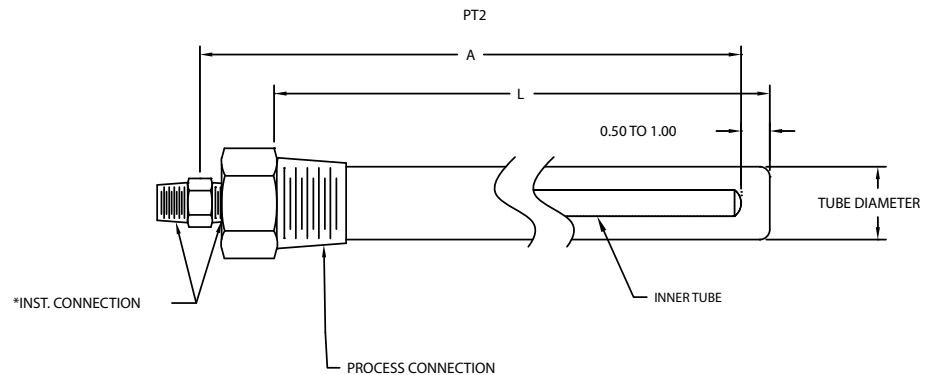
- 2** – 1" NPT
- 3** – 1-1/4" NPT
- 4** – 1-1/2" NPT
- 5** – 2" NPT

#### **BUSHING MATERIAL**

- C** – Carbon steel
- S** – 316 stainless steel

#### **OVERALL LENGTH** (in inches)

**L#** – Specify length of tube including threads  
(e.g., L24=24" long tube)



Use CT2/CT3 spec sheet to specify inner protection tube, using appropriate O.D. from chart below:

OUTER TUBE O.D.	INNER TUBE O.D.
3/4"	.375"
7/8"	.375"
1"	.375"
1.10"	.375"
1-1/4"	.688"
1-1/2"	.688"
1-3/4"	.75"

Note: to match inner tube length to outer, inner length (A) = outer tube length (L) + 0.75"

PROCESS THREAD (NPT)					
OUTER TUBE O.D.	CODE	2 (1")	3 (1-1/4")	4 (1-1/2")	5 (2")
	3 (3/4")	H	H	H	H
	4 (7/8")	L,S	L,S	L,S	L,S
	5 (1")		H	H	H
	6 (1-1/10")		S	S	S
	7 (1-1/4")			H	H
	8 (1-1/2")			H	H
	9 (1-3/4")				C

#### **Notes:**

- Not all materials and process thread sizes are compatible with all tubing O.D.'s. Use the chart below as a guide for the possible combinations. For each combination of thread and O.D., available materials are noted – Silicon Carbide (C), Sialon® (S), Hexalloy® (H) and LT1 (L).
- Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.

## **SPECIAL SECONDARY (OUTER) TUBE WITH MOUNTING FLANGE**

### **How to build a part number:**

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	TUBE DIAMETER	TUBE MATERIAL	SLIP FLANGE SIZE	OVERALL LENGTH

#### **STYLE**

**PT3** – Outer protection tube, with 4-7/8" mounting flange for mounting, to be used with inner ceramic protection tube (Style CT2 or CT3)

#### **TUBE DIAMETER**

**9** – 1-3/4" O.D.

#### **TUBE MATERIAL**

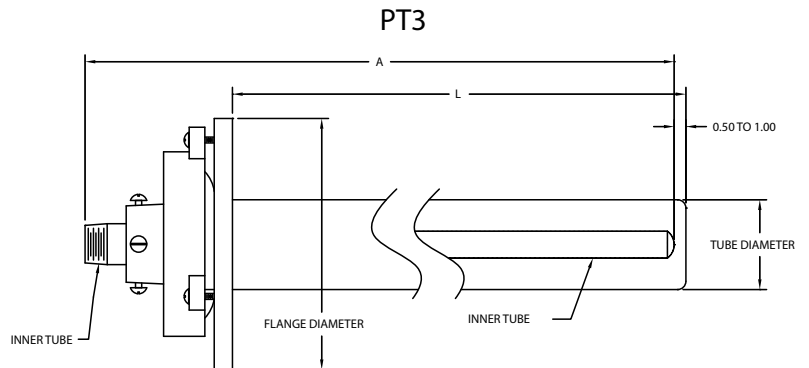
**SC** – Silicon carbide, oxide bonded

#### **SLIP FLANGE SIZE**

**5** – 4-7/8"

#### **OVERALL LENGTH** (in inches)

**L#** – Specify length of tube below flange  
(e.g., L24=24" long tube)



Notes – when inner protection tube is required:

1. Use CT2/CT3 spec sheet to specify inner tube.
2. Style should be CT3 with a 3/4" diameter to match up with 1-3/4" outer tube.
3. Minimum nipple length should be 4" in order to extend past the collar.
4. Length of inner tube (A) should be equal to outer tube length (L) + 2.5".
5. Applied Sensor Technologies recommends alumina inner protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.





## TEMPERATURE SENSOR ASSEMBLY SYSTEM FOR THE MAINTENANCE PROFESSIONAL

### How to build a part number:

The basic Sensor Box™, part number EK1000, comes complete with the common parts listed below, along with your choice of any 6 of the sensor pods listed on this page, e.g., "EK1000 with (3) RT1260, (1) MI1113JU and (2) MI1113KU."

### EK1000 Common Parts:

Part Number	Description	Quantity
HS2524	Housing, 0.250" O.D. x 24" long, 316 stainless steel	6
PH02	Aluminum terminal head for NEMA 4, 1/2" NPT process connection and 3/4" conduit connection with 4-post ceramic terminal block.	3
AC1087	Spring-loading kit for PH02 head	6
NC1002	Nipple, 1/2" NPT x 2" long, carbon steel	6
UC1011	Union, 1/2" NPT, carbon steel	3
TS1092	Wire guide grommet for housing	1 bag of 10
Tools:	Crimper, tube cutter, screwdriver, tape measure, wire stripper	1 each

### Standard Sensor Pods\* (pick 6, any combination)

Part Number	Description
RT1260	100-ohm platinum RTD, 3-wire, Teflon® insulation
RT1254	100-ohm platinum RTD, 3-wire, fiberglass insulation
MI1113_U	Ungrounded thermocouple, fiberglass leads, specify calibration (J, K, E, T) – e.g., MI1113JU
MI1113_G	Grounded thermocouple, fiberglass leads, specify calibration (J, K, E, T) – e.g., MI1113JG
MI1113TF_U	Ungrounded thermocouple, Teflon® leads, specify calibration (J, K, E, T) – e.g., MI1113TFJU
MI1113TF_G	Grounded thermocouple, Teflon® leads, specify calibration (J, K, E, T) – e.g., MI1113TFJG

### Options:

Many parts can be added to the basic EK1000 to address specific needs. See page 4-1b for a listing of additional parts.



### \*Notes:

- Standard pods are 4" long and have 48" leads; designed to fit into 0.250" housings.
- Pods with fiberglass leads are rated to 900°F; those with Teflon® leads are rated to 400°F.

RTD Sensor Pods (100-ohm, Class B, 0.00385 alpha with 48" leads)	
Part Number	Description
<i>Pods for 0.250" O.D. Housings</i>	
RT1254	3-wire, fiberglass insulation (std)
RT1260	3-wire, Teflon® insulation (std)
RT1257	4-wire, Teflon® insulation
RT1276	4-wire, fiberglass insulation
<i>Pods for 0.188" O.D. Housings</i>	
RT1184	3-wire, fiberglass insulation
RT1256	3-wire, Teflon® insulation
Thermocouple Sensor Pods* (standard limits of error with 48" leads)	
<i>Pods for 0.250" O.D. Housings</i>	
MI1113_U	Ungrounded junction, fiberglass insulation (specify J, K, E or T calibration; e.g., MI1113KU)
MI1113_G	Grounded junction, fiberglass insulation (specify J, K, E or T calibration; e.g., MI1113KG)
MI1113TF_U	Ungrounded junction, Teflon® insulation (specify J, K, E or T calibration; e.g., MI1113TFJU)
MI1113TF_G	Grounded junction, Teflon® insulation (specify J, K, E or T calibration; e.g., MI1113TFJG)
<i>Pods for 0.188" O.D. Housings</i>	
MI1115_U	Ungrounded junction, fiberglass insulation (specify J, K, E or T calibration; e.g., MI1115KU)
MI1115_G	Grounded junction, fiberglass insulation (specify J, K, E or T calibration; e.g., MI1115KG)
MI1115TF_U	Ungrounded junction, Teflon® insulation (specify J, K, E or T calibration; e.g., MI1115TFJU)
MI1115TF_G	Grounded junction, Teflon® insulation, 48" long (specify J, K, E or T calibration; e.g., MI1115TFJG)
*For dual element, specify as JJ, KK, EE or TT	
Housings (stainless steel, one closed end)	
HS2512	0.250" O.D. x 12" long
HS2524	0.250" O.D. x 24" long (std. with kit)
HS2536	0.250" O.D. x 36" long
HS2548	0.250" O.D. x 48" long
HS1812	0.188" O.D. x 12" long
HS1824	0.188" O.D. x 24" long
HS1836	0.188" O.D. x 36" long
HS1848	0.188" O.D. x 48" long
Compression Fittings	
<i>For 0.250" housings</i>	
PF65	1/4" NPT, 316 stainless steel body and ferrule
PF66	1/4" NPT, 316 stainless steel body; Teflon® ferrule
PF73	1/2" NPT, 316 stainless steel body and ferrule
PF74	1/2" NPT, 316 stainless steel body; Teflon® ferrule
<i>For 0.188" housings</i>	
PF55	1/4" NPT, 316 stainless steel body and ferrule
PF56	1/4" NPT, 316 stainless steel body; Teflon® ferrule
PF59	1/2" NPT, 316 stainless steel body and ferrule
PF60	1/2" NPT, 316 stainless steel body; Teflon® ferrule
Unions (1/2" NPT)	
UC1011	Carbon steel, ordinary location
US1011	Stainless steel, ordinary location
HF1091	Plated steel, explosion-proof

## THE SENSOR BOX™ EK1000

### AVAILABLE ACCESSORIES

Terminal Heads with 4-Post Terminal Block Included (1/2" NPT process conn.)		
Part Number	Conduit Connection	Description
PH01	1/2"	Aluminum, ordinary locations
PH02	3/4"	Aluminum, ordinary locations (Std. with kit)
PH04	1/2"	Cast iron, ordinary locations
PH05	3/4"	Cast iron, ordinary locations
PH23	3/4"	Black polypropylene, ordinary locations
PH24	3/4"	White polypropylene, ordinary locations
PH47	3/4"	316 stainless steel, ordinary locations
PH50	1/2"	Aluminum, explosion-proof, 3-post block
PH51	3/4"	Aluminum, explosion-proof, 3-post block
Terminal Blocks		
Part Number	Description	
PH44	4-post, ceramic	
PH48	3-post, ceramic, for PH50 and PH51 heads	
Carbon Steel Nipples (1/2" NPT)		
NC1001	1" long	
NC1002	2" long	
NC1003	3" long	
NC1004	4" long	
NC1006	6" long	
Stainless Steel Nipples (1/2" NPT)		
NS1001	1" long	
NS1002	2" long	
NS1003	3" long	
NS1004	4" long	
NS1006	6" long	
Spring-Loaded Kits		
AC1088	For 0.188" housings	
AC1087	For 0.250" housings	
Spring-Loaded Hex Fittings		
PF14	Stainless steel, for 0.250" housings	
PF13	Stainless steel, for 0.188" housings	
Plugs and Jacks		
PT05-	Thermocouple plug (specify J, K, E or T); e.g., PT05-J	
PT05-3	3-pin RTD plug	
PT06-	Thermocouple jack (specify J, K, E or T); e.g., PT06-K	
PT06-3	3-pin RTD jack	
PT10	Wire clamp	
B1250	Brass crimp insert, for 0.250" housings	
B1188	Brass crimp insert, for 0.188" housings	
Strain Reliefs (Bag of 10)		
TS1092	Nylon grommet for 0.250" housings	
TS1094	Teflon® strain relief for 0.188" housings	
Armor Cable Kit		
TS1093	3' stainless armor and adaptor for 0.250" housings	

Note: Pods with fiberglass insulation are rated to 900°F; those with Teflon® leads are rated to 400°F.

**Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements.**

## 4-20 MA OUTPUT, ISOLATED

### How to build a part number:

To order an Applied Sensor Technologies transmitter, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

TRANSMITTER TYPE	INPUT	RANGE	UNITS OF MEASURE	OPTION

#### TRANSMITTER TYPE\*

**UNI5-S** – Isolated transmitter with single 4-20mA output for terminal head mounting

UNI5-S

#### INPUT

**J** – J type thermocouple

**K** – K type thermocouple

**E** – E type thermocouple

**T** – T type thermocouple

**Pt100** – 100-ohm platinum RTD

**Pt250** – 250-ohm platinum RTD

**Pt500** – 500-ohm platinum RTD

**Pt1000** – 1000-ohm platinum RTD

**R** – R type thermocouple

**S** – S type thermocouple

**B** – B type thermocouple

**Ni100** – 100-ohm nickel RTD

**Ni500** – 500-ohm nickel RTD

**Ni1000** – 1000-ohm nickel RTD

**Cu10** – 10-ohm copper RTD

**Cu100** – 100-ohm copper RTD

**RANGE** (specify minimum and maximum values, e.g., 0-100)\*

# – **Minimum Range Value** (temperature value that equals 4 mA)

# – **Maximum Range Value** (temperature value that equals 20 mA)

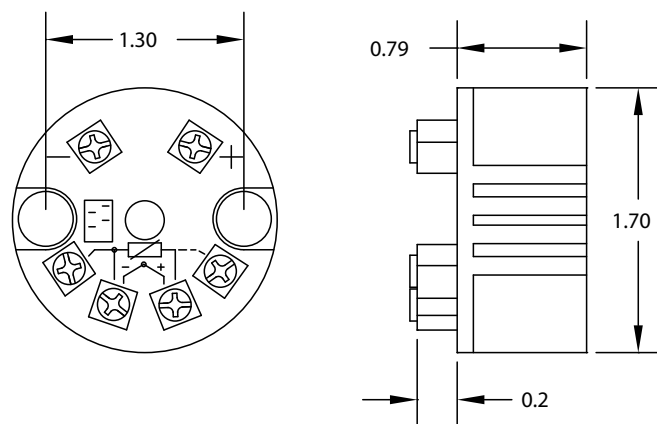
#### UNITS OF MEASURE

Specify °F or °C

#### OPTION

**DS01** – Downscale open circuit protection

\*See chart below for available sensor ranges and minimum spans



#### Specifications

Isolation (I/O):	500 VDC
Supply Voltage:	10-40 VDC, polarity protected
Sensor Lead Resistance:	RTD: 500 ohms max. T/C: 10,000 ohms max. Effect: 0.001 °C/ohm
Maximum Load:	$R_{max} = (V_{supply} - 10V) / 20 \text{ mA}$
Stability:	Zero drift: 0.02 °C/°C Span drift: 0.01 °C/°C
Ambient Temperature:	-40 to + 85 °C
Housing:	Epoxy-coated zinc alloy
Start-up Time:	20 seconds
Warm-up Time:	5 minutes
Open Circuit Detection:	Upscale standard

#### \*Available sensor ranges and limitations

Sensor Type	Min. Temp.	Max. Temp.	Min. Span
<b>J T/C</b>	-200°C	1200°C	50°C
<b>K T/C</b>	-270°C	1370°C	50°C
<b>E T/C</b>	-270°C	1000°C	50°C
<b>T T/C</b>	-270°C	400°C	50°C
<b>R or S T/C</b>	-60°C	1760°C	250°C
<b>B T/C</b>	0°C	1820°C	600°C
<b>Pt100, Pt250, Pt500 and Pt1000 RTD</b>	-200°C	850°C	25°C
<b>Ni100, Ni500 and Ni1000 RTD</b>	-60°C	250°C	25°C
<b>Cu10 and Cu100 RTD</b>	-200°C	250°C	25°C

**Note:** when used as an option in combination with a temperature sensor assembly, use option code **TR11** at end of assembly part #.

## 4-20 MA/HART® OUTPUT, ISOLATED

### How to build a part number:

To order an Applied Sensor Technologies transmitter, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

TRANSMITTER TYPE	INPUT	RANGE	UNITS OF MEASURE	OPTION

#### TRANSMITTER TYPE

**UNI5-H** – Isolated transmitter with single 4-20mA/HART® output for terminal head mounting

#### INPUT

**J** – J type thermocouple

**K** – K type thermocouple

**E** – E type thermocouple

**T** – T type thermocouple

**Pt100** – 100-ohm platinum RTD

**Pt250** – 250-ohm platinum RTD

**Pt500** – 500-ohm platinum RTD

**Pt1000** – 1000-ohm platinum RTD

**R** – R type thermocouple

**S** – S type thermocouple

**B** – B type thermocouple

**Ni100** – 100-ohm nickel RTD

**Ni500** – 500-ohm nickel RTD

**Ni1000** – 1000-ohm nickel RTD

**Cu10** – 10-ohm copper RTD

**Cu100** – 100-ohm copper RTD

**RANGE** (specify minimum and maximum values, e.g., 0-100)\*

# – **Minimum Range Value** (temperature value that equals 4 mA)

# – **Maximum Range Value** (temperature value that equals 20 mA)

#### UNITS OF MEASURE

Specify °F or °C

#### OPTION

**DS01** – Downscale open circuit protection

\*See chart below for available sensor ranges and minimum spans

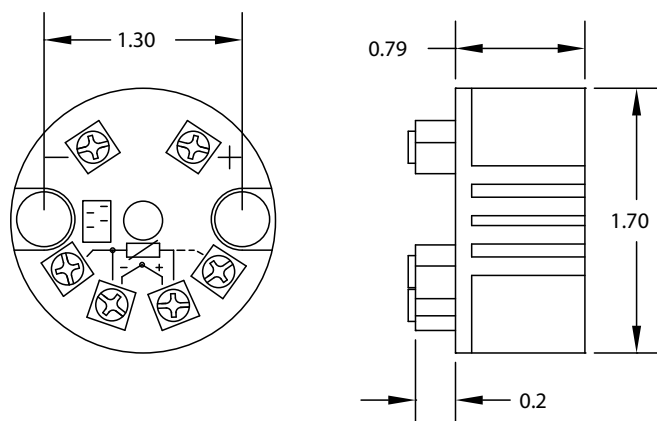
#### Specifications

Input:	Thermocouple or 3-wire/4-wire RTD
Isolation (I/O):	500 VDC
Supply Voltage:	10-40 VDC, polarity protected
Output:	4-20mA or 20-4 mA
Digital Output:	HART® protocol
Sensor Lead Resistance:	RTD: 500 ohms max. T/C: 10,000 ohms max.
Maximum Load:	$R_{max} = (V_{supply} - 10) / 20 \text{ mA}$
Stability:	0.005%/°C (zero & span drift)
Ambient Temperature:	-40 to + 85°C
Housing:	Epoxy-coated zinc alloy
Open Circuit Detection:	Upscale standard

#### \*Available sensor ranges and limitations

Sensor Type	Min. Temp.	Max. Temp.	Min. Span
<b>J T/C</b>	-200°C	1200°C	50°C
<b>K T/C</b>	-270°C	1370°C	50°C
<b>E T/C</b>	-270°C	1000°C	50°C
<b>T T/C</b>	-270°C	400°C	50°C
<b>R or S T/C</b>	-60°C	1760°C	250°C
<b>B T/C</b>	0°C	1820°C	600°C
<b>Pt100, Pt250, Pt500 and Pt1000 RTD</b>	-200°C	850°C	25°C
<b>Ni100, Ni500 and Ni1000 RTD</b>	-60°C	250°C	25°C
<b>Cu10 and Cu100 RTD</b>	-200°C	250°C	25°C

UNI5-H



**Note:** when used as an option in combination with a temperature sensor assembly, use option code **TR13** at end of assembly part #.

## 4-20 MA OUTPUT, NON-ISOLATED

### How to build a part number:

To order an Applied Sensor Technologies transmitter, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

TRANSMITTER TYPE	INPUT	RANGE	UNITS OF MEASURE

#### TRANSMITTER TYPE

**TC2** – Non-isolated transmitter with thermocouple input and single 4-20 mA output for terminal head mounting

**RTD2** – Non-isolated transmitter with RTD input and single 4-20 mA output for terminal head mounting

#### INPUT

**J** – J type thermocouple

**K** – K type thermocouple

**E** – E type thermocouple

**T** – T type thermocouple

**R** – R type thermocouple

**S** – S type thermocouple

**B** – B type thermocouple

**Pt100** – 100-ohm platinum RTD (RTD2 only)

**RANGE** (specify minimum and maximum values, e.g., 0-100)\*

# – **Minimum Range Value** (temperature value that equals 4 mA)

# – **Maximum Range Value** (temperature value that equals 20 mA)

#### UNITS OF MEASURE

Specify °F or °C

#### Specifications

Supply Voltage: 8-38 VDC, polarity protected

Maximum Load:  $R_{max} = (V_{supply} - 8V) / 20 \text{ mA}$

Stability (both zero and span drift): RTD: 0.03% of span/°C (100°C span)

T/C: 0.04% of span/°C (25 mV span)

Linearity: RTD: better than +/- 0.05% of span

T/C: better than +/- 0.03% of span

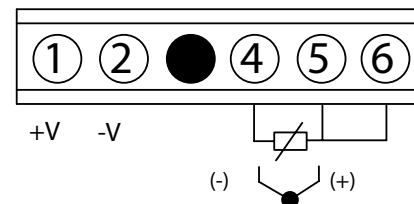
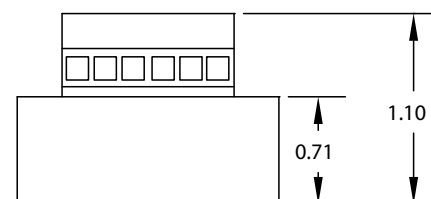
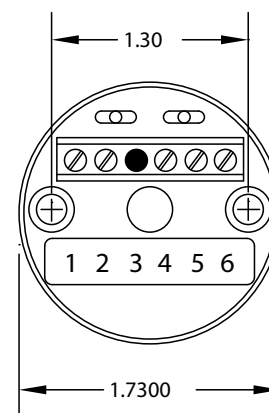
Ambient Temperature: -20 to + 70°C

Humidity: 0-95% RH, non-condensing

\*Input span: RTD: 20°C min., 500°C max.

T/C: 10 mV min.

#### RTD2 AND TC2



**Note:** when used as an option in combination with a temperature sensor assembly, use option code **TR12** at end of assembly part #.

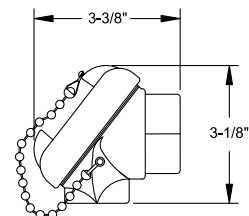


## **NEMA 4 & 4X REPLACEMENT HEADS AND TERMINAL BLOCKS**

### **CAST ALUMINUM – gasketed screw cover**

NEMA 4 with gasketed screw cover and stainless steel chain;  
4-post ceramic terminal block included. For epoxy-coated, NEMA  
4X, add suffix-E to part#. (e.g., PH01E)

Ordering Code	Process Conn.	Conduit Conn.
PH01	1/2"	1/2"
PH02	1/2"	3/4"
PH03	3/4"	3/4"

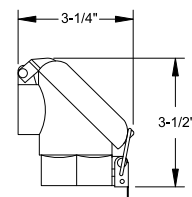


PH01 - PH06

### **CAST IRON – NEMA 4, gasketed screw cover**

NEMA 4 with gasketed screw cover and stainless steel chain;  
4-post ceramic terminal block included. For epoxy-coated, NEMA  
4X, add suffix-E to part #. (e.g., PH04E)

Ordering Code	Process Conn.	Conduit Conn.
PH04	1/2"	1/2"
PH05	1/2"	3/4"
PH06	3/4"	3/4"

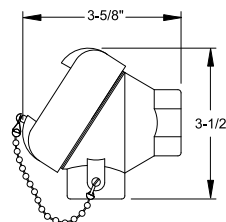


PH45

### **CAST ALUMINUM – flip-top cover**

NEMA 4 with flip-top cover and latching closure, 4-post ceramic  
terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH45	1/2"	3/4"



PH47

### **316 STAINLESS STEEL – NEMA 4X, gasketed screw cover**

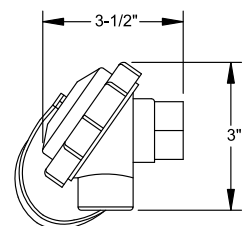
NEMA 4X with gasketed screw cover and stainless steel chain;  
4-post ceramic terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH47	1/2"	3/4"

### **BLACK POLYPROPYLENE – NEMA 4, gasketed screw cover**

NEMA 4 with gasketed screw cover, 4-post ceramic terminal block  
included.

Ordering Code	Process Conn.	Conduit Conn.
PH23	1/2"	3/4"

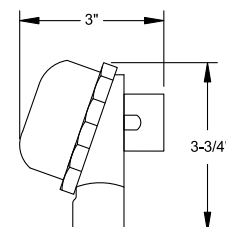


PH23 - PH24

### **WHITE POLYPROPYLENE – NEMA 4, gasketed screw cover**

NEMA 4 with gasketed screw cover and stainless steel chain;  
4-post ceramic terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH24	1/2"	3/4"



PH26

### **NYLON – NEMA 4, gasketed screw cover**

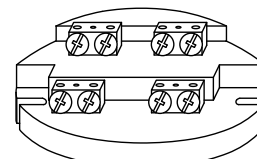
Gasketed screw cover, 4-post ceramic terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH26	1/2"	1/2"

### **CERAMIC TERMINAL BLOCK REPLACEMENTS**

For NEMA 4 heads, brass terminals

Ordering Code	No. of Terminals	Max. Wire Size
PH39	2	8 AWG.
PH40	3	8 AWG.
PH41	4	8 AWG.
PH42	6	14 AWG.



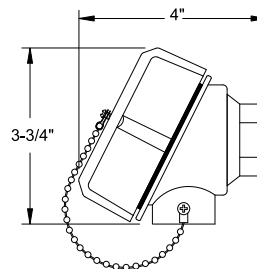
PH41

## EXPLOSION-PROOF REPLACEMENT HEADS AND TERMINAL BLOCKS

### CAST ALUMINUM – FM/CSA approved

FM/CSA approved for Class I, Div. 1, Groups B, C, D; Class II, Groups E, F, G; gasketed screw cover and stainless steel chain; 6-post ceramic terminal block included. For epoxy-coated, add suffix-E to part #. (e.g., PH50E)

Ordering Code	Process Conn.	Conduit Conn.
PH50	1/2"	1/2"
PH51	1/2"	3/4"
PH52	3/4"	3/4"

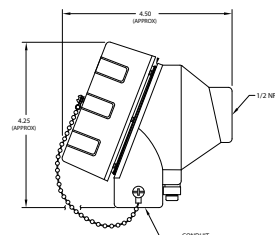


PH50-52

### CAST ALUMINUM – ATEX approved

ATEX approved for EEx d IIC, gasketed screw cover and stainless steel chain; 3-post ceramic terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH53	1/2"	3/4"

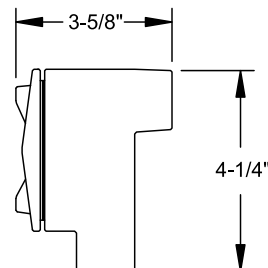


PH53

### CAST ALUMINUM – UL/CSA approved

UL/CSA approved for Class I, Div. 1, Groups C, D; Class II, Groups E, F, G; screw cover; 4-post plastic terminal strip included. For epoxy-coated, add suffix-E to part #. (e.g., PH17E)

Ordering Code	Process Conn.	Conduit Conn.
PH17	1/2"	1/2"
PH18	1/2"	3/4"
PH19	3/4"	3/4"

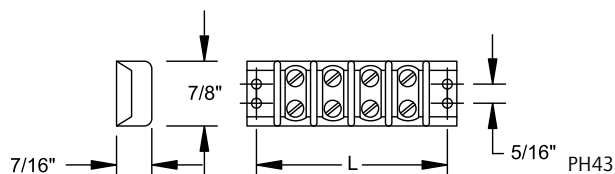


PH17-19

### PLASTIC TERMINAL STRIP REPLACEMENTS

For explosion-proof heads (PH17-PH22), brass terminals

Ordering Code	No. of Terminals	Length of Strip
PH43-4	4	2.16"
PH43-6	6	2.91"

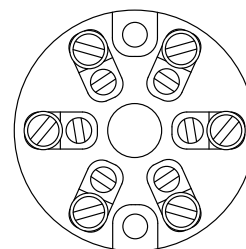


PH43

### CERAMIC TERMINAL BLOCK REPLACEMENTS

For explosion-proof heads (PH50-PH52), brass terminals

Ordering Code	No. of Terminals	Max. Wire Size
PH48	3	8 AWG.
PH49	6	14 AWG.



PH49

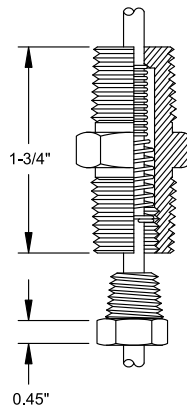


## PARTS TO CONNECT TO WIRING OR THE PROCESS

COMPRESSION FITTINGS			
For 1/8" diameter sheath			
Part Number	NPT	Body/Nut	Ferrule
<b>PF38</b>	1/8"	304 stst	304 stst
<b>PF39</b>	1/8"	304 stst	Teflon®
<b>PF40</b>	1/4"	304 stst	304 stst
<b>PF41</b>	1/4"	304 stst	Teflon®
For 3/16" diameter sheath			
<b>PF52</b>	1/8"	304 stst	304 stst
<b>PF53</b>	1/8"	304 stst	Teflon®
<b>PF54</b>	1/8"	Brass	Brass
<b>PF55</b>	1/4"	304 stst	304 stst
<b>PF56</b>	1/4"	304 stst	Teflon®
<b>PF59</b>	1/2"	304 stst	304 stst
<b>PF60</b>	1/2"	304 stst	Teflon®
For 1/4" diameter sheath			
<b>PF63</b>	1/8"	304 stst	304 stst
<b>PF65</b>	1/4"	304 stst	304 stst
<b>PF66</b>	1/4"	304 stst	Teflon®
<b>PF67</b>	1/4"	Teflon®	Teflon®
<b>PF68</b>	1/4"	Brass	Brass
<b>PF73</b>	1/2"	304 stst	304 stst
<b>PF74</b>	1/2"	304 stst	Teflon®
<b>PF75</b>	1/2"	Brass	Brass



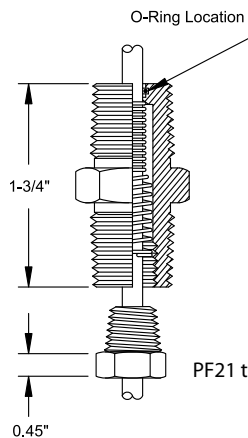
PF38 to PF75



PF13 to PF18

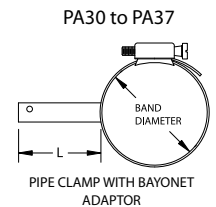
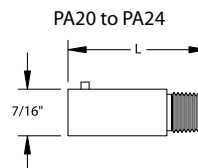
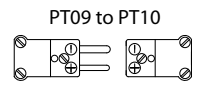
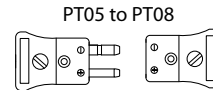
SPRING-LOADED FITTINGS			
Standard, Non-sealed			
Part Number	Process Conn.	Conduit Conn.	Sensor Diameter
<b>PF13</b>	1/2" NPT	1/2" NPT	3/16"
<b>PF14</b>	1/2" NPT	1/2" NPT	1/4"
<b>PF17</b>	3/4" NPT	3/4" NPT	3/16"
<b>PF18</b>	3/4" NPT	3/4" NPT	1/4"
O-Ring Sealed*			
<b>PF21</b>	1/2" NPT	1/2" NPT	3/16"
<b>PF22</b>	1/2" NPT	1/2" NPT	1/4"
<b>PF25</b>	3/4" NPT	3/4" NPT	3/16"
<b>PF26</b>	3/4" NPT	3/4" NPT	1/4"

Notes:  
1. Maximum pressure rating 15 psi  
2. Buna N O-ring rated for -23 to 93°C (-10 to 200°F)



PF21 to PF26

PLUGS AND JACKS	
(Note: specify J, K, E or T calibration. e.g., PT05-J)	
<b>PT05</b>	Standard plug, rated to 177°C (350°F)
<b>PT06</b>	Standard jack, rated to 177°C (350°F)
<b>PT07</b>	High Temp. plug, rated to 260° (500°F)
<b>PT08</b>	High Temp. jack, rated to 260° (500°F)
<b>PT09</b>	Miniature plug, rated to 177°C (350°F)
<b>PT10</b>	Miniature jack, rated to 177°C (350°F)
<b>PA9</b>	Rubber boot for use with PT05/PT06
<b>PA10</b>	Cable clamp for PT05 to PT08
<b>PA11</b>	Neoprene bushing for use with PA10 to prevent wire abrasion



PIPE CLAMP WITH BAYONET ADAPTOR

BAYONET ADAPTERS (PLATED STEEL)		
Part Number	Thread Size	Length (L)
<b>PA20</b>	1/8" - 27 NPT	7/8"
<b>PA21</b>	1/8" - 27 NPT	1"
<b>PA22</b>	1/8" - 27 NPT	1-1/2"
<b>PA23</b>	1/8" - 27 NPT	2"
<b>PA24</b>	1/8" - 27 NPT	2-1/2"
PIPE CLAMP AND BAYONET ADAPTERS		
Part Number	Band Diameter	Adapter Length (L)
<b>PA30</b>	1-1/4" to 2-1/4"	1"
<b>PA31</b>	1-1/4" to 2-1/4"	2"
<b>PA32</b>	2-1/4" to 3-1/4"	1"
<b>PA33</b>	2-1/4" to 3-1/4"	2"
<b>PA34</b>	3-1/4" to 4-1/4"	1"
<b>PA35</b>	3-1/4" to 4-1/4"	2"
<b>PA36</b>	4-1/4" to 5"	1"
<b>PA37</b>	4-1/4" to 5"	2"

## THERMOCOUPLE AND EXTENSION-GRADE WIRE

### THERMOCOUPLE GRADE WIRE

Used to either fabricate thermocouples by creating a junction in one end of the wire pair, or as extension wire between the thermocouple and the measuring device. The conditions of measurement determine the type of thermocouple wire and insulation that should be used. Temperature range, wire gauge, environment, protection, insulation requirements, response and service life should all be considered.

### THERMOCOUPLE EXTENSION WIRE

Has approximately the same thermoelectric characteristics as thermocouple grade wire, but its purpose is only to carry the signal, not to measure temperature. Thermocouple extension wire is usually lower in cost.

Insulation Characteristics			
Description (individual conductors/overall)	Temperature Limits	Moisture Resistance	Abrasion Resistance
Teflon®/Teflon® FEP	204°C (400°F)	Excellent	Excellent
Teflon®/ Teflon® TFE or PFA Tape	260°C (500°F)	Excellent	Excellent
Fiberglass/Fiberglass	482°C (900°F)	Fair	Fair
Fiberglass (Filaflex®)/Fiberglass (Filaflex®) High Temp	760°C (1400°F)	Fair	Fair

Calibration	Part Number		
	TC Grade, Stranded Wire	TC Grade, Solid Wire	Extension Grade, Stranded
<b>Teflon®/ Teflon® FEP insulated, 20 Gauge</b>			
Type J	20JST58	20JS58	20JXST58
Type K	20KST58	20KS58	20KXST58
Type T	20TST58	20TS58	20TXST58
Type E	20EST58	20ES58	20EXST58
<b>Teflon®/ Teflon® TFE Tape insulated, 20 Gauge</b>			
Type J	20JST60	20JS60	20JXST60
Type K	20KST60	20KS60	20KXST60
Type T	20TST60	20TS60	20TXST60
Type E	20EST60	20ES60	20EXST60
<b>Fiberglass/Fiberglass insulated, 20 Gauge</b>			
Type J	20JST57	20JS57	20JXST57
Type K	20KST57	20KS57	20KXST57
Type T	20TST57	20TS57	20TXST57
Type E	20EST57	20ES57	20EXST57
<b>Fiberglass (Filaflex®)/Fiberglass (Filaflex®) insulated, 20 Gauge</b>			
Type J	20JST70	20JS70	20JXST70
Type K	20KST70	20KS70	20KXST70
Type T	20TST70	20TS70	20TXST70
Type E	20EST70	20ES70	20EXST70
<b>Fiberglass (Filaflex®)/ Fiberglass (Filaflex®) insulated, stainless steel overbraid, 20 Gauge</b>			
Type J	20JST71	20JS71	20JXST71
Type K	20KST71	20KS71	20KXST71
Type T	20TST71	20TS71	20TXST71
Type E	20EST71	20ES71	20EXST71

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**Filaflex®** is a registered trademark of PMC Corporation