



INDUSTRIAL TEMPERATURE SENSORS





Temperature Sensors

Temperature Sensors

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OVERVIEW

Applied Sensor Technologies, a Division of United Electric Controls, designs and manufactures temperature sensor assemblies for a wide variety of applications in a diverse set of markets:

- End-user: Including process, utility and discrete manufacturing
- OEM: From medical and lab, to food equipment, to chillers and HVAC
- Defense-related: Sensors for gas turbine inlet and exhaust temperature, and auxiliary equipment

Our sensing technologies include thermocouples, RTDs, thermistors and integrated circuit temperature sensors.

Our ISO9001 certification and Lean Manufacturing expertise differentiate us from many of our competitors, bringing consistent and efficient speed to our manufacturing processes.

This bulletin will give you an excellent overview of our standard line of industrial temperature sensors. Many of our products, however, have been specifically designed for individual customers, looking to fulfill a particular application. If you do not find exactly what you need, please contact us – we'd be happy to work with you.

APPLICATIONS

Applied Sensor Technologies Temperature Sensor Customers

At Applied Sensor Technologies we manufacture all types of Temperature Sensors and have customers purchasing both custom designed and standard catalog products.

OEM Sensor Capabilities



Applied Sensor Technologies excels in supplying today's exacting manufacturers with temperature sensors that meet their specific needs. We can help you develop, and then manufacture the sensor that works with your product. We bring many strengths to the OEM customer, including:

- Sales personnel located around the world so they can be available to serve customers whenever and wherever they need assistance.
- Engineering expertise to work with your engineers to develop the right design.
- Highly efficient manufacturing processes designed to build your sensor economically and reliably.
- Quick Response - we'll deliver your parts when *you* need them.

Our sensors are included in many scientific instruments; used to make certain that the food you

What can you expect from us? • Excellent service • Competitive pricing • Innovative solutions

eat is properly cooked or stored; used in medical equipment where reliability is the primary concern; used in aerospace to make certain that engines are operating at peak efficiency.

Standard Catalog Products

This catalog covers a broad selection of Standard Catalog Temperature Sensors designed for general industrial use, including General Purpose and Mineral Insulated thermocouples, wire-wound and thin film RTDs and thermistors for all standard applications.

In addition, we offer a wide selection of accessories like thermowells, transmitters and extension wire.



These assemblies are used in a wide variety of industrial applications, from turbines in electric power plants, to compressors, control systems, HVAC systems and many other places in industry.

These standard products are available from our worldwide network of distributors or directly from our factory in Watertown, MA.

TECHNOLOGY

Thermocouples

A thermocouple is two wires of different metals, joined at one end. Changes in the temperature at the juncture induce a change in electromotive force (EMF) at the opposite end.

Thermocouple Types

There are many different types of thermocouples, made of different types of wire. They have very different properties, making one type better for a specific application than another.

Type J – the most widely used thermocouple; it is versatile and has a relatively low cost. The operating range for this alloy combination is from 0° to 750°C (32° to 1380°F) for the largest wire sizes.

Type T – recommended for use in mildly oxidizing and reducing atmospheres at temperatures from 0° to 350°C (32 to 660°F). They are suitable for applications where moisture is present. This alloy is recommended for low temperature measurement.

Type K – often used at high temperatures, it is recommended for use in clean oxidizing atmospheres. The operating range for this alloy is from 0° to 1250°C (32° to 2280°F) for the largest wire sizes.

Type E – has the highest EMF of all standard thermocouples. It is recommended for use in oxidizing, inert or dry reducing atmospheres, or for short periods of time in a vacuum. These elements must be protected from sulfurous and marginally oxidizing atmospheres. Type E thermocouples can be used for temperatures from 0° to 900°C (32° to 1650°F).



Temperature Sensors

Temperature Sensors

TECHNOLOGY

Thermocouple Insulation Types

Thermocouples are available in three basic constructions:

GP – The lowest-cost construction, general-purpose thermocouples are comprised of a pair of thermocouple wires inside a tube. These are used to measure temperatures of 260°C (500°F) or less.

MI – For higher temperature applications, or where ruggedness is more important, mineral-insulated construction is preferred. Consisting of compacted magnesium oxide powder around the conductors, these are typically used to measure temperatures of 260°C (500°F) or higher.

BTC – Beaded thermocouples, bare wire strung on ceramic insulators, are mainly used in high temperature applications, such as furnaces.

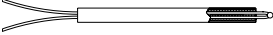
There are three common configurations for the junction of a thermocouple: exposed, grounded, and ungrounded.

U=Ungrounded 

U = Ungrounded junction is electrically isolated from the sheath material by magnesium oxide insulation. This slows the response time, but electrically isolates the junction.

G=Grounded 

G = Grounded junction forms an integral part of the thermocouple sheath tip. It protects wires from environmental chemicals or corrosives while it prolongs the life of the sensor. Recommended for high pressure applications.

E=Exposed 

E = Exposed junction (half-shielded tip) extends beyond the protective metallic sheath. Recommended for measurement of non-corrosive gas or air. Very fast response time.

RTD

A RTD capitalizes on the fact that the electrical resistance of a metal changes as its temperature changes, with the resistance rising more or less linearly with temperature. RTD's either use a length of conductor (platinum, nickel iron or copper) wound around an insulator, or use a thin film of the conductor deposited on a ceramic substrate.

RTD's are stable and have a fairly wide temperature range, but are slower to respond than thermocouples. Since they require the use of electric current to make measurements, RTD's can be subject to small inaccuracies from self-heating. RTD's are used to measure temperatures from -196° to 788°C (-320° to 1450°F).

Thermistors

Thermistors rely on the resistance change in a ceramic semiconductor, with the resistance dropping non-linearly as the temperature rises.



Thermistors are a low-cost solution to temperature measurement. They tend to have large signal outputs and their small size permits fast response to temperature changes from -45° to 260°C (-50° to 500°F).

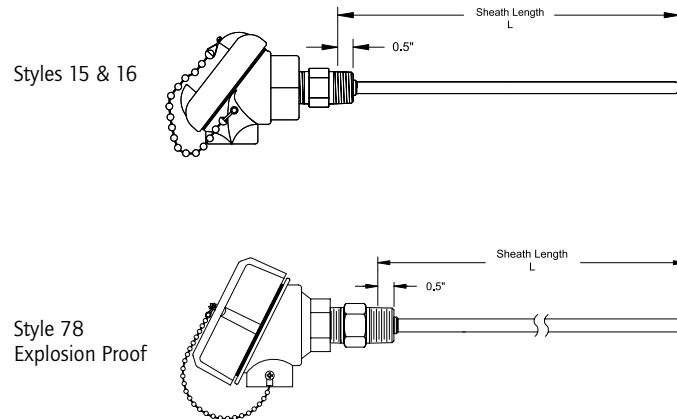
IC Sensor

The integrated circuit (IC) temperature transducer can be designed to give either voltage or current output and is extremely linear. IC sensors are a very effective way to produce an analog voltage proportional to temperature. They have a limited temperature range and are used to measure temperatures from -45° to 150°C (-50° to 300°F).



THERMOCOUPLE CONNECTION HEAD WITH HEX FITTING

Styles 15, 16, and 78



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Options

SENSOR TYPE

GP – General Purpose Thermocouple
MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

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

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

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

SHEATH DIAMETER (in inches)

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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction

SHEATH LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

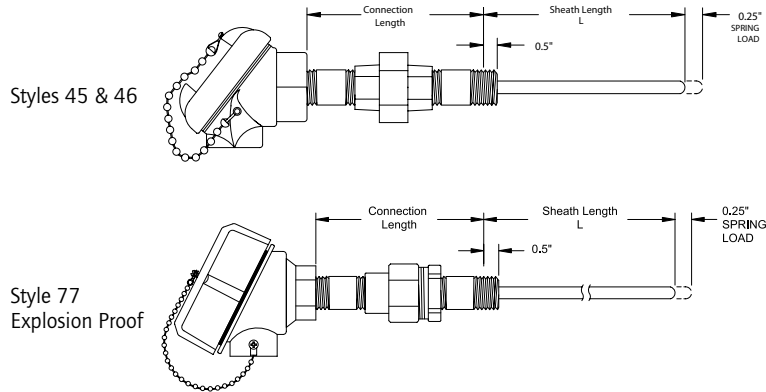


Thermocouples

Thermocouples

THERMOCOUPLE CONNECTION HEAD, SPRING LOAD ASSEMBLY WITH MOUNTING HARDWARE

Styles 45, 46 and 77



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	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; 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

46 – Sheath with cast iron head; spring loaded; head approved 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT carbon steel process connection; gasketed screw cover with stainless steel chain

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

See Styles 37 and 79X for replacement probes.

CONNECTION

H – Head Only, no 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" after Connection for 304 St/St fittings)

CONNECTION LENGTH

(e. g., 006 = 6 inch) –

(3" minimum length, 6" standard length for NUN connection)

SHEATH DIAMETER (in inches)

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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction

U – Ungrounded Junction

SHEATH LENGTH

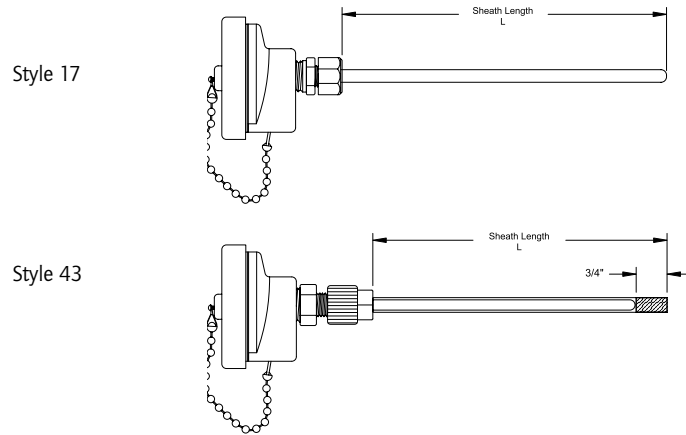
L# - (e. g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

THERMOCOUPLE MINIATURE WEATHERPROOF HEAD

Styles 17 and 43 (Teflon® Sleeve Optional)



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Options

SENSOR TYPE

GP – General Purpose Thermocouple
MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

17 – Sheath with miniature weatherproof plastic head; conforms to NEMA 4X requirements; 1/4" NPT conduit connection; molded in terminals; stainless steel compression fitting; gasketed screw cover with stainless steel chain; maximum termination temperature 177°C (350°F)

43 – Sheath with protective Teflon® sleeve; miniature weatherproof plastic head; conforms to NEMA 4X requirements; 1/4" NPT conduit connection; molded in terminals; Teflon® compression fitting; gasketed screw cover with stainless steel chain; maximum termination temperature 177°C (350°F); Maximum tip temperature 260°C (500°F)

SHEATH DIAMETER (in inches)

6 – 3/16 (0.188). Finished O.D.=0.240 (style 43 only)
7 – 1/4 (0.250). Finished O.D.= 0.300 (style 43 only)

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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction

SHEATH LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

Teflon® is a registered trademark of E.I. DuPont.

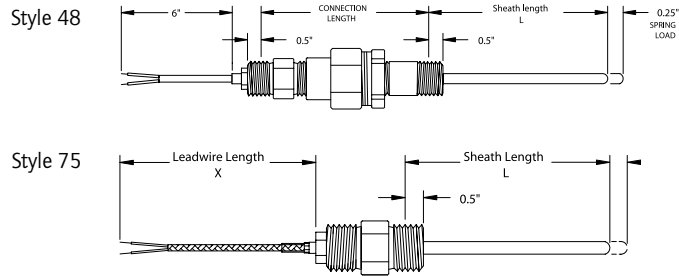


Thermocouples

Thermocouples

THERMOCOUPLE SHEATH WITH HEX CONNECTION; SPRING LOADED

Styles 48 and 75



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	Connection Length	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Leadwire Length	Options

SENSOR TYPE

MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

48 – Sheath with connection hardware; spring loaded hex connector; no head; explosion proof union

75 – Sheath with double sided mounting; fiberglass insulated conductors; fiberglass jacket; 1/2" NPT stainless steel connection; spring loaded

CONNECTION (Style 48 only)

N – 1/2" NPT stainless steel hex fitting, (3/4" length below hex)

NU – 1/2" NPT stainless steel hex fitting with electro plate union, (2.5" length only)

NUN – 1/2" NPT stainless steel hex fitting with electro plate union and carbon steel nipple
(Add suffix "1S" after Connection for 304 St/St nipple)

CONNECTION LENGTH (Style 48 only)

(e. g., 006 = 6 inch)

(3" minimum length, 6" standard length for NUN connection)

SHEATH DIAMETER (in inches)

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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction

U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

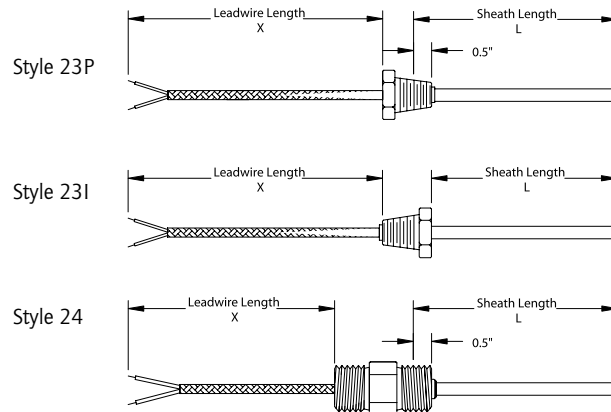
X# - (e. g., X72 = 72 inch length)

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

THERMOCOUPLE SINGLE SIDE HEX MOUNTING AND DOUBLE SIDED PROCESS MOUNTING

Styles 23P, 23I and 24



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Leadwire Length	Options

SENSOR TYPE

GP – General Purpose Thermocouple
 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 mounting; fiberglass insulated conductors; fiberglass jacket; 1/2" NPT stainless steel connection

Style 24 can also be used as a replacement element for Styles 15, 16 and 78

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)
 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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
 U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.



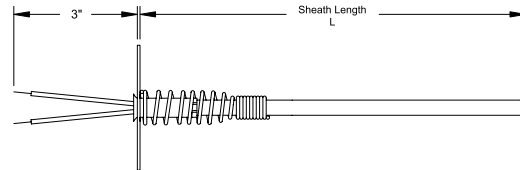
Thermocouples

Thermocouples

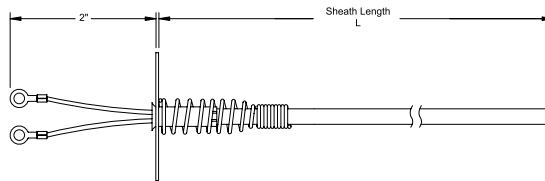
THERMOCOUPLE SPRING LOADED REPLACEMENT ASSEMBLY

Styles 37 & 79X - Replacement Elements

Style 37



Style 79X



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Options

SENSOR TYPE

MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

37 – Sheath with spring loaded assembly; Teflon® insulated conductors; replacement element for use with styles 45 and 46 – Specify specifications of original probe when ordering this replacement style

79X – Sheath with spring loaded assembly; Teflon® insulated conductors; replacement element for use with style 77 Specify specifications of original probe when ordering this replacement style

SHEATH DIAMETER (in inches)

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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction

U – Ungrounded Junction

SHEATH LENGTH

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

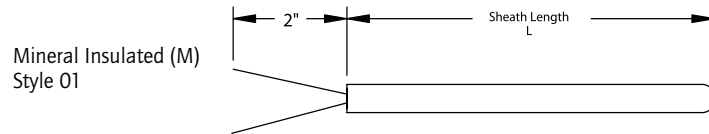
*Sheath length comprises installation length and connection length

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

THERMOCOUPLE MINERAL INSULATED CABLE

Style 01



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Options

SENSOR TYPE

MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

01 – Mineral Insulated cable; 2" uninsulated solid conductors, ceramic seal

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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction
E – Exposed Junction

SHEATH LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

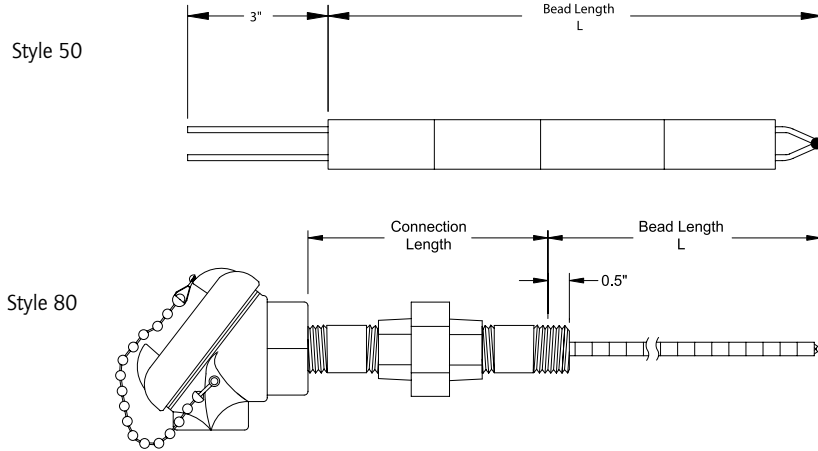


Thermocouples

Thermocouples

BEADED THERMOCOUPLE

Styles 50 and 80



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	Wire Gauge	Calibration	Hot Junction	Bead Length	Insulators	Options

SENSOR TYPE

BTC – Beaded Thermocouple

ASSEMBLY STYLE

50 – Beaded thermocouple only; or replacement element
 80 – Beaded thermocouple with cast aluminum head; head conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT carbon steel process connection

CONNECTION (Style 80 only)

H – Head only - no 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 "IS" after connection for 304 SST)

CONNECTION LENGTH (Style 80 only)

(e.g., 006 = 6 inch) –
 (3" minimum length, 6" standard length for NUN connection)

WIRE GAUGE

08C – 8 AWG gauge oval ceramic bead; bead diameter dimensions: 0.5" x 0.28"
 08R – 8 AWG gauge round ceramic bead; bead diameter dimensions: 0.5" single; 0.5" dual
 14R – 14 AWG gauge round ceramic bead; bead diameter dimensions: 0.25" single; 0.315" dual

CALIBRATION – Standard Limits– Dual calibration available in round configuration only

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 available as an option by adding "P" after Calibration

HOT JUNCTION

E – Exposed Junction
 TE – Twisted Exposed Junction
 U – Ungrounded

BEAD LENGTH

L# - (e. g., L6 = 6 inch bead length)

INSULATORS

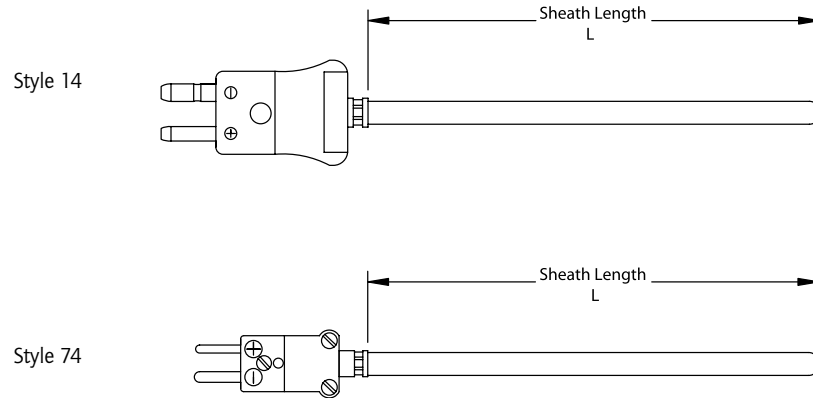
M - Mullite
 A - Alumina

OPTIONS AND ACCESSORIES

See pages 42 through 65 for accessories and protection tubes

THERMOCOUPLE SHEATH WITH MALE PLUG

Styles 14 and 74



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	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 74 only
4 – 1/8 (0.125)
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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction

SHEATH LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.



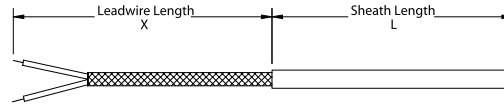
Thermocouples

Thermocouples

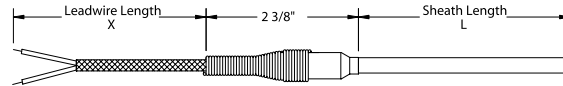
THERMOCOUPLE SHEATH WITH LEADWIRE

Styles 02, 04, 05, 07, 28 and 69

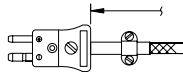
General Purpose (GP)
Styles 02, 04 & 28



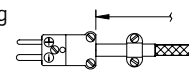
Mineral Insulated (MI)
Styles 02, 04 & 28



Standard Plug
Styles 05 & 07



Miniature Plug
Style 69



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	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
- 05** – Sheath with leadwire; fiberglass insulated conductors; fiberglass jacket; **standard male plug**
- 07** – Sheath with leadwire; fiberglass insulated conductors; fiberglass jacket; **stainless steel overbraid; standard male plug**
- 28** – Sheath with Teflon® insulated conductors; Teflon® jacketed cable
- 69** – Sheath with leadwire; fiberglass insulated conductors; fiberglass jacket; **miniature plug**

SHEATH DIAMETER (in inches)

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

Dual Junctions not available with GP Thermocouples in sheath diameter 4

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 available as an option by adding "P" after Calibration

HOT JUNCTION

- G – Grounded Junction
- U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

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

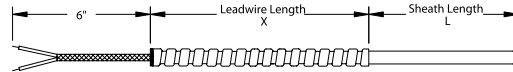
OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

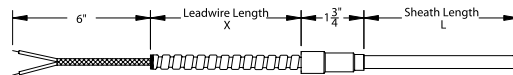
THERMOCOUPLE SHEATH WITH LEADWIRE AND ARMOR

Styles 03 and 25

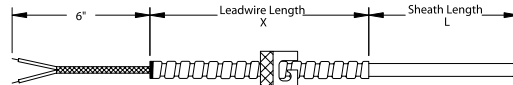
General Purpose (GP)
Style 03



Mineral insulated (MI)
Style 03



Adjustable Bayonet Cap
Style 25



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Leadwire Length	Options

SENSOR TYPE

GP – General Purpose Thermocouple
MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

03 – **Sheath with leadwire**; fiberglass insulated conductors; fiberglass jacket; flexible stainless steel armor cable
25 – **Sheath with leadwire**; adjustable bayonet cap; fiberglass insulated conductors; fiberglass jacket; flexible stainless steel armor cable; GP Sensor type only

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)
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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

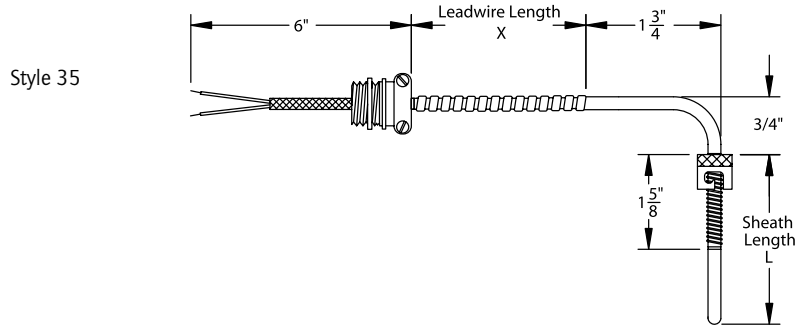


Thermocouples

Thermocouples

THERMOCOUPLE SPRING LOADED BAYONET FITTING WITH ARMOR

Styles 35, 70 and 71



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Leadwire Length	Options

SENSOR TYPE

- GP – General Purpose Thermocouple
- MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

- 35 – Sheath with St/St armor;** fiberglass insulated conductors; fiberglass jacket; spring loaded bayonet cap; 90 degree bend; 1/2" BX connector (use with Bayonet Adapter- see options)
- 70 – Sheath with St/St armor;** fiberglass insulated conductors; fiberglass jacket; spring loaded bayonet cap; 45 degree bend; 1/2" BX connector (use with Bayonet Adapter- see options)
- 71 – Sheath with St/St armor;** fiberglass insulated conductors; fiberglass jacket; spring loaded bayonet cap; no bend; 1/2" BX connector (use with Bayonet Adapter- see options)

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

Special Limits available as an option by adding "P" after Calibration

HOT JUNCTION

- G – Grounded Junction
- U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

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

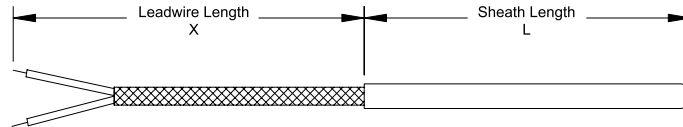
OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

THERMOCOUPLE CUTABLE SHEATH WITH LEADWIRE

Style 38

General Purpose (GP)
Style 38



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	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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction

U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.



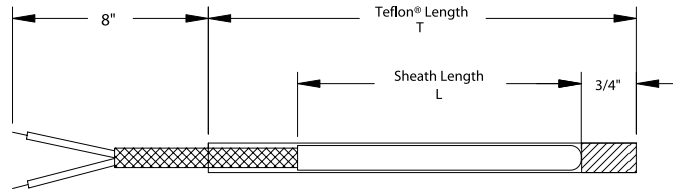
Thermocouples

Thermocouples

THERMOCOUPLE SHEATH WITH PROTECTIVE TEFLON® SLEEVE

Style 42

Style 42



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Teflon Sleeve	Leadwire Length	Options

SENSOR TYPE

GP – General Purpose Thermocouple
MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

42 – Sheath with protective Teflon® sleeve, Teflon® insulated conductors; Teflon® jacket; 8" extension beyond Teflon® sleeve; Maximum temperature 260°C (500°F)

SHEATH DIAMETER (in inches)

6 – 3/16 (0.188). Finished O.D.=0.240
7 – 1/4 (0.250). Finished O.D.=0.300

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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction

SHEATH LENGTH

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

TEFLON® SLEEVE

T# - (e. g., T6 = 6" of Teflon®, T12.5 = 12.5" of Teflon®)

LEADWIRE LENGTH

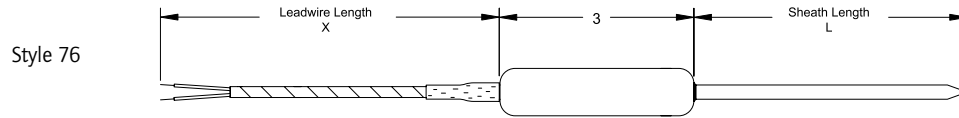
X# - (e. g., X12.5 = 12.5 inch length)
(Only complete for length longer than standard 8")

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

THERMOCOUPLE PENETRATION PROBE WITH TEFLON® JACKET LEADWIRE

Style 76



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Leadwire Length	Options

SENSOR TYPE

GP – General Purpose Thermocouple

ASSEMBLY STYLE

76 – Straight handle penetration probe with Teflon® jacket leadwire; nylon handle (NSF approved); maximum termination temperature 100°C (212°F)

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

Special Limits available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction

U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

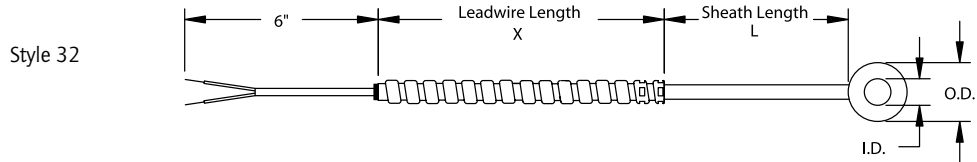


Thermocouples

Thermocouples

THERMOCOUPLE WASHER WITH LEADWIRE

Styles 32 and 73



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	Washer Size	Washer Material	Calibration	Hot Junction	Sheath Length	Leadwire 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; St/St washer thickness 3/16" (0.188"); Sheath diameter 0.188" only

73 – Washer with leadwire; fiberglass insulated conductors; fiberglass jacket; stainless steel overbraid; washer thickness 3/16" (0.188"); Sheath diameter 0.188" only

WASHER SIZE (in inches)

Actual Washer	ID	OD
6 – 3/16 (0.188)	0.193	0.375
7 – 1/4 (0.250)	0.255	0.500
9 – 3/8 (0.275)	0.380	0.750
10 – 1/2 (0.500)	0.510	1.000

WASHER 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 available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

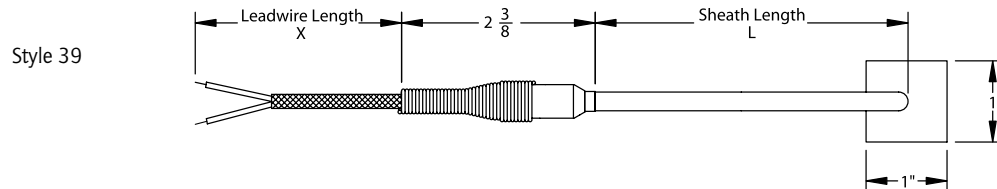
X# - (e. g., X72 = 72 inch length)

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

THERMOCOUPLE PAD WITH LEADWIRE

Style 39



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	Sheath Diameter	Sheath Material	Calibration	Hot Junction	Sheath Length	Leadwire Length	Options

SENSOR TYPE

MI – Mineral Insulated Thermocouple

ASSEMBLY STYLE

39 – Sheath with flat weld pad and leadwire; fiberglass insulated conductors; fiberglass jacket; pad same material as sheath, 1" X 1" pad size; 1/8" pad thickness; radiused pad available as an option (See page 43)

SHEATH DIAMETER (in inches)

- 4 – 1/8 (0.125)
- 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 available as an option by adding "P" after Calibration

HOT JUNCTION

- G – Grounded Junction
- U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

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

OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

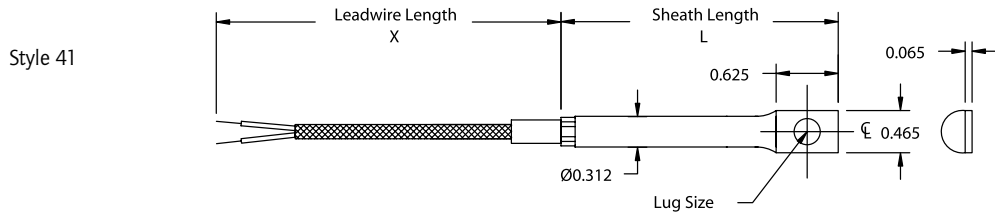


Thermocouples

Thermocouples

THERMOCOUPLE MOUNTING LUG WITH LEADWIRE

Style 41



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	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

41T – Stainless Steel mounting lug with Teflon® leadwire; diameter 0.312" only

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

Special Limits available as an option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction

U – Ungrounded Junction

SHEATH LENGTH

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

LEADWIRE LENGTH

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

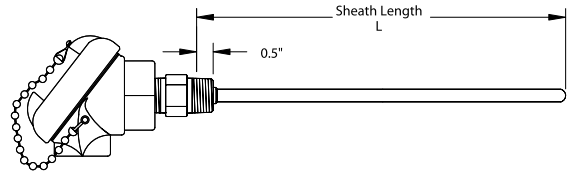
OPTIONS

See pages 42 through 65 for additional materials, terminations, fittings, etc.

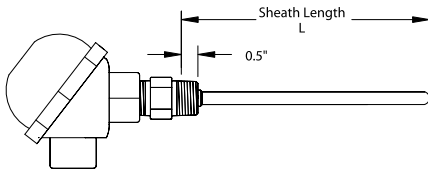
RTD CONNECTION HEAD WITH HARDWARE

Styles 15, 16, 78 and 29

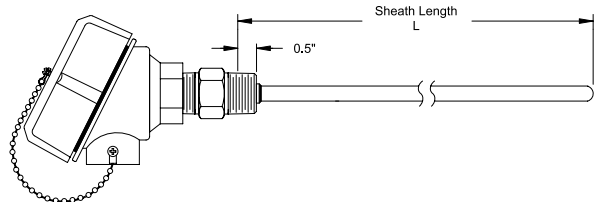
Styles 15 & 16



Style 29



Style 78
Explosion Proof



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Options

SENSOR TYPE (Prefix "D" for Dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP5 – Platinum; AM 0.00392; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction

ASSEMBLY STYLE

- 15 – Sheath with cast aluminum head;** conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT stainless steel process connection; gasketed screw cover with stainless steel chain
- 16 – Sheath with cast iron head;** conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT stainless steel process connection; gasketed screw cover with stainless steel chain
- 78 – Sheath with cast aluminum head;** head approved for Class I, Division 1, Groups B, C, D; Class II, Groups E, F, G; screw cover with chain and gasketed o-ring. CSA/FM approved; ceramic terminal block; 1/2" NPT conduit connection; 1/2" NPT stainless steel process connection.

- 29 – Sheath with nylon screw cover head;** conforms to NEMA 4X requirements; 1/2" NPT conduit connection; ceramic terminal block; 1/2" NPT stainless steel process connection; Maximum termination temperature 121°C (250°F)

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

TEMPERATURE RANGE – Maximum Range

- 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)
- Range 3 available only with RTP1 & RTP6 with Sheath Diameter #7 single element

SHEATH LENGTH

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

OPTIONS

See accessories, pages 42 through 65

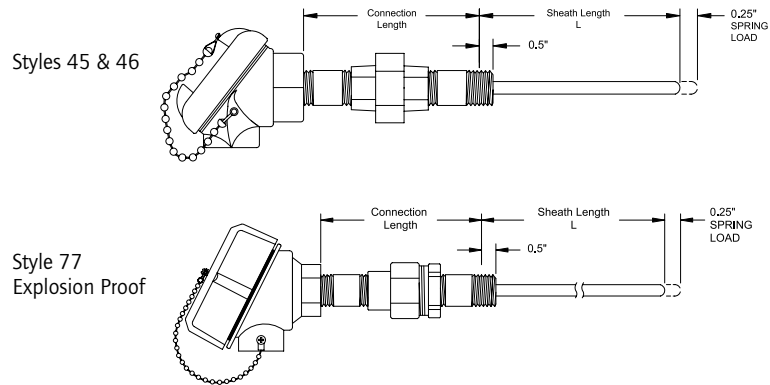


RTDs

RTDs

RTD CONNECTION HEAD WITH HARDWARE, SPRING LOADED

Styles 45, 46 and 77



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Connection	Connection Length	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Options

SENSOR TYPE (Prefix "D" for Dual element)

- RTP1** – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A** – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA** – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP5** – Platinum; AM 0.00392; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP6** – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7** – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction

ASSEMBLY STYLE

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

See styles 37 and 79X for replacement probes.

CONNECTION

- H** – Head Only; 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" after Connection for 304 St/St fittings)

CONNECTION LENGTH

- ### - (e.g., 006=6 inch)
- (3" minimum length, 6" standard length for NUN connection)

SHEATH DIAMETER (in inches)

- 6 – 3/16 (0.188)
- 7 – 1/4 (0.250)

SHEATH MATERIAL

- 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

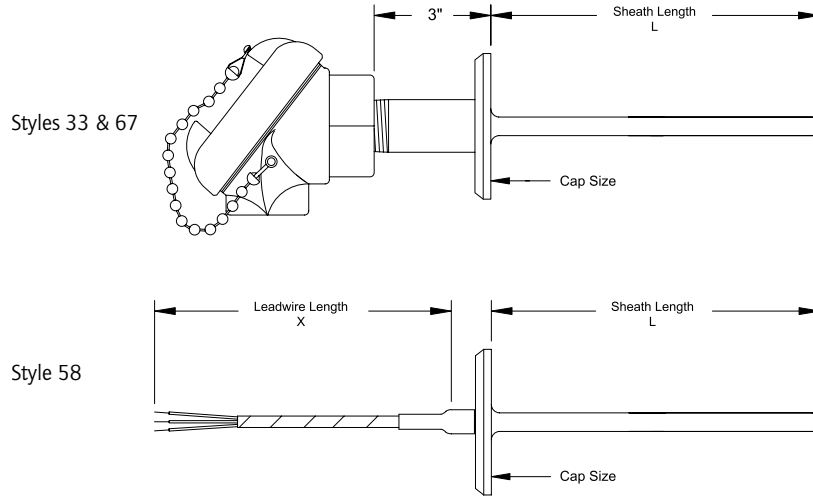
- 1 – 45 to 260°C (-50 to 500°F)
- 2 – 45 to 482°C (-50 to 900°F)
- 3 – 45 to 788°C (-50 to 1450°F)
- 4 – -200 to 260°C (-328 to 500°F)
- Range 3 available only with RTP1 and RTP6 with Sheath Diameter #7 single element

SHEATH LENGTH

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

RTD SANITARY CONNECTION WITH HEAD OR LEADWIRE

Styles 33, 58 and 67



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Cap Size	Cap Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction

ASSEMBLY STYLE

- 33 – Sheath with white polypropylene head; 3/4" NPT conduit connection; ceramic terminal block; sanitary process connection; stainless steel sheath; maximum termination temperature 104°C (220°F)
- 58 – Sheath with leadwire; Teflon® insulated conductors; Teflon® jacketed cable; sanitary process connection; maximum termination temperature 104°C (220°F)
- 67 – Sheath with cast aluminum head; 3/4" NPT conduit connection; ceramic terminal block; sanitary process connection; stainless steel sheath

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
- 14 – 316L Stainless steel

TEMPERATURE RANGE – Maximum Range

- 1 – -45 to 260°C (-50 to 500°F)
- 2 – -45 to 482°C (-50 to 900°F)

SHEATH LENGTH

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

LEADWIRE LENGTH

Style 58 only
X# - (e. g., X6 = 6 inch length)

OPTIONS

See accessories, pages 42 through 65.

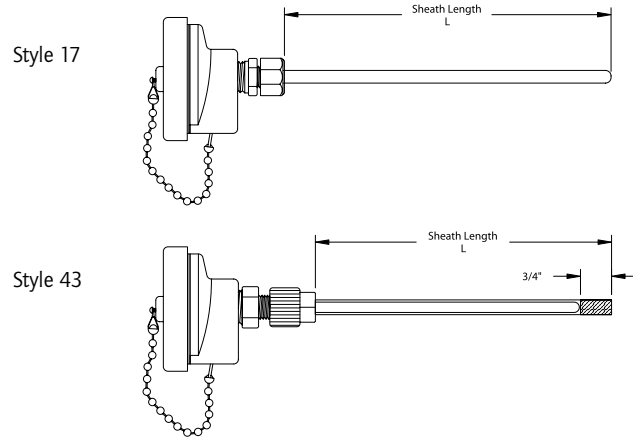


RTDs

RTDs

RTD WITH MINIATURE WEATHERPROOF HEAD -

Styles 17 and 43 (Teflon® Sleeve Optional)



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Options

SENSOR TYPE (Prefix "D" for dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction
- RTP4 – Platinum; DIN 0.00385; 1000 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP4A – Platinum; DIN 0.00385; 1000 ohm +/- 0.06% @ 0°C; 3 wire construction

ASSEMBLY STYLE

- 17 – Sheath with miniature weatherproof plastic head; 1/4" NPT conduit connection; molded in terminals; stainless steel compression fitting; gasketed screw cover with stainless steel chain; maximum termination temperature 177°C (350°F)
- 43 – Sheath with protective Teflon® sleeve; miniature weatherproof plastic head; 1/4" NPT conduit connection; molded in terminals; Teflon® compression fitting; gasketed screw cover with stainless steel chain; maximum termination temperature 177°C (350°F)

SHEATH DIAMETER (in inches)

- 6 – 3/16 (0.188)
Style 43 Finished OD = 0.240
- 7 – 1/4 (0.250)
Style 43 Finished OD = 0.300

SHEATH MATERIAL

- 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

- 1 – -45 to 260°C (-50 to 500°F)
- 2 – -45 to 482°C (-50 to 900°F)
Style 17 only

SHEATH LENGTH

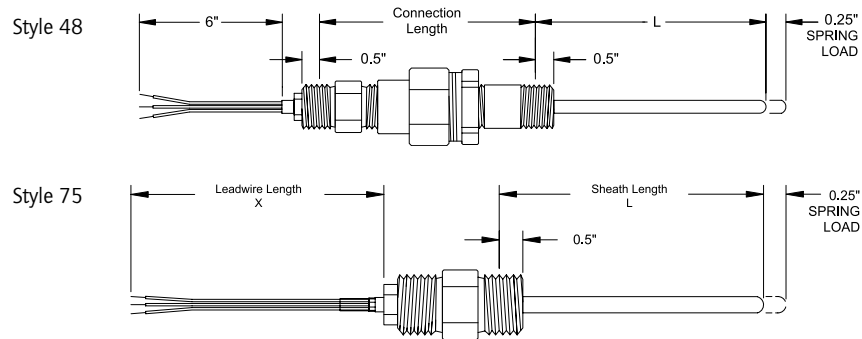
- L# - (e. g., L6 = 6 inch sheath,)

OPTIONS

- See accessories, pages 42 through 65.

RTD SHEATH WITH HEX CONNECTION, SPRING LOADED

Styles 48 and 75



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Connection	Connection Length	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE (Prefix "D" for Dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP5 – Platinum; AM 0.00392; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction

ASSEMBLY STYLE

- 48 – Sheath with connection hardware; spring loaded hex connector; no head; explosion proof union
- 75 – Sheath with double sided process mounting; Teflon® insulated conductors; 1/2" NPT stainless steel connection; spring loaded

CONNECTION (Style 48 only)

- N – 1/2" NPT Stainless steel hex fitting – (3/4" length below hex)
- NU – 1/2" NPT Stainless steel hex fitting with electro plate union - (2.5" length only)
- NUN – 1/2" NPT Stainless steel hex fitting with carbon steel electro plate union and carbon steel nipple
(Add suffix "1S" for 304 St/St nipple)

CONNECTION LENGTH (Style 48 only)

- ### - (e. g., 006 = 6 inch)
(3" minimum length, 6" standard length for NUN connection)

SHEATH DIAMETER (in inches)

- 7 – 1/4 (0.250)
- 9 – 3/8 (0.375)

SHEATH MATERIAL

- 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

- 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)
- Range 3 available only with RTP1 and RTP6 with Sheath Diameter #7 single element

SHEATH LENGTH

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

LEADWIRE LENGTH

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

OPTIONS

- See accessories, pages 42 through 65.



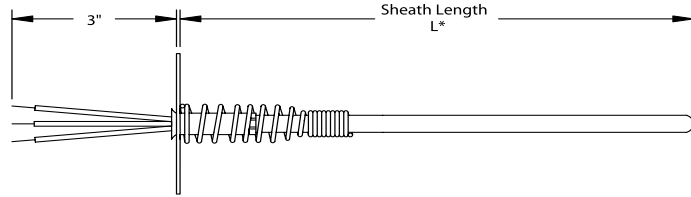
RTDs

RTDs

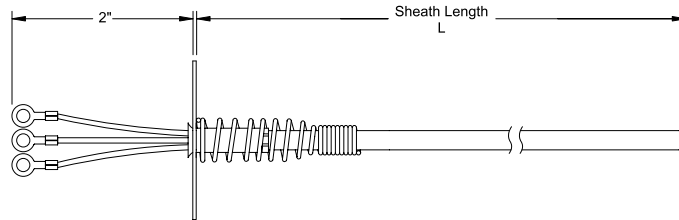
RTD SPRING LOADED REPLACEMENT ASSEMBLY

Styles 37 & 79X

Style 37



Style 79X



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Connection Length	Sheath Material	Temperature Range	Sheath Length	Options

SENSOR TYPE (Prefix "D" for Dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP5 – Platinum; AM 0.00392; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction

ASSEMBLY STYLE

- 37 – Sheath with spring loaded assembly; Teflon® insulated conductors; replacement element for use with styles 45 and 46 – Specify original probe specifications when ordering this replacement style.
- 79X – Sheath with spring loaded assembly; Teflon® insulated conductors; replacement element for use with style 77 – Specify original probe specifications when ordering this replacement style.

SHEATH DIAMETER (in inches)

- 6 – 3/16 (0.188)
- 7 – 1/4 (0.250)

SHEATH MATERIAL

- 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

- 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)

Range 3 available only with RTP1 and RTP6 with sheath diameter #7 single element

SHEATH LENGTH

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

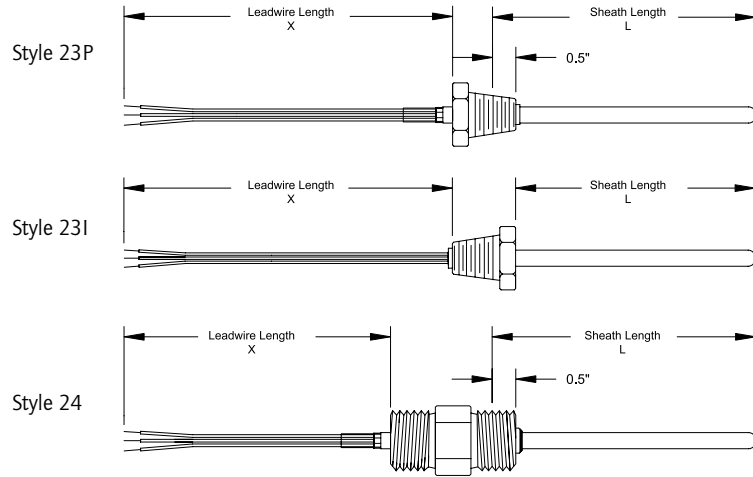
*Sheath length comprises installation length and connection length

OPTIONS

See accessories, pages 42 through 65.

RTD DOUBLE SIDED PROCESS MOUNTING OR SINGLE SIDED HEX MOUNTING

Styles 23P, 231, 24



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE (Prefix "D" for dual element)
RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction

ASSEMBLY STYLE
24 – Sheath with double sided mounting; Teflon® insulated conductors; 1/2" NPT stainless steel connection
 Can also be used as a replacement element for Styles 15, 16 and 78
23P – Sheath with single sided process mounting; Teflon® insulated conductors; 1/2" NPT stainless steel connection with leadwire
231 – Sheath with single sided instrument mounting; Teflon® insulated conductors; 1/2" NPT stainless steel connection with leadwire

SHEATH DIAMETER (in inches)
6 – 3/16 (0.188)
7 – 1/4 (0.250)
9 – 3/8 (0.375)

SHEATH MATERIAL
3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range
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)
 Range 3 available only with RTP1 and RTP6 with Sheath Diameter #7 single element

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

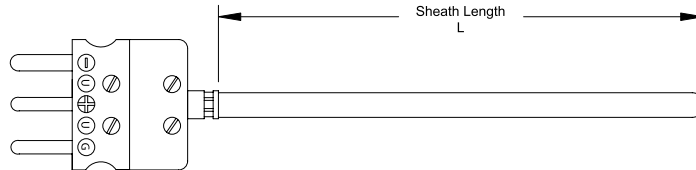
LEADWIRE LENGTH
 X# - (e. g., X72 = 72 inch length)

OPTIONS
 See accessories, pages 42 through 65.

RTD SHEATH WITH MALE PLUG

Style 14

Style 14



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Options

SENSOR TYPE

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction

ASSEMBLY STYLE

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

SHEATH DIAMETER (in inches)

- 6 – 3/16 (0.188)
- 7 – 1/4 (0.250)

SHEATH MATERIAL

- 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

- 1 – -45 to 260°C (-50 to 500°F)
- 2 – -45 to 482°C (-50 to 900°F)

SHEATH LENGTH

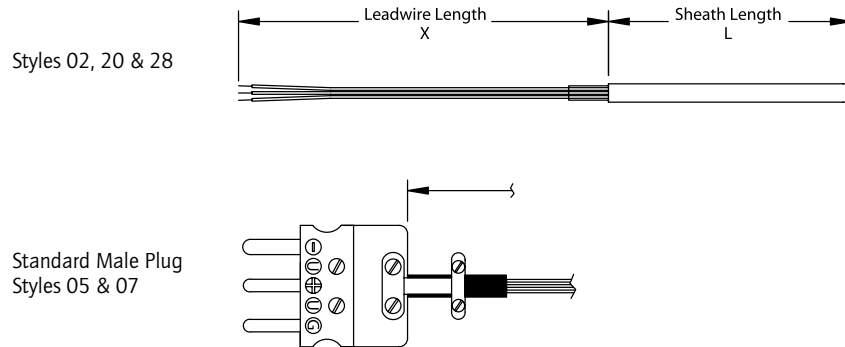
- L# - (e. g., L6 = 6 inch sheath L12.5 = 12.5 inch length)

OPTIONS

- See accessories, pages 42 through 65.

RTD SHEATH WITH LEADWIRE – Plugs, Overbraid and Teflon® Sleeve Optional

Styles 02, 05, 07, 20 & 28



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE (Prefix "D" for Dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP5 – Platinum; AM 0.00392; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction
- RTN1 – Nickel-Iron; Alpha 0.00518; 604 ohm +/- 0.5% @ 0°C; 2 wire construction
- RTC1 – Copper; Alpha 0.00427; 10 ohm +/- 0.2% @ 25°C; 3 wire construction

ASSEMBLY STYLE

- 02 – Sheath with leadwire; fiberglass insulated conductors
- 05 – Sheath with leadwire; Teflon® insulated conductors; standard male plug; 2 wire and 3 wire only (177°C "350F")
- 07 – Sheath with leadwire; Teflon® insulated conductors; overbraid; Teflon® jacket; standard male plug (177°C "350F")
- 20 – Sheath with leadwire; Teflon® insulated conductors; no jacket
- 28 – Sheath with Teflon® jacketed cable; Teflon® insulated conductors
- 69 – Sheath with leadwires; Insulated conductors, miniature plug

SHEATH DIAMETER (in inches)

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

SHEATH MATERIAL

- 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

- 1 – -45 to 260°C (-50 to 500°F)
- 2 – -45 to 482°C (-50 to 900°F)
- RTN1 limited to 232°C (450°F)
- RTC1 limited to Temp. Range 1

SHEATH LENGTH

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

LEADWIRE LENGTH

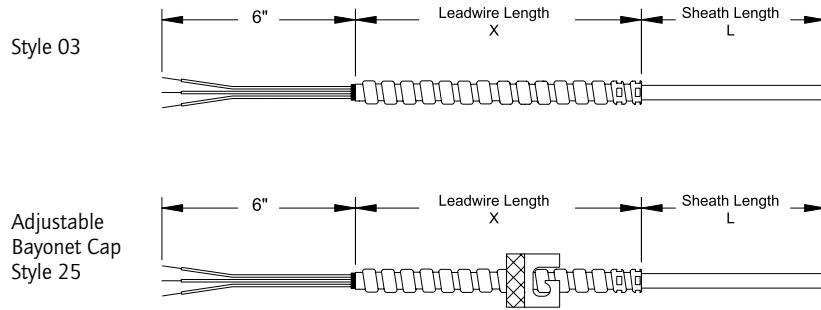
- X# - (e. g., X72 = 72 inch length)

OPTIONS

- See accessories, pages 42 through 65.

RTD SHEATH WITH LEADWIRE AND ARMOR CABLE

Styles 03 and 25



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE (Prefix "D" for Dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP5 – Platinum; AM 0.00392; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction
- RTN1 – Nickel-Iron; Alpha 0.00518; 604 ohm +/- 0.5% @ 0°C; 2 wire construction
- RTC1 – Copper; Alpha 0.00427; 10 ohm +/- 0.2% @ 25°C; 3 wire construction

ASSEMBLY STYLE

- 03 – Sheath with leadwire; Teflon® insulated conductors; flexible stainless steel armor cable
- 25 – Sheath with leadwire; adjustable bayonet cap; Teflon® insulated conductors; flexible stainless steel armor cable

SHEATH DIAMETER (in inches)

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

SHEATH MATERIAL

- 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

- 1 – -45 to 260°C (-50 to 500°F)
- 2 – -45 to 482°C (-50 to 900°F)
- RTN1 limited to 232°C (450°F)
- RTC1 limited to Temp. Range 1

SHEATH LENGTH

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

LEADWIRE LENGTH

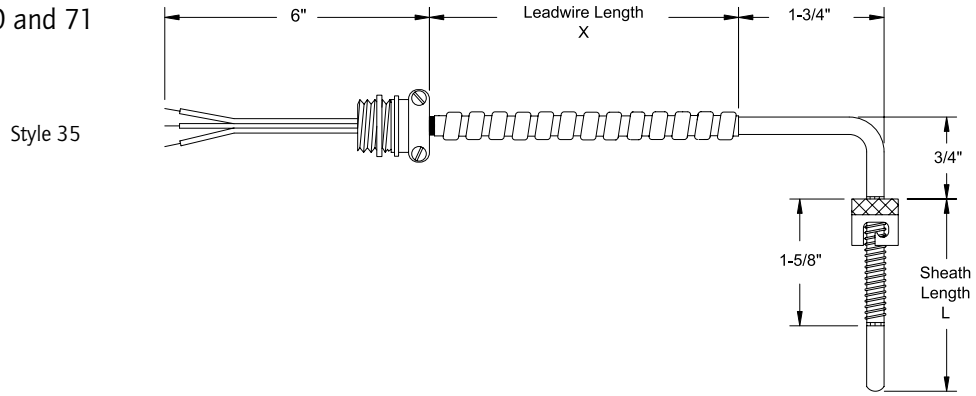
- X# - (e. g., X72 = 72 inch length)

OPTIONS

- See accessories, pages 42 through 65.

RTD SPRING LOADED BAYONET FITTING WITH ARMOR

Styles 35, 70 and 71



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

- SENSOR TYPE** (Prefix "D" for dual element)
RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction

- ASSEMBLY STYLE**
35 – Sheath with armor; Teflon® insulated conductors; spring loaded bayonet cap; 90 degree bend; 1/2" BX connector
70 – Sheath with armor; Teflon® insulated conductors; spring loaded bayonet cap; 45 degree bend; 1/2" BX connector
71 – Sheath with armor; Teflon® insulated conductors; spring loaded bayonet cap; no bend; 1/2" BX connector

SHEATH DIAMETER (in inches)
6 – 3/16 (0.188)

SHEATH MATERIAL
3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range
1 – -45 to 260°C (-50 to 500°F)
2 – -45 to 482°C (-50 to 900°F)

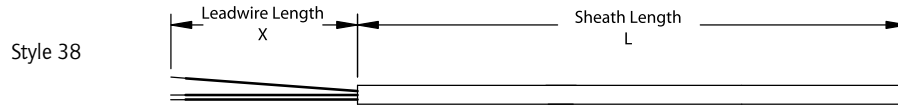
SHEATH LENGTH
L# - (e. g., L6 = 6 inch sheath)

LEADWIRE LENGTH
X# - (e. g., X6 = 6 inch length)

OPTIONS
 See accessories, pages 42 through 65.

RTD CUTABLE SHEATH WITH LEADWIRE

Style 38



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE (Prefix "D" for Dual element)

- RTP1** – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A** – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA** – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP5** – Platinum; AM 0.00392; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP6** – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7** – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction
- RTN1** – Nickel-Iron; Alpha 0.00518; 604 ohm +/- 0.5% @ 0°C; 2 wire construction
- RTC1** – Copper; Alpha 0.00427; 10 ohm +/- 0.2% @ 25°C; 3 wire construction

ASSEMBLY STYLE

- 38** – Field cuttable 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 (in inches)

- 6** – 3/16 (0.188)
- 7** – 1/4 (0.250)
- 8** – 5/16 (0.313)

SHEATH MATERIAL

- 3** – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

- 1** – -45 to 260°C (-50 to 500°F)
- 2** – -45 to 482°C (-50 to 900°F)
 RTN1 limited to 232°C (450°F)
 RTC1 limited to Temp. Range 1

SHEATH LENGTH

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

LEADWIRE LENGTH

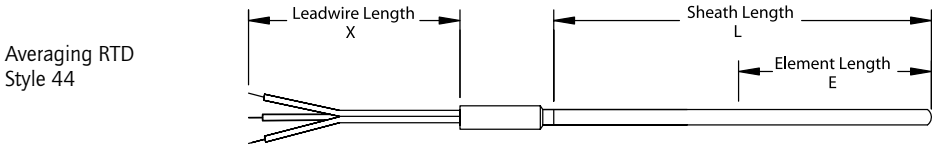
- X#** - (e. g., X72 = 72 inch length)

OPTIONS

- See accessories, pages 42 through 65.

AVERAGING RTDS

Style 44



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Element Length	Options

SENSOR TYPE
 RTP11 – Platinum, DIN 0.00385; 100 ohm +/- 0.5% @ 0°C;
 3 wire construction

ASSEMBLY STYLE
 44 – Averaging RTD; Sheath with leadwire; Teflon® insulated conductors; single element only

SHEATH DIAMETER (in inches)
 6 – 3/16 (0.188)
 7 – 1/4 (0.250)

SHEATH MATERIAL
 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range
 1 – -45 to 260°C (-50 to 500°F)
 2 – -45 to 482°C (-50 to 900°F)

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

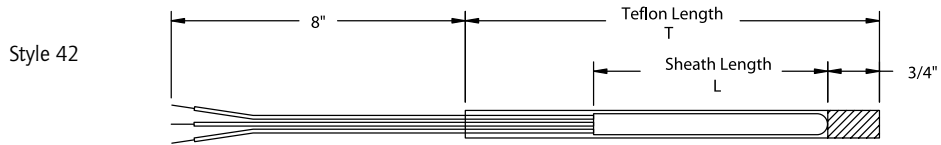
LEADWIRE LENGTH
 X# - (e. g., X72 = 72 inch length)

ELEMENT LENGTH
 E# - (e. g., E6 = 6 inch length)

OPTIONS
 See accessories, pages 42 through 65.

RTD SHEATH WITH LEADWIRE AND PROTECTIVE TEFLON® SLEEVE

Style 42



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Teflon Sleeve	Leadwire Length	Options

SENSOR TYPE (Prefix "D" for dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP5 – Platinum; AM 0.00392; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction
- RTN1 – Nickel-Iron; Alpha 0.00518; 604 ohm +/- 0.5% @ 0°C; 2 wire construction
- RTC1 – Copper; Alpha 0.00427; 10 ohm +/- 0.2% @ 25°C; 3 wire construction

ASSEMBLY STYLE

42 – Sheath with protective Teflon® sleeve, 8" Teflon® insulated leadwire extension beyond Teflon® sleeve

SHEATH DIAMETER (in inches)

- 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 – Maximum Range

- 1 – -45 to 260°C (-50 to 500°F)
- RTN1 limited to 232°C (450°F)

SHEATH LENGTH

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

TEFLON® SLEEVE

T# - (e. g., T6 = 6" of Teflon®, T12.5 = 12 1/2" of Teflon®)

LEADWIRE LENGTH

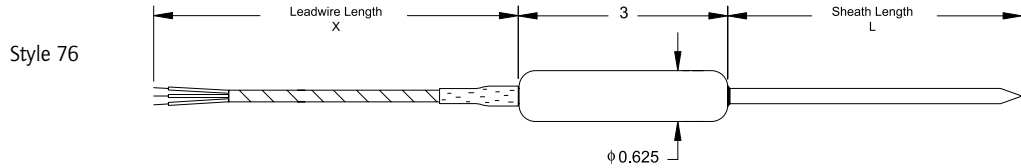
X# - (Only complete for length longer than standard 8")
(e. g., X12.5 = 12 1/2 inch length)

OPTIONS

See accessories, pages 42 through 65.

RTD PENETRATION PROBE TEFLON® JACKET LEADWIRE

Style 76



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
- RTP7 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 4 wire construction

ASSEMBLY STYLE

76 – Straight handle penetration probe with Teflon® jacketed leadwire; nylon handle (NSF Approved); maximum termination temperature 100°C (212°F)

SHEATH DIAMETER (in inches)

6 – 3/16 (0.188)

SHEATH MATERIAL

3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

1 – -45 to 260°C (-50 to 500°F)

SHEATH LENGTH

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

LEADWIRE LENGTH

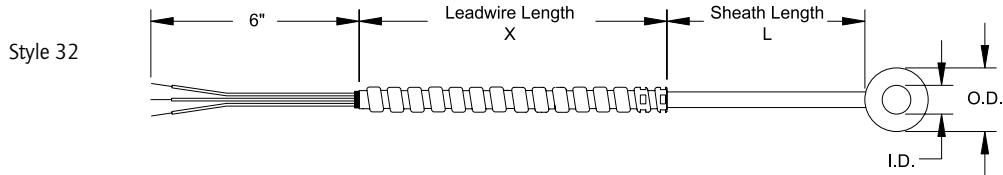
X# - (e. g., X72 = 72 inch length)

OPTIONS

See accessories, pages 42 through 65.

RTD WASHER STYLE WITH LEADWIRE

Styles 32 and 73



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Washer Size	Washer Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE (Prefix "D" for dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction

ASSEMBLY STYLE

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

WASHER SIZE (in inches)

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

WASHER MATERIAL

- 3 – 316 Stainless Steel

TEMPERATURE RANGE – Maximum Range

- 1 – -45 to 260°C (-50 to 500°F)
- 2 – -45 to 482°C (-50 to 900°F)

SHEATH LENGTH

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

LEADWIRE LENGTH

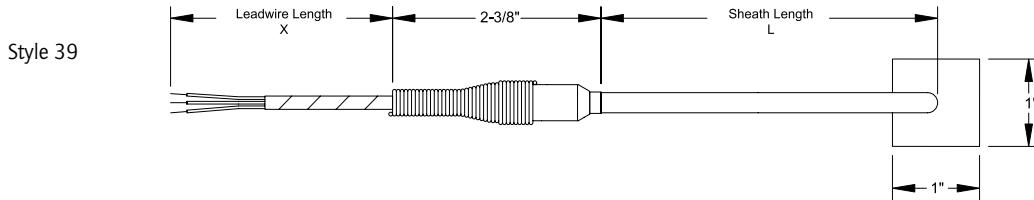
- X# - (e. g., X6 = 6 inch length)

OPTIONS

- See accessories, pages 42 through 65.

RTD WELD PAD WITH LEADWIRE

Style 39



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

- SENSOR TYPE** (Prefix "D" for dual element)
RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C;
 3 wire construction
RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C;
 3 wire construction
RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C;
 3 wire construction
RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C;
 2 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 (See page 43)

- SHEATH DIAMETER** (in inches)
6 – 3/16 (0.188)
7 – 1/4 (0.250)

SHEATH MATERIAL
3 – 316 Stainless Steel

- TEMPERATURE RANGE** – Maximum Range
1 – -45 to 260°C (-50 to 500°F)
2 – -45 to 482°C (-50 to 900°F)

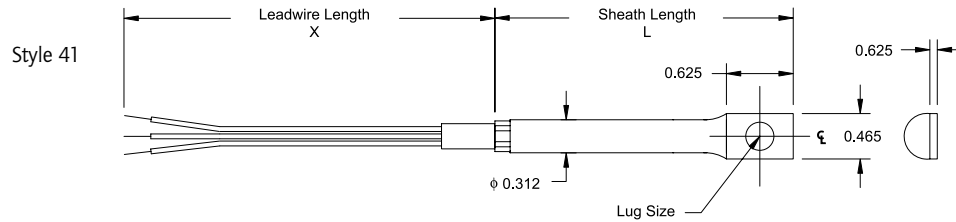
SHEATH LENGTH
 L# - (e. g., L6 = 6 inch sheath)

LEADWIRE LENGTH
 X# - (e. g., X6 = 6 inch length)

OPTIONS
 See accessories, pages 42 through 65.

RTD MOUNTING LUG WITH LEADWIRE

Style 41



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Lug Hole Size	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE (Prefix "D" for dual element)

- RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
- RTP1A – Platinum; DIN 0.00385; 100 ohm +/- 0.06% @ 0°C; 3 wire construction
- RTP1AA – Platinum; DIN 0.00385; 100 ohm +/- 0.01% @ 0°C; 3 wire construction
- RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction

ASSEMBLY STYLE

- 41F – Stainless steel mounting lug with fiberglass leadwire; diameter 0.312" only
- 41T – Stainless steel mounting lug with Teflon® leadwire; diameter 0.312" only

LUG HOLE SIZE

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

TEMPERATURE RANGE – Maximum Range

- 1 – -45 to 260°C (-50 to 500°F)
- 2 – -45 to 482°C (-50 to 900°F)

SHEATH LENGTH

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

LEADWIRE LENGTH

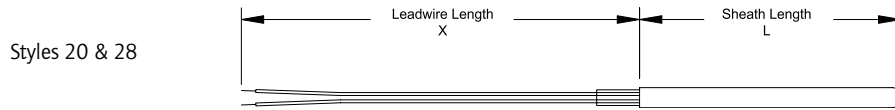
X# - (e. g., X6 = 6 inch length)

OPTIONS

See accessories, pages 42 through 65.

THERMISTORS - SHEATH WITH LEADWIRE

Styles 20 & 28



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. There are some limitations on sensor type, assembly style, and sheath diameter combinations.

Sensor Type	Assembly Style	Sheath Diameter	Sheath Material	Temperature Range	Sheath Length	Leadwire Length	Options

SENSOR TYPE

- TH1 – Thermistor; 10,000 ohms @ 25°C; Tolerance +/- 5%
- TH2 – Thermistor; 10,000 ohms @ 25°C; Tolerance +/- 2%
- TH3 – Thermistor; 100,000 ohms @ 25°C; Tolerance +/- 0.2°C from 0 to 70° C; Temperature range #1 only
- TH4 – Thermistor; 100,000 ohms @ 25°C; Tolerance +/- 5%
- TH5 – Thermistor; 5,000 ohms @ 25°C; Tolerance +/- 0.2°C from 0°C to 70°C; temperature range #1 only
- TH7 – Thermistor; 2,252 ohms @ 25°C; Tolerance +/- 5%; Temperature range #1 only

ASSEMBLY STYLE

- 20 – Sheath with leadwire; Teflon® insulated conductors
- 28 – Sheath with Teflon® jacketed cable; Teflon® insulated conductors

SHEATH DIAMETER (in inches)

- 6 – 3/16 (0.188)
- 7 – 1/4 (0.250)

SHEATH MATERIAL

- 3 – 316 Stainless steel

TEMPERATURE RANGE – Maximum Range

- 1 – -45 to 150°C (-50 to 300°F)
- 2 – -45 to 260°C (-50 to 500°F)

SHEATH LENGTH

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

LEADWIRE LENGTH

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

OPTIONS

See accessories, pages 42 through 65.



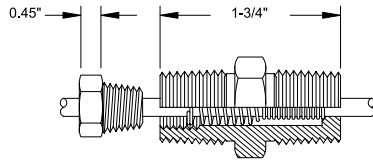
Options

Options

FITTING OPTIONS

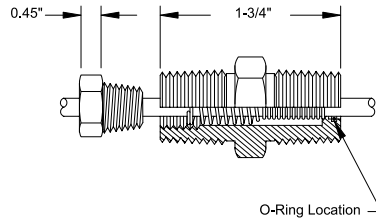
Spring Loaded Hex Connectors

STANDARD, NON-SEALED



Option Code	Process Connection	Conduit Connection	Sensor Size
PF13	1/2" NPT	1/2" NPT	3/16"
PF14	1/2" NPT	1/2" NPT	1/4"
PF17	3/4" NPT	3/4" NPT	3/16"
PF18	3/4" NPT	3/4" NPT	1/4"

O-RING SEAL



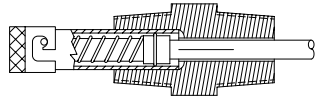
Option Code	Process Connection	Conduit Connection	Sensor Size
PF21	1/2" NPT	1/2" NPT	3/16"
PF22	1/2" NPT	1/2" NPT	1/4"
PF25	3/4" NPT	1/2" NPT	3/16"
PF26	3/4" NPT	3/4" NPT	1/4"

Installation not recommended for high pressure system. Consult factory for optional design.

Maximum pressure rating to 15 psi.

Buna N O-ring temperature range -23 to 93°C (-10 to 200°F)

BAYONET CAP

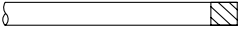

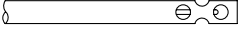



Option Code	Process Connection	Conduit Connection	Sensor Size
PF29	1/2" NPT	1/2" NPT	3/16"
PF30	1/2" NPT	1/2" NPT	1/4"

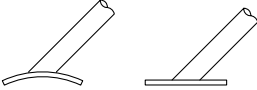
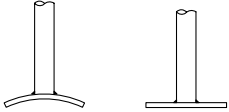
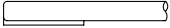
TIP CONFIGURATION OPTIONS

Applied Sensor Technologies offers several specific sensing tip configurations, each designed to enhance your exact application performance need.

GENERAL

	OPTION CODE	DESCRIPTION
	PS01	Copper Tip
	PS02	Point tip for piercing
	PS03	Perforated housing for air flow sensing
	PS04	Flat tip

WELD PAD ASSEMBLIES

	OPTION CODE	DESCRIPTION		
	PW45F	45 degree angle, flat weld pad	To change a flat pad to a radius, add suffix code from below. Example PW45R10	
	PW45R	45 degree angle, rounded weld pad		
	PW90	90 degree angle, perpendicular weld pad	Code	
			Nominal pipe size	
			R10	1"
			R15	1.5"
			R20	2.0"
			R25	2.5"
R30	3.0"			
R35	3.5"			
R40	4.0"			
	PW00	Horizontal weld pad		



Options

Options

GENERAL TERMINATIONS

SPADE AND PUSH-ON TERMINALS

OPTION CODE	DESCRIPTION
PT02	#6 Spade terminals; plated copper
PT03	#8 Spade terminals; plated copper
PT02-Ch	#6 Spade terminals - Chromel
PT02-Al	#6 Spade terminals - Alumel
PT02-Fe	#6 Spade terminals - Iron
PT02-Co	#6 Spade terminals- Constantan (Other calibrations available)
PT04	1/4" Push-on terminals; plated copper; fully insulated

PT02 to
PT02-CO



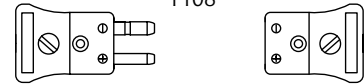
PT04



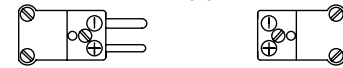
PLUGS AND JACKS

OPTION CODE	DESCRIPTION
PT05	Standard quick disconnect plug; 350°F (177°C) continuous; 2 pins. Specify calibration (J, K, T, or E)
PT05-3	Standard quick disconnect plug; 350°F (177°C) continuous; 3 pins; for RTD - Copper pins
PT06	Standard quick disconnect jack; 350°F (177°C) continuous; 2 receptacles. Specify calibration (J, K, T, or E)
PT06-3	Standard quick disconnect jack; 350°F (177°C) continuous; 3 receptacles; for RTD - Copper sockets
PT07	High temperature quick disconnect plug; 500°F (260°C) continuous; 2 pins. Specify calibration (J, K, T, or E)
PT08	High temperature quick disconnect jack; 500°F (260°C) continuous; 2 receptacles. Specify calibration (J, K, T, or E)
PT09	Miniature quick disconnect plug; 350°F (177°C) continuous; 2 pins. Specify calibration (J, K, T, or E)
PT09-3	Miniature quick disconnect plug; 350°F (177°C) continuous; 3 pins; for RTD - Copper pins
PT10	Miniature quick disconnect jack; 350°F (177°C) continuous; 2 receptacles. Specify calibration (J, K, T or E)
PT10-3	Miniature quick disconnect jack; 350°F (177°C) continuous; 3 receptacles; for RTD - Copper sockets

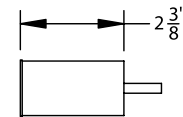
PT05 to
PT08



PT09 to
PT10-3



PA9



PA10



PA11



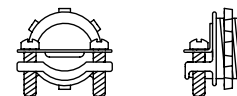
TUBING ADAPTERS FOR PLUG AND JACK

OPTION CODE	DESCRIPTION
PA9	Rubber boot for use with PT05 to PT08
PA10	Cable clamp used to attach terminal plugs (PT05 to PT08) to cable leads
PA11	Neoprene bushing insert for use with PA10 to prevent wire abrasion

BX CONNECTORS

OPTION CODE	DESCRIPTION
PC01	BC connector and lock nut for 1/2" NPT knockout
PC02	BX connector and lock nut for 3/4" NPT knockout

PC01 & PC02



Options

OPTIONAL MATERIALS

For many styles, additional sheath materials are available. The "3" in the part number for 316 stainless may be replaced with the following codes. Note that lead times may be affected by these choices, and some combinations of material, sheath diameter and other factors may not be available. Consult Applied Sensor Technologies for additional materials and information.

- 1** = 304 stainless steel
- 11** = 304L stainless steel
- 5** = Inconel® 600
- 7** = Copper
- 12** = Hastelloy® C
- 16** = Alloy HR160

OPTIONAL SHEATH DIAMETERS

Additional sheath diameters may be available for each style, depending on the type of sensor. RTDs and thermistors tend to be more limited due to their size. These codes may be substituted into the part number in most cases. Consult Applied Sensor Technologies for additional materials and information.

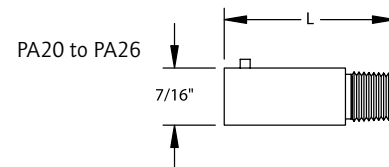
- 1** = 1/32" (0.032") – thermocouples only
- 3** = 1/16" (0.063") – thermocouples only
- 4** = 1/8" (0.125") – thermocouples only
- 5** = 5/32" (0.156") – thermocouples only
- 6** = 3/16" (0.188")
- 9** = 3/8" (0.375")
- 10** = 1/2" (0.500")
- 17** = 3/4" (0.750")
- 18** = 1" (1.000")

ADAPTER OPTIONS

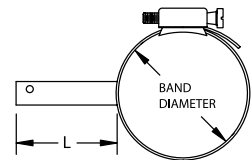
For use with bayonet style thermocouples and RTDs, these bayonet adapters allow temperature measurement without tapping or drilling. They are cost-effective, easy to use and simple to replace.

BAYONET ADAPTERS

OPTION CODE	THREAD SIZE	LENGTH (L)	MATERIAL
PA20	1/8" – 27 NPT	7/8"	Plated Steel
PA21	1/8" – 27 NPT	1"	Plated Steel
PA22	1/8" – 27 NPT	1 1/2"	Plated Steel
PA23	1/8" – 27 NPT	2"	Plated Steel
PA24	1/8" – 27 NPT	2 1/2"	Plated Steel
PA25	1/8" – 24 NPT	7/8"	Plated Steel
PA26	1/8" – 24 NPT	1 1/2"	Plated Steel



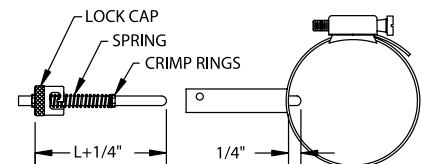
PA30 (PA30-CA) to
PA37 (PA37-CA)



PIPE CLAMP WITH BAYONET ADAPTER

PIPE CLAMP WITH BAYONET ADAPTER

OPTION CODE	BAND DIAMETER	ADAPTER LENGTH ("L" Dimension)
PA30 (PA30-CA)	1 1/4" to 2 1/4"	1"
PA31 (PA31-CA)	1 1/4" to 2 1/4"	2"
PA32 (PA32-CA)	2 1/4" to 3 1/4"	1"
PA33 (PA33-CA)	2 1/4" to 3 1/4"	2"
PA34 (PA34-CA)	3 1/4" to 4 1/4"	1"
PA35 (PA35-CA)	3 1/4" to 4 1/4"	2"
PA36 (PA36-CA)	4 1/4" to 5"	1"
PA37 (PA37-CA)	4 1/4" to 5"	2"



PIPE CLAMP WITH BAYONET ADAPTER
(COMPLETE ASSEMBLY)



Options

Options

LEADWIRE CONFIGURATION OPTIONS

Leadwire insulation and protective coverings are for use with all sensor styles that utilize leadwires.

LEADWIRE INSULATION

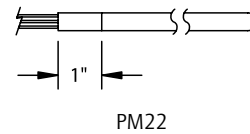
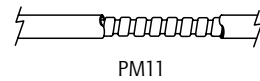
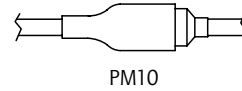
OPTION CODE	DESCRIPTION
T	Teflon® insulation
F	Fiberglass insulation
P	PVC insulation
MT	Mylar shield/drain with Teflon® insulation
MP	Mylar shield/drain with PVC insulation

PROTECTIVE COVERING

OPTION CODE	DESCRIPTION
A	Flexible stainless steel armor cable
S	Flexible stainless steel overbraid
SJC	Plated copper braided shield cable with Teflon® jacket
JC	Jacketed cable

ASSEMBLY OPTIONS

OPTION CODE	DESCRIPTION
PM45	45 degree bend. Specify length from the tip in inches, e.g., PM45-6
PM90	90 degree bend. Specify length from the tip in inches, e.g., PM90-8
PM02	Stainless steel tag with stainless steel wire
PM03	High temperature powder fill
PM04	Aluminum oxide insulation
PM05	1/4" NPT Process connection
PM06	3/4" NPT Process connection
PM07	1" NPT Process connection
PM08	1/2" NPT Conduit connection
PM09	1" NPT Conduit connection
PM10	PVC strain relief for transition
PM11	PVC coating for armor cable
PM12	High temperature for general purpose thermocouples; max. 900 °F (481 °C)
PM14	Moisture sealed lead exit
PM22	Size on size transition for MI thermocouples
PM30	Special text notations option; provide details in text (e.g., critical temperature and tolerance)
PM32	RTD Matched elements. Specify calibration point(s); minimum purchase one pair (2 units)
PM33	Calibration service; NIST traceable. Specify point(s)



SMART TRANSMITTER

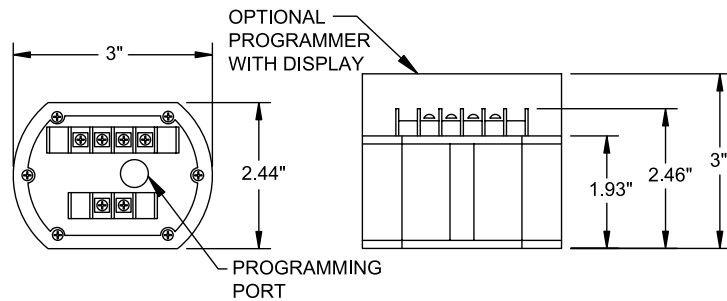
Specifications

Inputs:	Thermocouple: Types E, J, K and T RTD: 2, 3 and 4 wire, Pt100 (DIN and NIST curves); Ni 100, Cu 10 and other RTDs DC mV, AC volts, AC amps, Frequency/pulse also available (consult AST)
Maximum Range:	Limited by signal quality only
Outputs:	4 to 20 mA isolated analog current loop standard. Digital communication, Hart® protocol available (consult AST)
Supply:	12 to 45 VDC @ load; reverse polarity protected
Operating Conditions:	-20 to 70°C; 0 to 95% RH, non-condensing
Storage Temperature:	-55 to 125°C
Response time:	0.5 seconds to 99% of reading (2 updates per second)
Long term stability:	< +/- 0.1% of span for 6 months
Isolation:	800 VDC or peak AC
RFI/EMI immunity:	Tested per SAMA PMC 33.1 from 20-1000 MHz; for field strength to 30V/m
Enclosure:	Extruded anodized aluminum
Analog output resolution:	0.025% of span (+/-4 mA)
Analog output (D/A) linearity:	+/-0.025% of span
Digital sensor linearization:	< +/-0.02°C for Pt-100 RTD; < +/-0.1°C for thermocouples
Cold junction compensation:	Automatically corrected to within < +/-0.3°C for all thermocouple types
Temperature stability:	Zero: +/-0.003% per °C of span Span: +/-0.005% per °C of span
Supply voltage effect:	< +/-0.001% per volt
Calibration:	Automatic; includes all of the calibration parameters: span, zero, self-test and auto calibration. No field calibration required

How to Order

Select the Code from below based on input. Specify temperature range and units of measure (°C or °F). Example: TC4 0-100°F

Code	Description
TC4	Smart, Two wire transmitter; thermocouple input
RTD4	Smart, Two wire transmitter; RTD input



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Accessories

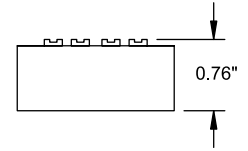
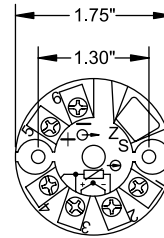
Accessories

UNIVERSAL, FULLY-LINEARIZED TEMPERATURE TRANSMITTERS

These microprocessor-based units are fully-isolated and linearized. They have high RFI/EMI-immunity; high accuracy (0.1%) and a small size.

Specifications

Input:	K, T, E, J thermocouple; Pt100, 500Ω, Nickel & 10Ω Copper RTDs, MV & ohms
Minimum Span:	See HOW TO ORDER
Output:	4-20 mA or 20-4 mA
Linearization:	On / Off
Supply:	10-40 VDC, polarity protected
Supply Effect:	0.001%/V
Max Ripple:	10 V PP. Min Vbat=10 Vdc
Zero Drift:	± 0.01%/°C or ±0.02 °C/°C
Span Drift:	± 0.005%/°C or ±0.01 °C/°C
Long Term Drift:	± 0.05%/Year
Cold Junction Drift:	± 0.01 °C/°C
Excitation Current, RTD:	0.1 mA
Sensor Lead Resistance, RTD:	500 Ohm max.
Sensor Lead Resistance Effect:	0.001 °C/Ohm
Sensor Lead Resistance, T/C:	10,000 Ohm max.
Open Circuit Detection:	Upscale / Downscale
Load Capability:	Vbat-10V / 20 mA
Startup Time:	20 sec.
Warm-up Time:	5 Min.
Isolation:	500 VDC.
Ambient Operating Temp.:	-30 to + 85°C
Storage Temperature:	-40 to +100°C
Housing Material:	Zinc Alloy (ZAMAK 5) epoxy coated



How to Order

Select the Code from below based on input. For factory calibration, specify temperature range, sensor type and units of measure (°C or °F). Example: UNI5-S-0-200°F-J

Code	Description
UNI5-S	Two wire transmitter; Universal input; isolation 500 VDC or peak AC; adjustable +/- 25% for both zero and span (Single T/C or Single RTD only)
UNI5-D	Two wire transmitter; Universal input; 2000 Volts I/O Isolation. Full software programmability of sensor type and input range. (For dual T/C or dual RTD)

TWO WIRE TEMPERATURE TRANSMITTERS

These 2 wire, 4 - 20 mA temperature transmitters can be ordered as a stand-alone item, or for use in an assembly. They are an economical choice, providing small size for compact packaging.

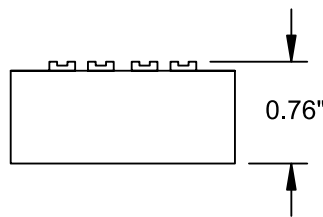
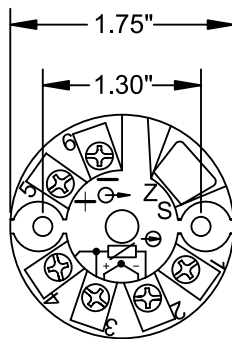
Specifications

Output span:	4 to 20 mA, limiting @ <28 mA
Input:	RTD: Pt 100; 2 or 3 wire connection TC: J, K, T and E calibration
Input span:	RTD: - 20°C min., 500°C max.; TC: 36°F min., 900°F max. 10 mV minimum span
Burnout Detection:	Upscale Standard
Supply voltage:	10 to 36 VDC polarity protected
Maximum load:	$R_{max} = (V_{supply} - 8 \text{ volts}) / 20 \text{ mA}$
Ambient temperature:	-20° to 70°C
Humidity:	0 to 95% RH, non-condensing
Linearity:	Isolated RTD: < +/- 0.05% of span referred to sensor temperature Isolated TC/mV: < +/- 0.03% of span referred to mV input level Non-isolated RTD: < +/- 0.1% of span referred to sensor temperature Non-isolated TC/mV: < +/- 0.1% of span referred to mV input level
Stability:	Isolated RTD (100°C span): 0.03% of span per °C Isolated TC/mV (25mV input): 0.04% of span per °C. Non-isolated RTD (100°C span): 0.02% of span per °C Non-isolated TC/mV (25mV input): 0.02% of span per °C
Reference junction compensation:	TC: 0.05°C per °C of ambient temperature

How to Order

Select the Code from below based on isolation and input. Specify temperature range and units of measure (°C or °F). Example: TC2 0-100°F

Code	Description
TC1	Two wire transmitter; thermocouple input; isolation 500 VDC or peak AC; adjustable +/- 25% for both zero and span
RTD1	Two wire transmitter; RTD input; isolation 500 VDC or peak AC; adjustable +/- 25% for both zero and span
TC2	Two wire transmitter; thermocouple input; non-isolated
RTD2	Two wire transmitter; RTD input; non-isolated





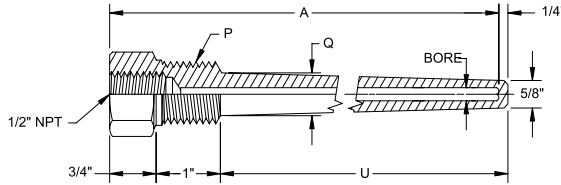
Accessories

Accessories

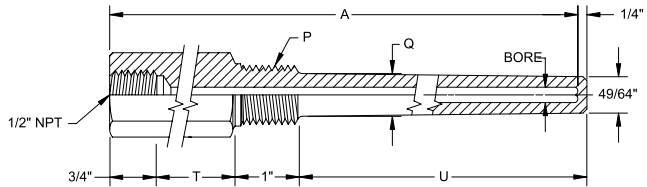
TAPERED STEM NPT THERMOWELLS

Solid-bore Thermowells - Styles H260, HL260, H385 and HL385

Styles H260, H385



Styles HL260, HL385



How to Build a Part Number

To order, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Process Connection	Style Number	Stem Length	"T" Lag Extension	Well Material	Options

PROCESS CONNECTION (P)

2 = 3/4" NPT (Q= 7/8")

3 = 1" NPT (Q= 1-1/16")

STYLE NUMBER

H260 = 0.260" bore, tapered stem, no lag

HL260 = 0.260" bore, tapered stem, with lag

H385 = 0.385" bore, tapered stem, no lag

HL385 = 0.385" bore, tapered stem, with lag

STEM LENGTH (A) (in inches)

L4 = 4" (U=2.5")

L6 = 6" (U=4.5")

L9 = 9" (U=7.5")

L12 = 12" (U=10.5")

L15 = 15" (U=13.5")

L18 = 18" (U=16.5")

L24 = 24" (U=22.5")

(for styles H260 & H385, T=0")

LAG EXTENSION (T) (in inches)

T2 = 2

T3 = 3

(Add U + T + 1.50 to get "A" dimension)

WELL MATERIAL

No code = 304 stainless steel

316 = 316 stainless steel

OPTIONS

PW01 = Cap and chain assembly

PM02 = Stainless steel tag and wire

Note - If combining with a temperature sensor assembly, Thermowell Stem length "A" = Sensor "L" dimension



Accessories

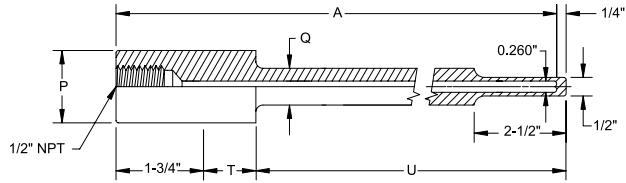
Accessories

SOCKET WELD THERMOWELLS

Solid-bore Thermowells - Styles SW260, SWL260, SW385 and SWL385

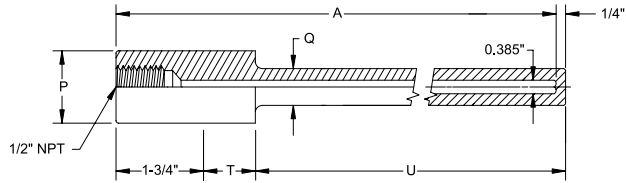
Style SW260
(Without T Dim.)

Style SWL260



Style SW385
(Without T Dim.)

Style SWL385



How to Build a Part Number

To order, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Process Connection	Style Number	Stem Length	"T" Lag Extension	Well Material	Options

PROCESS CONNECTION (P)

2 = 3/4" pipe, OD = 1.05" (Q = 3/4" for 0.260 bore; 49/64" for 0.385 bore)

3 = 1" pipe, OD = 1.315" (Q = 7/8")

STYLE NUMBER

SW260 = 0.260" bore, stepped stem, no lag

SWL260 = 0.260" bore, stepped stem, with lag

SW385 = 0.385" bore, straight stem, no lag

SWL385 = 0.385" bore, straight stem, with lag

STEM LENGTH (A) (in inches)

L4 = 4" (U=2.5")

L6 = 6" (U=4.5")

L9 = 9" (U=7.5")

L12 = 12" (U=10.5")

L15 = 15" (U=13.5")

L18 = 18" (U=16.5")

L24 = 24" (U=22.5")

(for styles SW260 & SW385, T=0")

LAG EXTENSION (T) (in inches)

T2 = 2

T3 = 3

(Add U + T + 1.50 to get "A" dimension)

WELL MATERIAL

No code = 304 stainless steel

316 = 316 stainless steel

OPTIONS

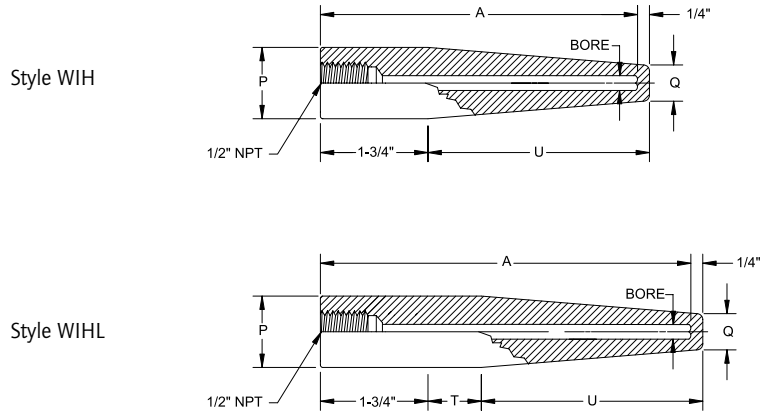
PW01 = Cap and chain assembly

PM02 = Stainless steel tag and wire

Note -If combining with a temperature sensor assembly, Thermowell Stem length "A" = Sensor "L" dimension

WELD-IN THERMOWELLS

Solid-bore Thermowells - Styles WIH260, WIHL260, WIH385 and WIHL385



How to Build a Part Number

To order, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Process Connection	Style Number	Stem Length	"T" Lag Extension	Well Material	Options

PROCESS CONNECTION (P)

2 = 3/4" pipe, OD = 1.05" (Q = 5/8" for 0.260 bore; 49/64" for 0.385 bore)

3 = 1" pipe, OD = 1.315" (Q = 5/8" for 0.260 bore; 49/64" for 0.385 bore)

STYLE NUMBER

- WIH260 = 0.260" bore, tapered stem, no lag
- WIHL260 = 0.260" bore, tapered stem, with lag
- WIH385 = 0.385" bore, tapered stem, no lag
- WIHL385 = 0.385" bore, tapered stem, with lag

STEM LENGTH (A) (in inches)

- L4 = 4" (U=2.5")
- L6 = 6" (U=4.5")
- L9 = 9" (U=7.5")
- L12 = 12" (U=10.5")
- L15 = 15" (U=13.5")
- L18 = 18" (U=16.5")
- L24 = 24" (U=22.5")
- (for styles WIH260 & WIH385, T=0")

LAG EXTENSION (T) (in inches)

- T2 = 2
- T3 = 3
- (Add U + T + 1.50 to get "A" dimension)

WELL MATERIAL

- No code = 304 stainless steel
- 316 = 316 stainless steel

OPTIONS

- PW01 = Cap and chain assembly
- PM02 = Stainless steel tag and wire

Note - If combining with a temperature sensor assembly, Thermowell Stem length "A" = Sensor "L" dimension



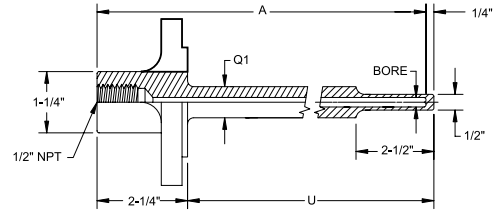
Accessories

Accessories

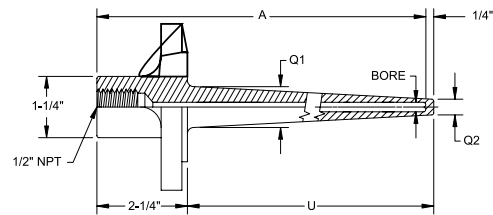
FLANGED THERMOWELLS

Solid-bore Thermowells - Styles F260, FH260, F385 and FH385

Style F260



Style FH260
Style FH385



How to Build a Part Number

To order, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Style Number	Insert Length	Well Material	Flange Size	Flange Rating	Flange type	Options

STYLE NUMBER

- F260 = 0.260" bore, stepped stem
- FH260 = heavy duty, 0.260" bore, tapered stem, 5/8" tip diameter (Q2)
- F385 = 0.385" bore, straight stem (not shown)
- FH385 = heavy duty, 0.385" bore, tapered stem, 49/64" tip diameter (Q2)

INSERT LENGTH (U) (in inches)

- U4 = 4" (A = 6")
- U7 = 7" (A = 9")
- U10 = 10" (A = 12")
- U13 = 13" (A = 15")
- U16 = 16" (A = 18")
- U22 = 22" (A = 24")

WELL AND FLANGE MATERIAL

- No code = 304 stainless steel
- 316 = 316 stainless steel

FLANGE SIZE

- 1 = 1" flange
- 1.5 = 1-1/2" flange

(FLANGE SIZE CONTINUED)

- 2 = 2" flange
 - 3 = 3" flange
 - 4 = 4" flange
- (Stem diameter (Q1) = F260 (3/4"); F385 (7/8"); FH260 and FH385) (7/8" for 1" flange, 1-1/16" for all others)

FLANGE RATING

- 150 = 150# flange
- 300 = 300# flange
- 600 = 600# flange
- 900/1500 = 900/1500# flange

FLANGE TYPE

- RF = Raised face (standard)
- FF = Flat face
- RTJ = Ring type joint

OPTIONS

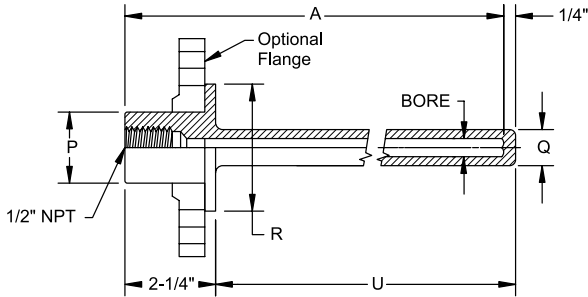
- PW01 = Cap and chain assembly
- PM02 = Stainless steel tag and wire

Note - If combining with a temperature sensor assembly, Thermowell Stem length "A" = Sensor "L" dimension

VAN STONE THERMOWELLS

Solid-bore Thermowells - Styles VS260 and VS385

Style VS260
Style VS385



How to Build a Part Number

To order, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Process Connection	Style Number	Insert 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 NUMBER

- VS260 = 0.260" bore, straight stem (Q = 3/4")
- VS385 = 0.385" bore, straight stem (Q = 7/8")

INSERT LENGTH (U) (in inches)

- U2 = 2" (A = 4")
- U4 = 4" (A = 6")
- U7 = 7" (A = 9")
- U10 = 10" (A = 12")
- U13 = 13" (A = 15")
- U16 = 16" (A = 18")
- U22 = 22" (A = 24")

WELL MATERIAL

- No code = 304 stainless steel
- 316 = 316 stainless steel

FLANGE MATERIAL (OPTIONAL)

Specify flange material by entering material name (e.g., Monel®, brass, etc.)

FLANGE RATING

- 150 = 150# flange
- 300 = 300# flange
- 600 = 600# flange
- 900/1500 = 900/1500# flange

OPTIONS

- PW01 = Cap and chain assembly
- PM02 = Stainless steel tag and wire

Note - If combining with a temperature sensor assembly, Thermowell Stem length "A" = Sensor "L" dimension

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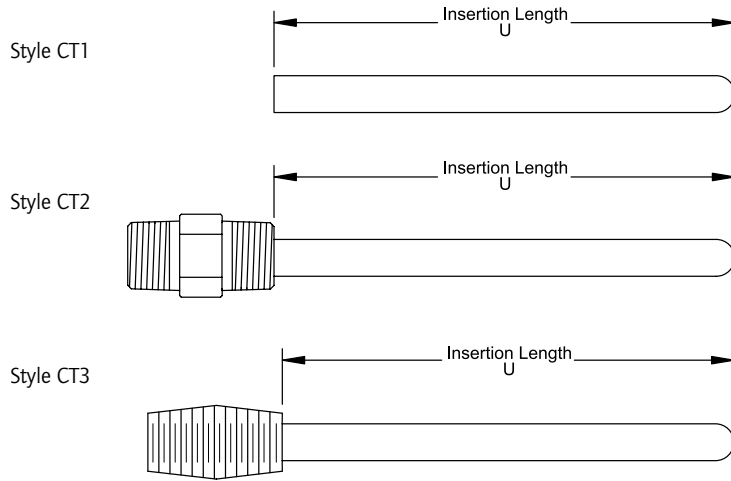


Accessories

Accessories

CERAMIC PROTECTION TUBES

Styles CT1, CT2 and CT3



How to Build a Part Number

To order, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Style Number	Tube Diameter	Tube Material	Instrument Connection	Process Connection	Connection Material	Insertion Length

STYLE NUMBER

- CT1 = Ceramic protection tube; no hex
- CT2 = Ceramic protection tube with threaded hex fitting
- CT3 = Ceramic protection tube with 3" long pipe nipple

TUBE DIAMETER (in inches)

- 9 = 3/8" O.D. X 1/4" I.D.
- 17 = 3/4" O.D. X 1/2" I.D.
- 18 = 1" O.D. X 3/4" I.D.
- 19 = 1-1/4" O.D. X 1" I.D.
- 20 = 11/16" O.D. X 7/16" I.D.

TUBE MATERIAL

- A = Alumina (1871°C)
- M = Mullite (1482°C)

INSTRUMENT CONNECTION

(Leave blank for CT1)

- 1 = 1/2" NPT
- 2 = 3/4" NPT
- 3 = 1" NPT

PROCESS CONNECTION

(Leave blank for CT1)

- 1 = 1/2" NPT
- 2 = 3/4" NPT
- 3 = 1" NPT

CONNECTION MATERIAL

(Leave blank for CT1)

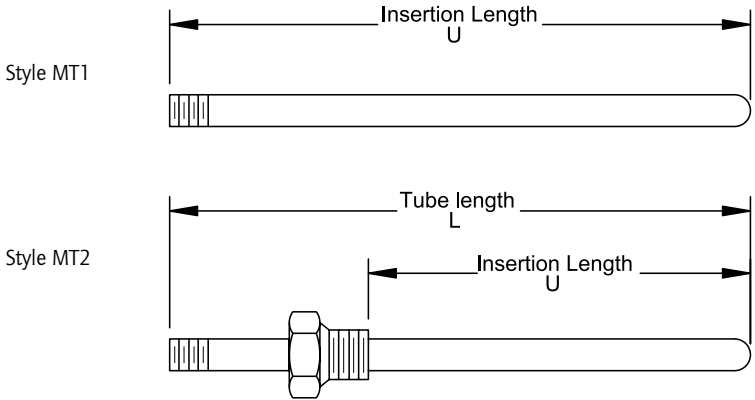
- No code = 304 Stainless steel
- 316 = 316 Stainless steel

INSERTION LENGTH

U# = (e.g., U6 = 6" below connector)

METAL PROTECTION TUBES

Styles MT1 and MT2



How to Build a Part Number

To order, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Style Number	Pipe Size	Pipe Schedule	Pipe Material	Process Connection	Insertion Length	Tube Length

STYLE NUMBER

- MT1 = Metal protection tube; no bushing
- MT2 = Metal protection tube; bushing connector

PIPE SIZE/INSTRUMENT CONNECTION

- 1 = 1/2" pipe (0.840" dia.) 1/2" NPT
- 2 = 3/4" pipe (1.050" dia.) 3/4" NPT
- 3 = 1" pipe (1.315" dia.) 1" NPT

PIPE SCHEDULE

- 40 = Schedule 40
- 80 = Schedule 80
- 160 = Schedule 160

PIPE MATERIAL

- 1 = 304 Stainless steel
- 3 = 316 Stainless steel
- 5 = Inconel® 600

PROCESS CONNECTION

- 1 = 1/2" NPT
- 2 = 3/4" NPT
- 3 = 1" NPT

INSERTION LENGTH

U# = (e.g., U6 = 6" below connector)

TUBE LENGTH

L# = (e.g., L6 = 6")

Inconel® is a registered trademark of Inco Alloys International

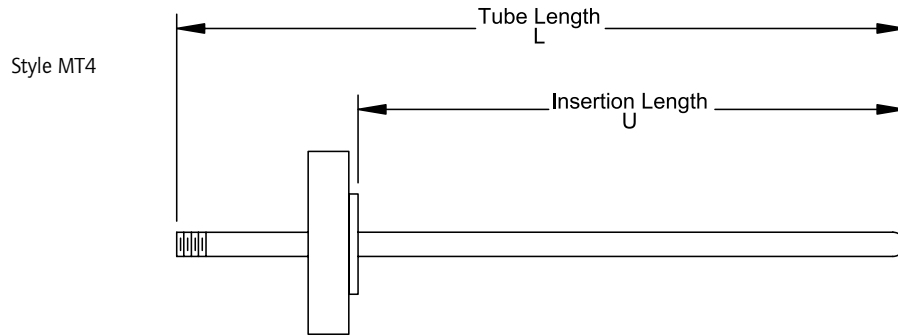


Accessories

Accessories

METAL PROTECTION TUBES

Tube with Flange - Style MT4



How to Build a Part Number

To order, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Style Number	Pipe Size	Pipe Schedule	Pipe /Flange Material	Flange Size	Flange Rating	Flange Type	Insertion Length	Tube Length

STYLE NUMBER

MT4 = Metal protection tube; flange connector

PIPE SIZE/INSTRUMENT CONNECTION

1 = 1/2" pipe (0.840" dia.) 1/2" NPT

2 = 3/4" pipe (1.050" dia.) 3/4" NPT

3 = 1" pipe (1.315" dia.) 1" NPT

PIPE SCHEDULE

40 = Schedule 40

80 = Schedule 80

160 = Schedule 160

PIPE MATERIAL

40 = Schedule 40

80 = Schedule 80

160 = Schedule 160

PIPE & FLANGE MATERIAL

1 = 304 Stainless steel

3 = 316 Stainless steel

FLANGE SIZE

1 = 1" Flange

1.5 = 1-1/2" Flange

2 = 2" Flange

3 = 3" Flange

4 = 4" Flange

FLANGE RATING

150 = 150# Flange

300 = 300# Flange

600 = 600# Flange

900/1500 = 900/1500# Flange

FLANGE TYPE

FF = Flat Face

RF = Raised Face

RTJ = Ring type joint

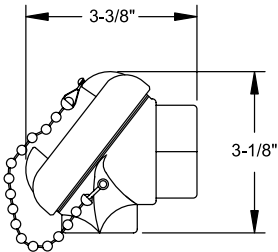
INSERTION LENGTH

U# = (e.g., U6 = 6" below connector)

TUBE LENGTH

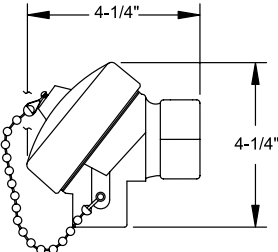
L# = (e.g., L6 = 6")

METAL CONNECTION HEADS



PH01 to PH06

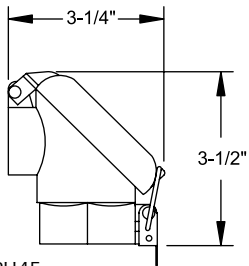
Option Code	Process Connection	Conduit Connection
Cast aluminum head; conforms to NEMA 4 requirements; four post ceramic terminal block; gasketed screw cover with stainless steel chain; maximum temperature 750°F (399°C)		
PH01	1/2" NPT	1/2" NPT
PH02	1/2" NPT	3/4" NPT
PH03	3/4" NPT	3/4" NPT



PH07 to PH12

Cast iron head; conforms to NEMA 4 requirements; four post ceramic terminal block; gasketed screw cover with stainless steel chain; maximum temperature 750°F (399°C)		
PH04	1/2" NPT	1/2" NPT
PH05	1/2" NPT	3/4" NPT
PH06	3/4" NPT	3/4" NPT

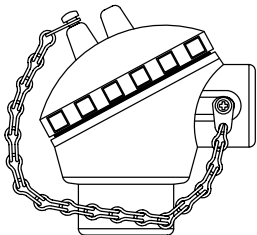
Cast aluminum heavy duty head; conforms to NEMA 4 requirements; four post ceramic terminal block; gasketed screw cover with stainless steel chain; maximum temperature 750°F (399°C)		
PH07	1/2" NPT	1/2" NPT
PH08	1/2" NPT	3/4" NPT
PH09	3/4" NPT	3/4" NPT



PH45

Cast iron heavy duty head; conforms to NEMA 4 requirements; four post ceramic terminal block; gasketed screw cover with stainless steel chain; maximum temperature 750°F (399°C)		
PH10	1/2" NPT	1/2" NPT
PH11	1/2" NPT	3/4" NPT
PH12	3/4" NPT	3/4" NPT

Hinged aluminum head; four post ceramic terminal block; flip top cover with latching closure; maximum temperature 600°F (315°C)		
PH45	1/2" NPT	3/4" NPT



PH46

Cast aluminum head; conforms to NEMA 4 requirements; for use with transmitter; silicone rubber O-ring, screw cover with stainless steel chain; maximum temperature 302°F (150°C)		
PH46	1/2" NPT	3/4" NPT

Add suffix "GRD" to part number for ground screw inside head on PH04 and PH12

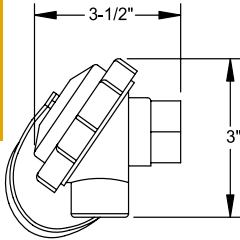
Note: For epoxy-coating, add suffix "E" to part number PH01 – PH12 (i.e., PH10E); maximum temperature 400°F (204°C)



Accessories

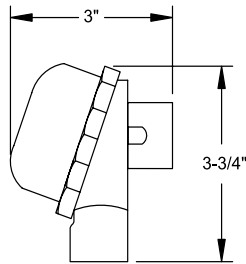
Accessories

NON-METAL CONNECTION HEADS



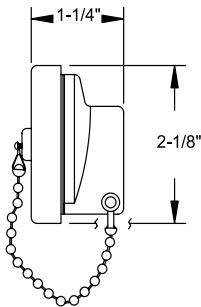
PH23 & PH24

Option Code	Process Connection	Conduit Connection	
Polypropylene head; conforms to NEMA 4 requirements; four post ceramic terminal block; gasketed screw cover with stainless steel chain; maximum temperature 220°F (104°C)			
PH23	1/2" NPT	3/4" NPT	Black head
PH24	1/2" NPT	3/4" NPT	White head



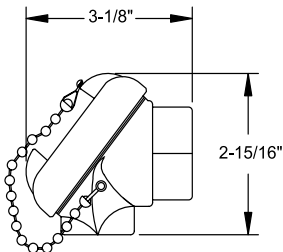
PH26

Nylon screw cover head; conforms to NEMA 4 requirements; four post ceramic terminal block; maximum temperature 250°F (121°C)			
PH26	1/2" NPT	1/2" NPT	



PH27 & PH28

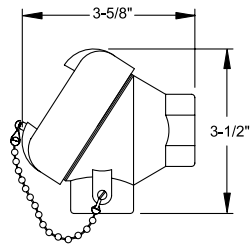
Miniature weatherproof plastic head; conforms to NEMA 4 requirements; molded in terminals; gasketed screw cover with stainless steel chain; maximum temperature 350°F (177°C)			
PH27	1/4" NPT	1/4" NPT	
PH28	3/8" NPT	1/4" NPT	



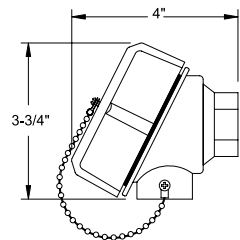
PH30

Delrin® head; conforms to NEMA 4 requirements; molded terminal block; gasketed screw cover with stainless steel chain; maximum temperature 250°F (121°C). For spring-loading, must specify PF 14 optional fitting.			
PH30	1/2" NPT	3/4" NPT	

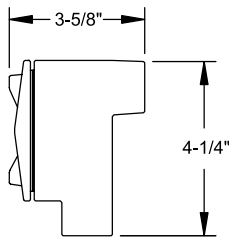
Delrin® is a registered trademark of E.I. DuPont de Nemours & Company.



PH47



PH50 to PH52



PH17 to PH22

Option Code	Process Connection	Conduit Connection
316 stainless steel head ; conforms to NEMA 4 requirements. Four post ceramic terminal block, silicone rubber o-ring; screw cover with stainless steel chain; maximum temperature 302°F (150°C)		
PH47	1/2" NPT	3/4" NPT

EXPLOSION PROOF HEADS

Cast aluminum explosion proof head; three post ceramic terminal block; screw cover with chain and gasketed o-ring (100°C); Class I Div. 1, Groups B, c and D; Class II, Groups E, F and G; CSA/FM approved

PH50	1/2" NPT	1/2" NPT
PH51	1/2" NPT	3/4" NPT
PH52	3/4" NPT	3/4" NPT

Cast aluminum explosion proof head; four post plastic terminal strip; screw cover; maximum temperature 350°F (186°C); UL listed and CSA approved; Class I, Groups C and D; Class II, Groups E, F and G

PH17	1/2" NPT	1/2" NPT
PH18	1/2" NPT	3/4" NPT
PH19	3/4" NPT	3/4" NPT

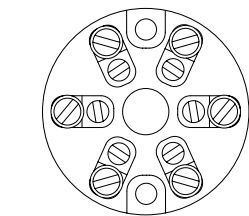
Cast iron explosion proof head, galvanized and coated; four post plastic terminal strip; screw cover; maximum temperature 350°F (186°C); UL listed and CSA approved; Class I, Groups C and D; Class II, Groups E, F and G

PH20	1/2" NPT	1/2" NPT
PH21	1/2" NPT	3/4" NPT
PH22	3/4" NPT	3/4" NPT

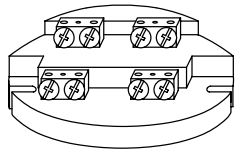
Add suffix "G" to part number for gasketed O-ring; maximum temperature 240°F (115°C)
 Add suffix "C" to part number for stainless steel cover chain
 Add suffix "E" to part number for epoxy coating; maximum temperature 400°F (204°C)

TERMINAL BLOCKS

Option Code	Description
	Ceramic terminal block; brass terminals; maximum temperature 1000°F (538°C)
PH39	Single element; 2 wire termination - 8 AWG max. conductor size
PH40	Single element; 3 wire termination - 8 AWG max. conductor size
PH41	Dual element; 4 wire termination - 8 AWG max. conductor size
PH42	Triplex element; 6 wire termination- 14 AWG max. conductor size
PH44	Four post terminal block
PH48	Three post Ceramic Terminal Block
PH49	Six post Ceramic Terminal Block

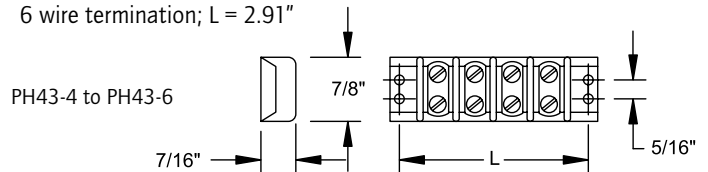


PH48 to PH49



PH39 to PH44

Plastic terminal strip; maximum temperature 221°F (105°C)
 PH43-4 4 wire termination; L = 2.16"
 PH43-6 6 wire termination; L = 2.91"





Accessories

Accessories

THERMOCOUPLE WIRE

Selection and use of Thermocouple and Thermocouple Extension Wire

Thermocouple grade wire can be fabricated into accurate and dependable thermocouples by joining the thermoelements together at the sensing end. Thermocouple wire or thermocouple extension wire must be used to extend thermocouples to the indication or control instrumentation. The conditions of measurement determine the type of thermocouple wire and insulation to be used. Temperature range, wire gauge, environment, protection, insulation requirements, response and service life should be considered.

Insulation Characteristics

Description Individual/Overall	Temperature Limit Continuous Use		Moisture Resistance	Abrasion Resistance
	°C	°F		
Teflon®/Teflon® FEP	204	400	Excellent	Excellent
Teflon®/Teflon® TFE or PFA Tape	260	500	Excellent	Excellent
Fiberglass/Fiberglass	482	900	Fair	Fair
Fiberglass (Filaflex®) /Fiberglass (Filaflex®) High Temp	760	1400	Fair	Fair

Thermocouple Extension Wire: Thermocouple extension wire has approximately the same thermoelectric characteristics as thermocouple wire but its purpose is to carry the signal only, not to measure temperature. Thermocouple extension wire can offer advantages in cost when used for connections between thermocouples and instruments.

Thermocouple and Extension Wire – Teflon® Insulated

- Calibrated Conductors
- 400°F (204°C) FEP Teflon® insulation
- 400°F (204°C) FEP Teflon® jacket

Part Number	Description	Part Number	Description	Part Number	Description
	20 Gauge Solid Thermocouple Wire		20 Gauge Stranded Thermocouple Wire		20 Gauge Stranded Extension Wire
20JS58	Type J	20JST58	Type J	20JXST58	Type JX
20KS58	Type K	20KST58	Type K	20KXST58	Type KX
20TS58	Type T	20TST58	Type T	20TXST58	Type TX
20ES58	Type E	20EST58	Type E	20EXST58	Type EX

- Calibrated Conductors
- 500°F (260°C) TFE Teflon® tape insulation
- 500°F (260°C) TFE Teflon® tape jacket

Part Number	Description	Part Number	Description	Part Number	Description
	20 Gauge Solid Thermocouple Wire		20 Gauge Stranded Thermocouple Wire		20 Gauge Stranded Extension Wire
20JS60	Type J	20JST60	Type J	20JXST60	Type JX
20KS60	Type K	20KST60	Type K	20KXST60	Type KX
20TS60	Type T	20TST60	Type T	20TXST60	Type TX
20ES60	Type E	20EST60	Type E	20EXST60	Type EX

Thermocouple and Extension Wire – Fiberglass Insulated

- Calibrated Conductors
- 900°F (482°C) braided fiberglass insulation
- 900°F (482°C) braided fiberglass jacket

Part Number	Description	Part Number	Description	Part Number	Description
20 Gauge Solid Thermocouple Wire		20 Gauge Stranded Thermocouple Wire		20 Gauge Stranded Extension Wire	
20JS57	Type J	20JST57	Type J	20JXST57	Type JX
20KS57	Type K	20KST57	Type K	20KXST57	Type KX
20TS57	Type T	20TST57	Type T	20TXST57	Type TX
20ES57	Type E	20EST57	Type E	20EXST57	Type EX

- Calibrated Conductors
- 1,400°F (760°C) braided fiberglass (Filaflex®) insulation
- 1,400°F (760°C) braided fiberglass (Filaflex®) jacket

Part Number	Description	Part Number	Description	Part Number	Description
20 Gauge Solid Thermocouple Wire		20 Gauge Stranded Thermocouple Wire		20 Gauge Stranded Extension Wire	
20JS70	Type J	20JST70	Type J	20JXST70	Type JX
20KS70	Type K	20KST70	Type K	20KXST70	Type KX
20TS70	Type T	20TST70	Type T	20TXST70	Type TX
20ES70	Type E	20EST70	Type E	20EXST70	Type EX

- Calibrated Conductors with Stainless steel overbraid
- 1,400°F (760°C) braided fiberglass (Filaflex®) insulation
- 1,400°F (760°C) braided fiberglass (Filaflex®) jacket

Part Number	Description	Part Number	Description	Part Number	Description
20 Gauge Solid Thermocouple Wire		20 Gauge Stranded Thermocouple Wire		20 Gauge Stranded Extension Wire	
20JS71	Type J	20JST71	Type J	20JXST71	Type JX
20KS71	Type K	20KST71	Type K	20KXST71	Type KX
20TS71	Type T	20TST71	Type T	20TXST71	Type TX
20ES71	Type E	20EST71	Type E	20EXST71	Type EX

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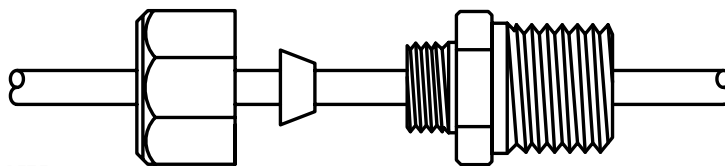
Filaflex® is a registered trademark of PMC Corporation.



Accessories

Accessories

Compression Fittings				
Option Code	Sensor Diameter	NPT	Material	Ferrule
PF38	1/8"OD	1/8"	Stainless steel	Stainless steel
PF39	1/8"OD	1/8"	Stainless steel	Teflon®
PF40	1/8"OD	1/4"	Stainless steel	Stainless steel
PF41	1/8"OD	1/4"	Stainless steel	Teflon®
PF44	5/32"OD	1/8"	Stainless steel	Teflon®
PF45	5/32"OD	1/8"	Stainless steel	Brass
PF46	5/32"OD	1/4"	Stainless steel	Stainless steel
PF47	5/32"OD	1/4"	Stainless steel	Teflon®
PF52	3/16"OD	1/8"	Stainless steel	Stainless steel
PF53	3/16"OD	1/8"	Stainless steel	Teflon®
PF54	3/16"OD	1/8"	Brass	Brass
PF55	3/16"OD	1/4"	Stainless steel	Stainless steel
PF56	3/16"OD	1/4"	Stainless steel	Teflon®
PF59	3/16"OD	1/2"	Stainless steel	Stainless steel
PF60	3/16"OD	1/2"	Stainless steel	Teflon®
PF63	1/4"OD	1/8"	Stainless steel	Stainless steel
PF65	1/4"OD	1/4"	Stainless steel	Stainless steel
PF66	1/4"OD	1/4"	Stainless steel	Teflon®
PF67	1/4"OD	1/4"	Teflon®	Teflon®
PF68	1/4"OD	1/4"	Brass	Brass
PF73	1/4"OD	1/2"	Stainless steel	Stainless steel
PF74	1/4"OD	1/2"	Stainless steel	Teflon®
PF75	1/4"OD	1/2"	Brass	Brass



PF38 to PF75

INTERCHANGEABILITY

SENSOR	TEMPERATURE RANGE IN °C	OUTPUT TOLERANCE STANDARD GRADE (whichever is greater)	PREMIUM GRADE (whichever is greater)
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THERMOCOUPLES

Type J	Iron/Constantan	0 to 750	±2.2 °C or ±0.75%	±1.1 °C or ±0.4%
Type T	Copper/Constantan	0 to 350	±1 °C or ±0.75%	±0.5 °C or ±0.4%
Type K	Chromel™/Alumel™	0 to 1250	±2.2 °C or ±0.75%	±1.1 °C or ±0.4%
Type E	Chromel™/Constantan	0 to 900	±1.7 °C or ±0.5%	±1 °C or ±0.4%

RESISTANCE TEMPERATURE DETECTORS

Platinum	-200 to 850	±0.12% @ 0°C
Nickel-Iron	-100 to 232	±0.5% @ 0°C
Copper	-100 to 260	±0.2% @ 25°C

THERMISTORS

Designation TH1	-45 to 260	±5%
Designation TH2	-45 to 260	±2%
Designation TH3	-45 to 150	±0.2 °C from 0 to 70°C
Designation TH4	-45 to 260	±5%
Designation TH5	-45 to 150	±0.2 °C from 0 to 70°C
Designation TH7	-45 to 150	±5%

PERMISSIBLE DEVIATION FROM BASIC VALUES

Platinum RTDs

°C	CLASS B (Standard)		CLASS A	
	Ohms	Corresp. °C	Ohms	Corresp. °C
-200	±0.56	±1.30	±0.24	±0.55
-100	±0.32	±0.80	±0.14	±0.35
0	±0.12	±0.30	±0.06	±0.15
100	±0.30	±0.80	±0.13	±0.35
200	±0.48	±1.30	±0.20	±0.55
300	±0.64	±1.80	±0.27	±0.75
400	±0.79	±2.30	±0.33	±0.95
500	±0.93	±2.80	±0.38	±1.15
600	±1.06	±3.30	±0.43	±1.35
700	±1.17	±3.80	-	-
800	±1.28	±4.30	-	-
850	±1.34	±4.60	-	-

Our standard wire gauge is 20 AWG for thermocouples and 22 AWG for RTDs and thermistors. The standard leadwire length tolerances available are (unless otherwise noted):

Length (inches)	Tolerance (inches)
0 to 6,999	±0.25
7 to 12,999	±0.50
13 to 36,999	±1
37 to 72,999	±2
73 and above	±4



Technical

Technical

TEMPERATURE CONVERSION CHART

To °F	From	To °C	To °F	From	To °C	To °F	From	To °C
	-330	-201	158	70	21	878	470	243
	-320	-196	176	80	27	896	480	249
	-310	-190	194	90	32	914	490	254
	-300	-184	212	100	38	932	500	260
	-290	-179	230	110	43	950	510	266
	-280	-173	248	120	49	968	520	271
-454	-270	-168	266	130	54	986	530	277
-436	-260	-162	284	140	60	1,004	540	282
-418	-250	-157	302	150	66	1,022	550	288
-400	-240	-151	320	160	71	1,040	560	293
-382	-230	-146	338	170	77	1,058	570	299
-364	-220	-140	356	180	82	1,076	580	304
-346	-210	-134	374	190	88	1,094	590	310
-328	-200	-129	392	200	93	1,112	600	316
-310	-190	-123	410	210	99	1,130	610	321
-292	-180	-118	428	220	104	1,148	620	327
-274	-170	-112	446	230	110	1,166	630	332
-256	-160	-107	464	240	116	1,184	640	338
-238	-150	-101	482	250	121	1,202	650	343
-220	-140	-96	500	260	127	1,220	660	349
-202	-130	-90	518	270	132	1,238	670	354
-184	-120	-84	536	280	138	1,256	680	360
-166	-110	-79	554	290	143	1,274	690	366
-148	-100	-73	572	300	149	1,292	700	371
-130	-90	-68	590	310	154	1,310	710	377
-112	-80	-62	608	320	160	1,328	720	382
-94	-70	-57	626	330	166	1,346	730	388
-76	-60	-51	644	340	171	1,364	740	393
-58	-50	-46	662	350	177	1,382	750	399
-40	-40	-40	680	360	182	1,400	760	404
-22	-30	-34	698	370	188	1,418	770	410
-4	-20	-29	716	380	193	1,436	780	416
14	-10	-23	734	390	199	1,454	790	421
32	0	-18	752	400	204	1,472	800	427
50	10	-12	770	410	210	1,490	810	432
68	20	-7	788	420	216	1,508	820	438
86	30	-1	806	430	221	1,526	830	443
104	40	4	824	440	227	1,544	840	449
122	50	10	842	450	232	1,562	850	454
140	60	16	860	460	238	1,580	860	460

TEMPERATURE CONVERSION CHART

To °F	From	To °C	To °F	From	To °C	To °F	From	To °C
1,598	870	466	2,462	1,350	732	3,326	1,830	999
1,616	880	471	2,480	1,360	738	3,344	1,840	1,004
1,634	890	477	2,498	1,370	743	3,362	1,850	1,010
1,652	900	482	2,516	1,380	749	3,380	1,860	1,016
1,670	910	488	2,534	1,390	754	3,398	1,870	1,021
1,688	920	493	2,552	1,400	760	3,416	1,880	1,027
1,706	930	499	2,570	1,410	766	3,434	1,890	1,032
1,724	940	504	2,588	1,420	771	3,452	1,900	1,038
1,742	950	510	2,606	1,430	777	1,202	1,910	343
1,760	960	516	2,624	1,440	782	3,488	1,920	1,049
1,778	970	521	2,642	1,450	788	3,506	1,930	1,054
1,796	980	527	2,660	1,460	793	3,524	1,940	1,060
1,814	990	532	2,678	1,470	799	3,542	1,950	1,066
1,832	1,000	538	2,696	1,480	804	3,560	1,960	1,071
1,850	1,010	543	2,714	1,490	810	3,578	1,970	1,077
1,868	1,020	549	2,732	1,500	816	3,596	1,980	1,082
1,886	1,030	554	2,750	1,510	821	3,614	1,990	1,088
1,904	1,040	560	2,768	1,520	827	3,632	2,000	1,093
1,922	1,050	566	2,786	1,530	832	3,650	2,010	1,099
1,940	1,060	571	2,804	1,540	838	3,668	2,020	1,104
1,958	1,070	577	2,822	1,550	843	3,686	2,030	1,110
1,976	1,080	582	2,840	1,560	849	3,704	2,040	1,116
1,994	1,090	588	2,858	1,570	854	3,722	2,050	1,121
2,012	1,100	593	2,876	1,580	860	3,740	2,060	1,127
2,030	1,110	599	2,894	1,590	866	3,758	2,070	1,132
2,048	1,120	604	2,912	1,600	871	3,776	2,080	1,138
2,066	1,130	610	2,930	1,610	877	3,794	2,090	1,143
2,084	1,140	616	2,948	1,620	882	3,812	2,100	1,149
2,102	1,150	621	2,966	1,630	888	3,830	2,110	1,154
2,120	1,160	627	2,984	1,640	893	3,848	2,120	1,160
2,138	1,170	632	3,002	1,650	899	3,866	2,130	1,166
2,156	1,180	638	3,020	1,660	904	3,884	2,140	1,171
2,174	1,190	643	3,038	1,670	910	3,902	2,150	1,177
2,192	1,200	649	3,056	1,680	916	3,920	2,160	1,182
2,210	1,210	654	3,074	1,690	921	3,938	2,170	1,188
2,228	1,220	660	3,092	1,700	927	3,956	2,180	1,193
2,246	1,230	666	3,110	1,710	932	3,974	2,190	1,199
2,264	1,240	671	3,128	1,720	938	3,992	2,200	1,204
2,282	1,250	677	3,146	1,730	943	4,010	2,210	1,210
2,300	1,260	682	3,164	1,740	949	4,028	2,220	1,216
2,318	1,270	688	3,182	1,750	954	4,046	2,230	1,221
2,336	1,280	693	3,200	1,760	960	4,064	2,240	1,227
2,354	1,290	699	3,218	1,770	966	4,082	2,250	1,232
2,372	1,300	704	3,236	1,780	971	4,100	2,260	1,238
2,390	1,310	710	3,254	1,790	977	4,118	2,270	1,243
2,408	1,320	716	3,272	1,800	982	4,136	2,280	1,249
2,426	1,330	721	3,290	1,810	988	4,154	2,290	1,254
2,444	1,340	727	3,308	1,820	993	4,172	2,300	1,260



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Glossary of Terms

Glossary of Terms

Absolute zero: Temperature at which thermal energy is at a minimum. Defined as 0 Kelvin, calculated to -273.15°C or -459.67°F .

Accuracy: Closeness of a reading or indication of a measurement device to the actual value of the quantity being measured.

Alpha (α): The average percent change in resistance per degree of a pure metal resistance device between 0 and 100°C . Usually designated by the Greek letter alpha, α , with units of $\Omega/\Omega/^{\circ}\text{C}$. The common alpha for a platinum RTD is $0.00385 \Omega/\Omega/^{\circ}\text{C}$.

ance device between 0 and 100°C . Usually designated by the Greek letter alpha, α , with units of $\Omega/\Omega/^{\circ}\text{C}$. The common alpha for a platinum RTD is $0.00385 \Omega/\Omega/^{\circ}\text{C}$.

Alumel*: An aluminum-nickel alloy used as the negative leg of Type K thermocouples.

ASME: American Society of Mechanical Engineers formulates rules for the construction of steam boilers and other pressure vessels. Also provides material specifications covering contents, performance, packaging, etc. of materials. Many ASME specifications covering materials are identical to ASTM specifications.

ASTM: American Society for Testing Materials—a scientific and technical organization formed for the development of standards on characteristics and performance of materials, products, systems and services and the promotion of related knowledge.

AWG: American Wire Gauge.

Breakdown Voltage: The voltage at which the insulation between two conductors breaks down.

BTU: British Thermal Unit. The quantity of thermal energy required to raise one pound of water 1°F at or near its maximum density (39.1°F).

Calibration: The process of adjusting an instrument or compiling a deviation chart so that its reading can be correlated to the actual value being measured.

Ceramic insulation: High-temperature compositions of metal oxides used to insulate a pair of thermocouple wires. The most common are Alumina (Al_2O_3), Beryllia (BeO), and Magnesia (MgO). Their application depends upon temperature and type of thermocouple. High-purity Alumina is required for platinum alloy thermocouples. Ceramic insulators are available as single and multihole tubes or as beads.

Connection head: An enclosure attached to the end of a thermocouple which can be cast iron, aluminum or plastic within which the electrical connections are made.

Constantan: A copper-nickel alloy used as the negative lead in Type E, Type J, and Type T thermocouples.

Chromel*: A chromium-nickel alloy used as the positive leg in Type K and Type E thermocouples.

DIN: Deutsches Institut für Normung. A German agency that sets engineering and

dimensional standards that has worldwide recognition.

Dual element sensor: A sensor assembly with two independent sensing elements.

Emf: Electromotive force. A rise in (electrical) potential energy. The principal unit is the volt.

Error: The difference between the correct or desired value and the actual reading or value taken.

Exposed junction: A form of construction of a thermocouple probe where the hot or measuring junction protrudes beyond the sheath material so as to be fully exposed to the medium being measured. This form of construction usually gives the fastest response time.

Ferrule: A compressible tubular fitting that is compressed onto a probe inside a compression fitting to form a gas-tight seal.

FM: Factory Mutual Research Corp. An organization which sets industrial safety standards.

Grounded junction: A form of construction of a thermocouple probe where the hot or measuring junction is in electrical contact with the sheath material so that the sheath and thermocouple will have the same electrical potential.

IR: Insulation Resistance—The opposition offered by the insulation material of a wire to the passage of a steady electric current—measured from conductor to conductor or conductor to sheath.

Ice point: The temperature at which pure water freezes, 0°C , 32°F , 273.15K .

Immersion length: That portion of the sensor that will or could be subjected to the temperature being measured (exception: bayonet thermocouples where the immersion is measured below the cap).

Impedance: The total opposition to electrical flow (resistive plus reactive).

Insulated junction: See ungrounded junction.

Interchangeability error: A measurement error that can occur if two or more probes are used to make the same measurement. It is caused by a slight variation in characteristics of different probes.

Intrinsically safe: An instrument which will not produce any spark or thermal effects under normal or abnormal conditions that will ignite a specified gas mixture.

ITS-90: International Temperature Scale of 1990.

Junction: The point in a thermocouple where the two dissimilar metals are joined.

Lag: That portion of a well above the threads and below the hex, intended to extend through the lagging of a vessel.

Limits of error: A tolerance band for the thermal electric response of thermocouple wire expressed in degrees or percentage defined by ANSI specification MC-96.1.

Linearity: A deviation of an instrument's response from a straight line.

Loop resistance: The total resistance of a thermocouple circuit caused by the resistance of the thermocouple wire.

Magnesium oxide: (MgO) A ceramic insulation medium that provides high resistivity, excellent purity and high temperature.

Mineral-insulated cable: A type of thermocouple cable which has an outer metal sheath and mineral (usually magnesium oxide) insulation inside, separating thermocouple wires from each other and from the outer sheath. This cable is usually drawn down to compact the mineral insulation and is available in diameters from .010 to .375 inches. It is ideally suited for high-temperature and severe-duty applications.

NIST: (Formally N.B.S.) National Institute of Standards and Technology. Provides traceability to true temperature. NIST traceability is necessary to insure the compliance of thermocouples and RTDs to the standards which NIST has established relative to accuracy.

NPT: National Pipe Thread, Tapered.

O.D.: Outside diameter.

Pipe well: Protection tube made from pipe and designed to accept a thermocouple element, where pressure is not a primary concern.

Protection tube: A metal or ceramic tube, closed at one end, into which a temperature sensor is inserted. The tube protects the sensor from the medium into which it is inserted.

Reference junction: The cold junction in a thermocouple circuit which is held at a stable known temperature. The standard reference temperature is 0°C (32°F); however, other temperatures can be used.

Response time (Time Constant): The time required by a sensor to reach 63.2% of a step change in temperature under a specified set of conditions. Five time constants are required for the sensor to stabilize at 100% of the step change value.

RTD: Resistance temperature detector.

SAMA: Scientific Apparatus Makers Association. An association that has issued standards covering platinum, nickel, and copper resistance elements (RTDs).

Seebeck effect: When a circuit is formed by a junction of two dissimilar metals and the junctions are held at different temperatures, a current will flow in the circuit caused by the difference in temperature between the two junctions.

Secondary junction: Junction that develops between the measuring and reference junction as a result of a short or third metal—can contribute an error or replace the primary (measuring) junction and the sensor would indicate the temperature at the secondary junction.

Sensitivity: The minimum change in input signal to which an instrument can respond.

Sheath length: The total length of the element, regardless of immersion limitations as a result of fittings.

Temperature coefficient: See "Alpha".

Test well: A thermowell used intermittently for checking temperature with an RTD, thermocouple or dial thermometer, usually supplied with plug and chain to protect threads and exclude foreign matter when not in use.

Thermal conductivity: The property of a material to conduct heat in the form of thermal energy.

Thermal expansion: An increase in size due to an increase in temperature expressed in units of an increase in length or increase in size per degree i.e., inches/inch/degree C.

Thermistor: A temperature-sensing element composed of sintered semiconductor material which exhibits a large change in resistance proportional to a small change in temperature. Thermistors usually have negative temperature coefficients.

Thermocouple: The junction of two dissimilar metals which has a voltage output proportional to the difference in temperature between the hot junction and the lead wires (cold junction). Standard thermocouple types are:

Type (ANSI Symbol)	Thermocouple Material
J	Iron/Constantan
K	Chromel/Alumel
T	Copper/Constantan
E	Chromel/Constantan
R	Platinum/Platinum 13% Rhodium
S	Platinum/Platinum 10% Rhodium
B	Platinum 6% Rhodium/Platinum 30% Rhodium

Thermowell: A closed-end tube designed to protect temperature sensors from harsh environments, high pressure, and flows. They can be installed into a system by pipe thread or welded flange and are usually made of corrosion-resistant metal or ceramic material depending upon the application.

Transmitter (two-wire): A device which is used to transmit temperature data from either a thermocouple or RTD via a two-wire current loop. The loop has an external power supply and the transmitter acts as a variable resistor with respect to its input signal.

UL: Underwriters Laboratories, Inc. An independent laboratory that establishes standards for commercial and industrial products.

Ungrounded junction: A form of construction of a thermocouple probe where the hot or measuring junction is fully enclosed by and insulated from the sheath material.

Union: A form of pipe fitting where two extension pipes are joined at a separable coupling.

*Trade name of Hoskins Mfg. Co.

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RECOMMENDED PRACTICES AND WARNINGS

Applied Sensor Technologies recommends careful consideration of the following factors when specifying and installing AST temperature sensors. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, maximum temperature limits stated in literature and on drawings must never be exceeded, even by surges in the system. Operation of the unit up to maximum temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated range. Excessive cycling at maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- Install unit where shock, vibration, electrical noise and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift or instability. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Wire unit according to local and national electrical codes, using appropriate wire size recommended.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 18 months. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

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