Temperature Sensors

STANDARD TEMPERATURE SENSORS

UNITED ELECTRIC CONTROLS

Temperature Sensors

OVERVIEW

At United Electric Controls we manufacture a broad range of temperature sensors. We design, engineer and manufacture:

- **Thermocouples**
- **RTDs (both wire wound and thin film)**
- **Thermistors**
- **Integrated Circuit temperature sensors**
- **We also have available Temperature Sensor Accessories**

All of our products are known for their consistent high reliability and durability. We are continually examining and improving our engineering, production and service operations to meet constantly evolving customer requirements. Our ISO 9001 certification is objective proof of our company-wide commitment to quality.

UE Temperature Sensor Group

UE has recognized the importance of Temperature Sensors to the future of United Electric Controls. We have assembled a talented group of Temperature Sensor experts to form our Sensor Group at our Headquarters in Watertown, MA. This organization is specifically formed to serve our wide spectrum of customers. We have experienced professionals dedicated to producing the best temperature sensors for your products. This group consists of experts with extensive Temperature Sensor experience in:

- **Sales**
- **Engineering**
- **Design**
- **Supplier Development**
- **Manufacturing/Manufacturing Engineering**
- **Customer Service**
- **Marketing**
- **Quality Assurance**

APPLICATIONS

UE Temperature Sensor Customers

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

OEM Sensors

United Electric Controls excels in supplying today's exacting manufacturers with temperature sensors that meet their needs. We can help you develop, and then manufacture the sensor that works with your product. UE brings many strengths to the OEM customer. Some of them are:

- UE has Sales personnel located around the world so they can be available to serve customers whenever and wherever they need assistance.
- We have the Engineering expertise to work with your engineers to develop the right design.
- Our highly efficient manufacturing processes are designed to build your sensor economically and reliably.

- Quick Response to Orders - UE can deliver your parts when you need them.

We manufacture temperature sensors for many different types of customers' applications. Our sensors are included in many scientific instruments. They are used to make certain that the food you eat is properly cooked or stored. UE temperature sensors are used in medical equipment where reliability is the primary concern. Jet fighters use UE sensors to make certain that their engines are operating at peak efficiency.

Standard Catalog Products

United Electric Controls has a broad selection of Standard Catalog Temperature Sensors that are designed for general industrial use. These are available for a variety of uses and come in many standard configurations.

United Electric Controls has General Purpose and Mineral Insulated thermocouples, wound and thin film RTDs and thermistors for all standard applications. In our catalog we offer a wide variety of styles of temperature sensors using these different sensing elements. Our sensors come as a:

- Stainless steel sheath with leadwires
- Stainless steel sheath with plugs
- Stainless steel sheath with armored leadwires
- Stainless steel sheath with NEMA 4, NEMA 4X connection heads
- Stainless steel sheath with explosion proof heads
- Stainless steel sheath with process mounting hardware
- Stainless steel sheath with handles
- Stainless steel sheath with attachment lugs, washers or pads

In addition, United Electric Controls offers a wide selection of accessories like thermowells and extension wire.

Our Standard Catalog Temperature Sensors are used in a wide variety of industrial applications. They are used in turbines in electric power plants, 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

Which Sensor Should I Use?

When choosing which temperature sensor to use there are many things to consider. One very important decision is selecting the type of sensor that best fits your requirement. Below is a description of the types of Temperature Sensors that United Electric Controls designs, engineers and manufactures. Each technology has advantages and limitations.

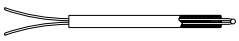
Thermocouples

A thermocouple is basically two strips of wires of different metals. These metal wires are joined at one end and the voltage is measured at the other end. Changes in the temperature at the juncture induce a change in electromotive force (EMF) at the other end. As the temperature goes up, this output EMF of the thermocouple rises, though not necessarily linearly.

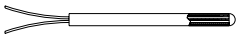
TECHNOLOGY

There are three common configurations for the sheathed thermocouple: exposed, grounded, and ungrounded.

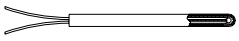
E=Exposed



G=Grounded



U=Ungrounded



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

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.

U = Ungrounded junction is electrically isolated from the sheath material by magnesium oxide insulation.

Thermocouples generally can measure temperatures over wide ranges, inexpensively. They are very rugged, but they are not as accurate as RTD's and thermistors.

Here is a summary of some of the advantages and disadvantages of thermocouples:

Thermocouple Types

There are many different types of thermocouples. They are made of different types of wire and have very different properties, making one type better for a specific application than another. Below are descriptions of the types of thermocouples that United Electric Controls Co. makes.

Type J – The Iron - Constantan "J" curve thermocouple is the most widely used thermocouple; it is versatile and has a relatively low cost. It has a positive iron wire and a negative Constantan wire and is recommended for reducing atmospheres. The operating range for this alloy combination is from 0° to 750°C (32° to 1380° F) for the largest wire sizes. Smaller size wire should operate in correspondingly lower temperatures.

Type T – The Copper - Constantan "T" curve thermocouple, with a positive copper wire and a negative Constantan wire, is 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 work since the homogeneity of the component wires can be maintained better than with other base metal wires. Therefore, errors due to inhomogeneity of wires in zones of temperature gradients are greatly reduced.

Type K – The Chromel ™ - Alumel ™ "K" curve thermocouple is often used at high temperatures. It has a positive Chromel™ wire and a negative Alumel ™ wire and 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. Smaller size wire should operate in correspondingly lower temperatures.

Advantages	Disadvantages
Self Powered	Non Linear
Simple	Low Voltage
Rugged	Reference Required
Inexpensive	Least Stable
Wide Variety	Least Sensitive
Wide Temperature Range	

Type E – The Chromel ™ - Constantan "E" curve thermocouple has the highest EMF of all standard thermocouples. It has a positive Chromel ™ wire and a negative Constantan wire and 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).

Thermocouple Insulation Types

United Electric Controls Thermocouples are available in three versions:

GP - General-Purpose thermocouples that 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, a Mineral Insulation can be added in the tube. For UE MI thermocouples compressed magnesium oxide is added inside the tube. These are used to measure temperatures of 260° C (500° F) or higher.

BTC - Beaded thermocouples are mainly used in furnace applications.

Wire wound RTD

Thin film RTD

RTD

RTD's are stable and have a fairly wide temperature range, but are not as rugged and inexpensive as thermocouples. Since they require the use of electric current to make measurements, RTD's are subject to inaccuracies from self-heating.

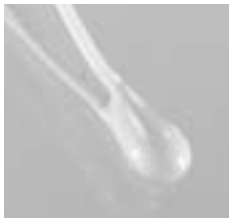
A RTD capitalizes on the fact that the electrical resistance of a material changes as its temperature changes. RTD's rely on the resistance change in a metal, with the resistance rising more or less linearly with temperature. Traditionally, RTD's use a length of conductor (platinum, nickel iron or copper)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

RTD's are used to measure temperatures from -196° to 788° C (-320° to 1450° F).

Here is a summary of some of the advantages and disadvantages of RTD's:

Advantages	Disadvantages
Most Stable	Expensive
Most Accurate	Current Source Required
More Linear than Thermocouple	Small delta R
	Low Absolute resistance
	Self-heating
	Less rugged than thermocouples

TECHNOLOGY



Thermistors

Thermistors tend to be more accurate than RTD's and thermocouples, but they have a much more limited temperature range because of their marked non-linearity.

A Thermistor capitalizes on the fact that the electrical resistance of a material changes as its temperature changes. Thermistors rely on the resistance change in a ceramic semiconductor, with the resistance dropping non-linearly with a temperature rise.

Thermistors can be a low-cost solution to temperature measurement. They tend to have large signal outputs and their small size permits fast response to temperature changes. UE Thermistors are used to measure temperatures from -45° to 260° C (-49° to 500° F).

Here is a summary of some of the advantages and disadvantages of thermistors:

Advantages	Disadvantages
High Output Fast Response Two-wire Measurement	Non-Linear Limited Temperature Range Fragile Current Source Required Self-heating

IC Sensor

The newest type of temperature sensor on the market is the integrated circuit (IC) temperature transducer. IC sensors can be designed to give either voltage or current output and are 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 (-49° to 300° F).

Advantages	Disadvantages
Most Linear Highest Output Inexpensive	Limited to 150° C Power Supply Required Slow Self-heating Limited Configurations

Temperature Sensor Styles

Temperature Sensors at UE are built in a broad spectrum of styles. They are:

Leadwire – Standard thermocouples with fiberglass, Teflon® or PVC insulation available with a variety of protective coverings including Teflon® sleeves

Terminal Heads – Configurations including NEMA 4 and explosion proof heads; with or without NUN (nut-nipple-nut) connections

Process Mount – Double and single sided process mount styles and single sided instrument mounts

Plugs – Standard and mini male plugs with and without leadwires

Surface Mount – A variety of mounting options including washer styles, mounting lugs and weld pads; with fiberglass or Teflon® insulation

TEMPERATURE SENSOR SHEATH MATERIALS

Sheath Material	Description	Applications	Temperature Range
304 Stainless Steel **UE Non Standard Material**	A very good all purpose stainless steel of moderate cost.	Food, Beverage and Dairy Chemical Processing Hospital Equipment Pharmaceutical Nuclear Equipment Mild Corrosives	Up to 875° C (1,600° F) for cyclical applications
316 Stainless Steel **UE Standard Material**	The best corrosion resistance of the Stainless Steels. Good resistance to sulfur or chlorine bearing liquids.	Marine Chemical Processing Food Petroleum Refining Pharmaceutical Pulp and Paper Textile Finishing	Up to 875° C (1,600° F)
Inconel® 600 **UE Non Standard Material**	This alloy is more expensive than st/st but has higher corrosion resistance and better temperature tolerance.	Furnace Chemical Processing Food Processing Nuclear Power Equipment Caustic Chemicals	Up to 1,175° C (2,150° F)

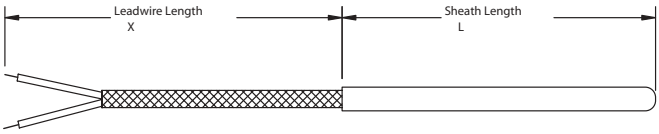
HOW TO ORDER

Each page in this publication that describes a temperature sensor has a section that outlines the information necessary to order that part. This section has a series of boxes that need to be filled with the correct numbers and letters to make sure that the proper part had been ordered. The information varies from sensor style to sensor style, so it is important to review your selections. All the standard options available are described in the section following the "How to build a Part Number" section.

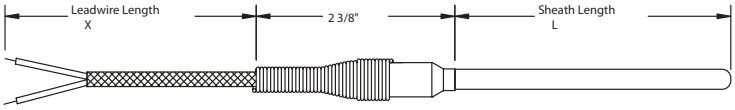
THERMOCOUPLE SHEATH WITH LEADWIRE

Styles 2, 4, 5,7, 28 and 69

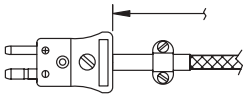
General Purpose (GP)
Style 02, 04 & 28



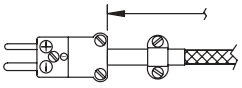
Mineral Insulated (MI)
Style 02, 04 & 28



Standard Plug
Style 05 & 07



Miniature Plug
Style 69



How to build a part number

To order a United Electric Controls 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 a non-standard 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)

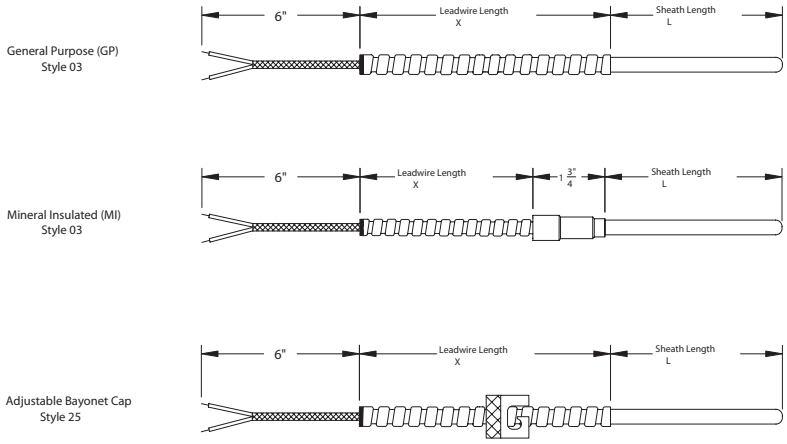
LEADWIRE LENGTH

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

Temperature Sensors

THERMOCOUPLE SHEATH WITH LEADWIRE AND ARMOR

Styles 03 and 25



How to build a part number

To order a United Electric Controls 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)

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 a non-standard option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction

U – Ungrounded Junction

SHEATH LENGTH

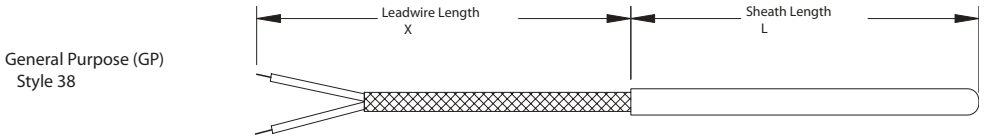
L# - (e. g., **L6** = 6 inch sheath, **L12.5** = 12.5 inch length)

LEADWIRE LENGTH

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

THERMOCOUPLE CUT-ABLE SHEATH WITH LEADWIRE

Style 38



How to build a part number

To order a United Electric Controls 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 cut-able 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 a non-standard option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction

U – Ungrounded Junction

SHEATH LENGTH

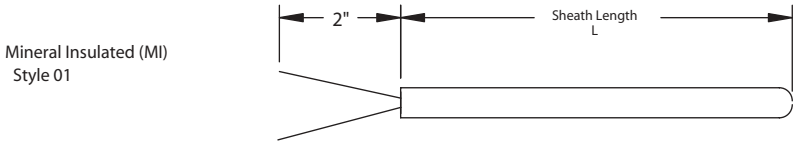
L# - (e. g., **L6** = 6 inch sheath, **L12.5** = 12.5 inch length)

LEADWIRE LENGTH

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

THERMOCOUPLE MINERAL INSULATED CABLE

Style 01



How to build a part number

To order a United Electric Controls 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 a non-standard option by adding "P" after Calibration

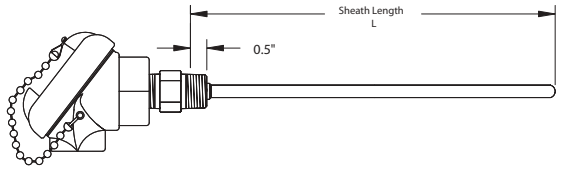
HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction
E – Exposed Junction

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

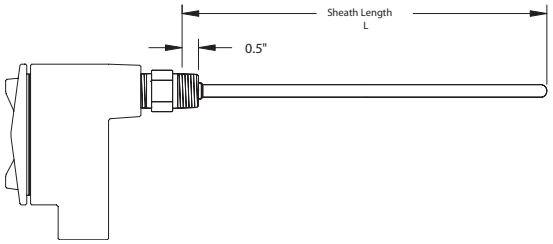
THERMOCOUPLE CONNECTION HEAD WITH HEX FITTING

Styles 15, 16, and 60

Style 15 & 16



Style 60
Explosion Proof



How to build a part number

To order a United Electric Controls 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
60 – Sheath with cast aluminum head; head approved for Class 1, Division 1, groups C, D; Class 2, Groups E, F, G. Requirements; 1/2" NPT conduit connection; plastic terminal block; 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
K – Single K
T – Single T
E – Single E
JJ – Dual J
KK – Dual K
TT – Dual T
EE – Dual E

Special Limits available as a non-standard option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction

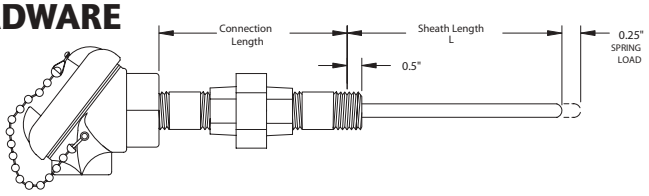
SHEATH LENGTH

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

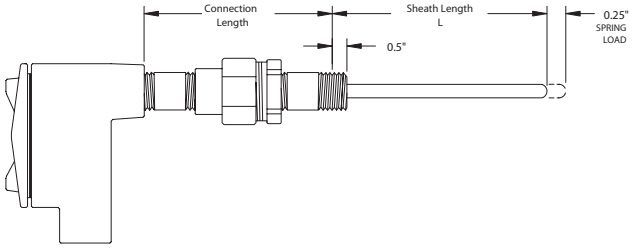
THERMOCOUPLE CONNECTION HEAD, SPRING LOAD ASSEMBLY WITH MOUNTING HARDWARE

Style 45, 46 and 47

Style 45 & 46



Style 47 Explosion Proof



How to build a part number

To order a United Electric Controls 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 for Class 1, Division 1, Groups C, D, Class 2 Groups E, F and G; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT carbon steel process connection; gasketed screw cover with stainless steel chain.

47 – Sheath with cast aluminum head; spring loaded; head approved for Class 1, Division 1, Groups C, D, Class 2 Groups E, F and G; 1/2" NPT conduit connection; plastic terminal block; screw cover; 1/2" NPT carbon steel process connection

See Style 37 and 37X 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 a non-standard option by adding "P" after Calibration

HOT JUNCTION

G – Grounded Junction
U – Ungrounded Junction

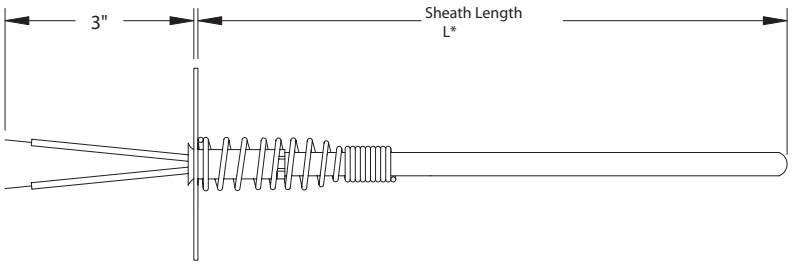
SHEATH LENGTH

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

THERMOCOUPLE SPRING LOADED REPLACEMENT ASSEMBLY

Replacement Elements - Style 37 & 37X

Style 37 & 37X



How to build a part number

To order a United Electric Controls 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.
37X – Sheath with spring loaded assembly; Teflon® insulated conductors; replacement element for use with style 47 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 a non-standard option by adding "P" after Calibration

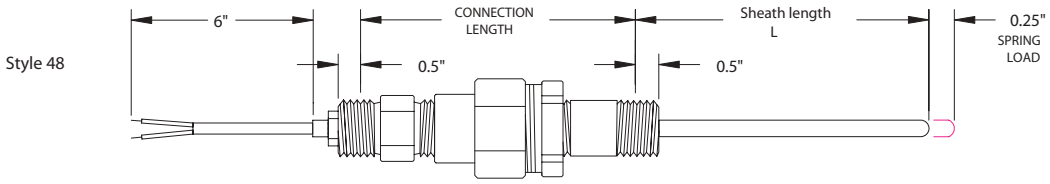
HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction

SHEATH LENGTH
L#- (e. g. L6 = 6 inch sheath)
*Sheath length comprises installation length and connection length

Temperature Sensors

THERMOCOUPLE SHEATH WITH CONNECTION HARDWARE

Style 48



How to build a part number

To order a United Electric Controls 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
48 – Sheath with connection configuration; spring loaded hex connector; no head; explosion proof union

CONNECTION
H – Head Only, not available
N – 1/2" NPT stainless steel hex fitting, 3/4" only
NU - 1/2" NPT stainless steel hex fitting with electro plate union, 2.5" 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 fittings)

CONNECTION LENGTH
###(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

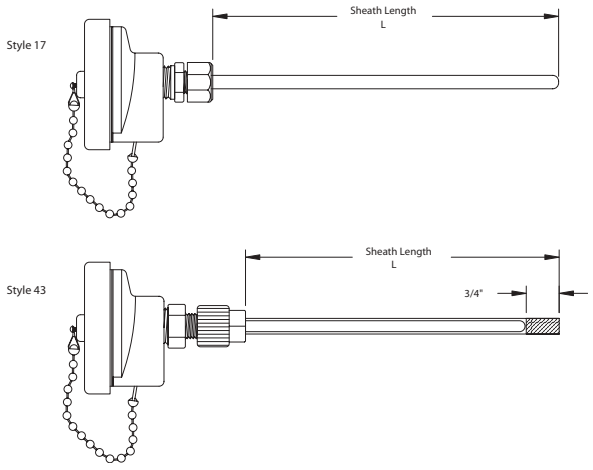
CALIBRATION – Standard Limits
J – Single J **JJ** – Dual J
K – Single K **KK** – Dual K
T – Single T **TT** – Dual T
E – Single E **EE** – Dual E
Special Limits available as a non-standard option by adding "P" after Calibration

HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction

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

THERMOCOUPLE MINIATURE WEATHERPROOF HEAD

Teflon® Sleeve Optional
Style 17 and 43



How to build a part number

To order a United Electric Controls 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
K – Single K
T – Single T
E – Single E
JJ – Dual J
KK – Dual K
TT – Dual T
EE – Dual E

Special Limits available as a non-standard option by adding "P" after Calibration

HOT JUNCTION

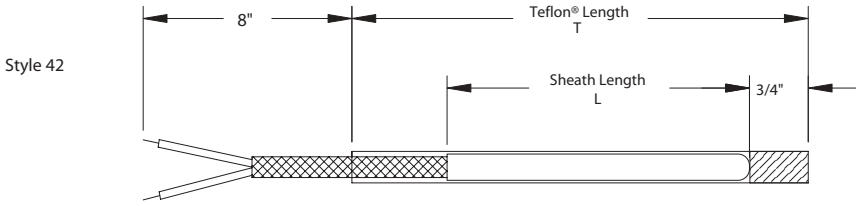
G – Grounded Junction
U – Ungrounded Junction

SHEATH LENGTH

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

THERMOCOUPLE SHEATH WITH PROTECTIVE TEFLON® SLEEVE

Style 42



How to build a part number

To order a United Electric Controls 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 a non-standard option by adding "P" after Calibration

HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction

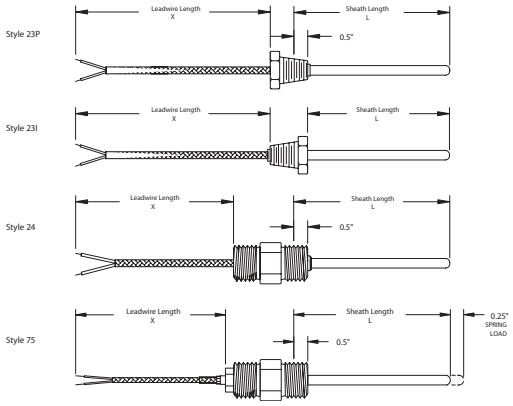
SHEATH LENGTH
L# - (e. g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

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")

THERMOCOUPLE SINGLE SIDE HEX MOUNTING AND DOUBLE SIDED PROCESS MOUNTING

Style 23P, 23I, 24 and 75



How to build a part number

To order a United Electric Controls 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; wrap fiberglass insulated conductors; fiberglass jacket;1/2"NPT stainless steel connection. Can also be used as a replacement element for Styles 15, 16 and 60
75 – Sheath with double sided mounting; fiberglass insulated conductors; fiberglass jacket; 1/2"NPT stainless steel connection; spring loaded; Sheath diameter # 7 (0.250") 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 a non-standard 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)

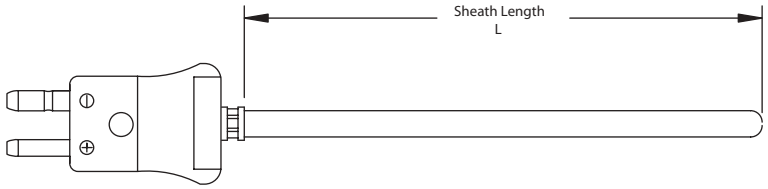
LEADWIRE LENGTH

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

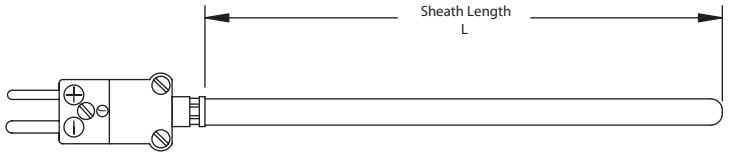
THERMOCOUPLE SHEATH WITH MALE PLUG

Style 14 and 74

Style 14



Style 74



How to build a part number

To order a United Electric Controls 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)
4 – 1/8 (0.125)
6 – 3/16 (0.188)
7 – 1/4 (0.250)

SHEATH MATERIAL
3 – 316 Stainless steel

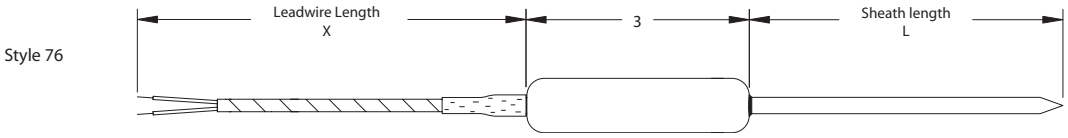
CALIBRATION – Standard Limits
J – Single J **JJ** – Dual J
K – Single K **KK** – Dual K
T – Single T **TT** – Dual T
E – Single E **EE** – Dual E
Special Limits available as a non-standard option by adding "P" after Calibration

HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction

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

THERMOCOUPLE PENETRATION PROBE WITH TEFLON® JACKET LEADWIRE

Style 76



How to build a part number

To order a United Electric Controls 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 handled 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 a non-standard option by adding "P" after Calibration

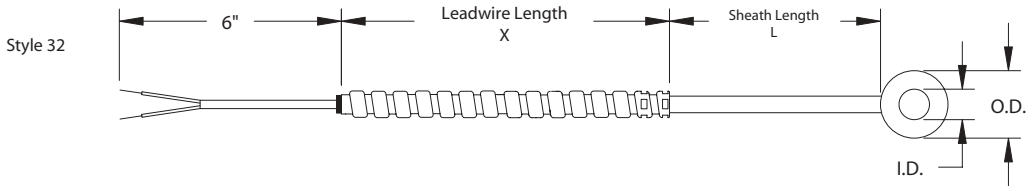
HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction

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

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

THERMOCOUPLE WASHER WITH LEADWIRE

Style 32 and 73



How to build a part number

To order a United Electric Controls 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 a non-standard 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)

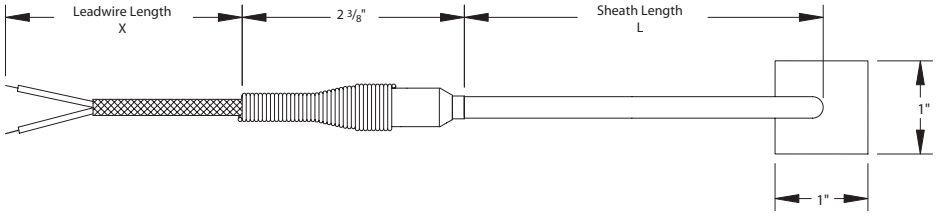
LEADWIRE LENGTH

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

THERMOCOUPLE PAD WITH LEADWIRE

Style 39

Style 39



How to build a part number

To order a United Electric Controls 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 a non standard option

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 a non-standard option by adding "P" after Calibration

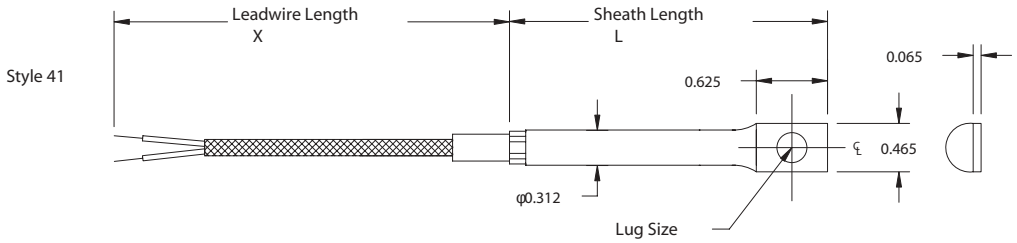
HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction

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

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

THERMOCOUPLE MOUNTING LUG WITH LEADWIRE

Style 41



How to build a part number

To order a United Electric Controls temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

Sensor Type	Assembly Style	Calibration	Hot Junction	Sheath Length	Leadwire Length	Lug Hole Size	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

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 a non-standard option by adding "P" after Calibration

HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction

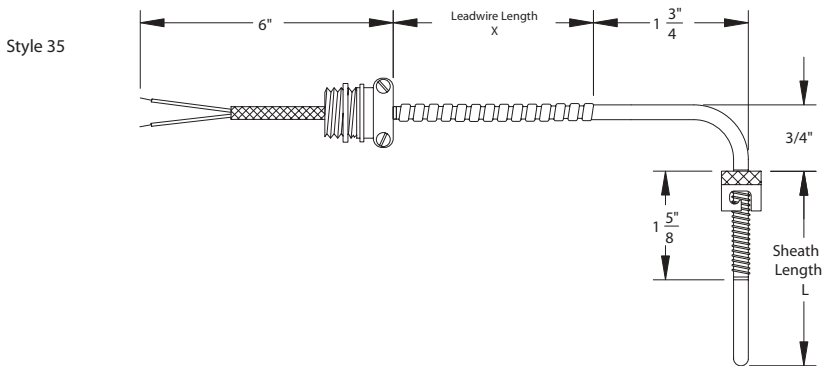
SHEATH LENGTH
L# - (e. g., L6 = 6 inch sheath)

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

LUG HOLE SIZE - Diameter of hole in Inches
6 – 3⁄16 (0.188)
7 – 1⁄4 (0.250)
9 – 3⁄8 (0.375)

THERMOCOUPLE SPRING LOADED BAYONET FITTING WITH ARMOR

Style 35, 70 and 71



How to build a Part Number

To order a United Electric Controls 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
70 – Sheath with St/St armor; fiberglass insulated conductors; fiberglass jacket; spring loaded bayonet cap; 45 degree bend; 1/2" BX connector
71 – Sheath with St/St armor; fiberglass insulated conductors; fiberglass jacket; 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

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 a non-standard option by adding "P" after Calibration

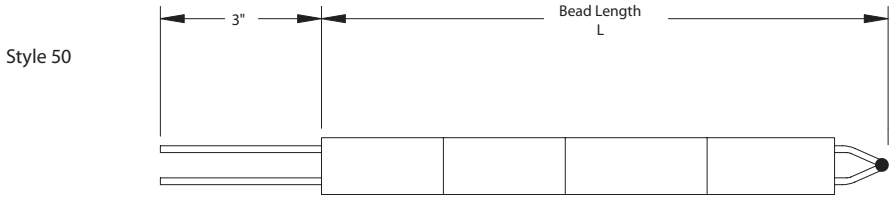
HOT JUNCTION
G – Grounded Junction
U – Ungrounded Junction

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

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

BEADED THERMOCOUPLE

Style 50



How to build a part number

To order a United Electric Controls 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; replacement element

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 a non-standard option by adding "P" after Calibration

HOT JUNCTION
E – Exposed Junction
TE – Twisted Exposed Junction

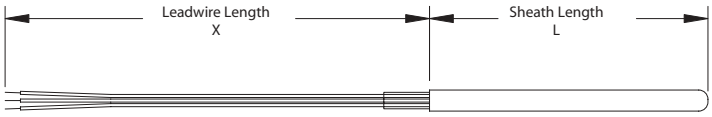
BEAD LENGTH
L# - (e. g., L6 = 6 inch sheath)

INSULATORS
M - Mullite
A - Alumina

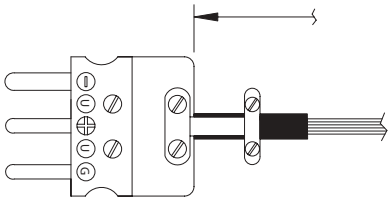
RTD SHEATH WITH LEADWIRE – Plugs, Overbraid and Teflon® Sleeve Optional

Style 02, 05, 07, 20 & 28

Style 02, 20 & 28



Standard Male Plug
Style 05 & 07



How to build a part number

To order a United Electric Controls 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	Temp. 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
07 – Sheath with leadwire; Teflon® insulated conductors; overbraid; Teflon® jacket; standard male plug
20 – Sheath with leadwire; Teflon® insulated conductors; no jacket
28 – Sheath with Teflon® jacketed cable; Teflon® insulated conductors

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

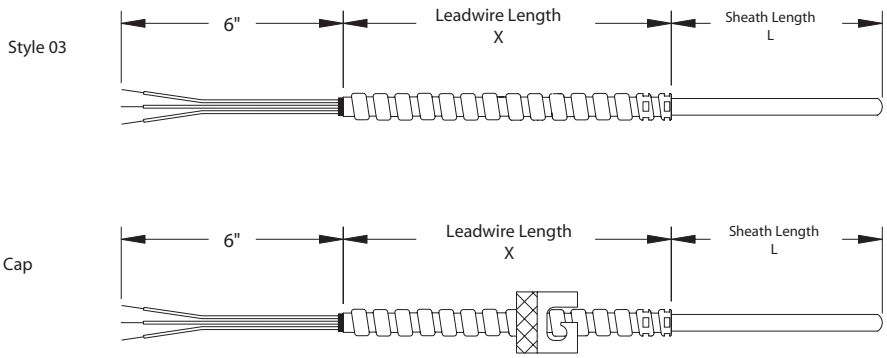
TEMPERATURE RANGE – Maximum Range
1 – -45 to 260°C (-50 to 500°F)
2 – -45 to 482°C (-50 to 900°F)
RTN1 limited to 232°C(450°F)
RTC1 limited to Temp. Range 1

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

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

RTD SHEATH WITH LEADWIRE AND ARMOR CABLE

Styles 03 and 25



How to build a part number

To order a United Electric Controls 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	Temp. 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

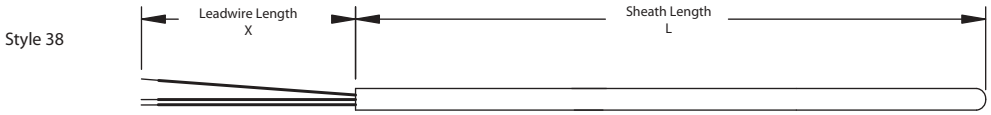
TEMPERATURE RANGE – Maximum Range
1 – -45 to 260°C (-50 to 500°F)
2 – -45 to 482°C (-50 to 900°F)
RTN1 limited to 232°C(450°F)
RTC1 limited to Temp. Range 1

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

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

RTD CUTABLE SHEATH WITH LEADWIRE

Style 38



How to build a Part Number

To order a United Electric Controls 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	Temp. 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 cutable sheath length with leadwire; Teflon® insulated conductors for Temperature range 1; Fiberglass insulated conductors for Temperature range 2; Cannot be cut to less than 4"

SHEATH DIAMETER (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

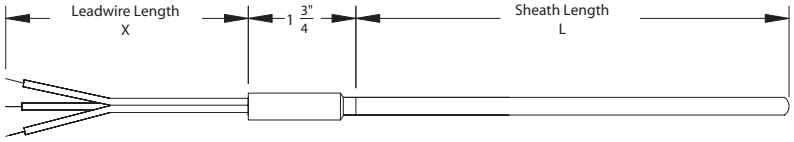
SHEATH LENGTH
L# - (e. g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

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

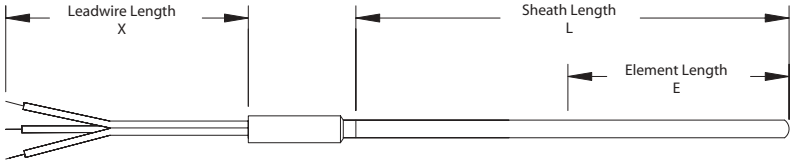
RTD MINERAL INSULATED CABLE AND AVERAGING

Style 63 and 44

Mineral Insulated (MI)
Style 63



Averaging RTD
Style 44



How to build a part number

To order a United Electric Controls 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	Temp. Range	Sheath Length	Leadwire Length	Element Length	Options

SENSOR TYPE
RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3 wire construction
RTP6 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 2 wire construction
RTP11 – Platinum, DIN 0.00385; 100 ohm +/- 0.5% @ O°C; 3 wire construction

ASSEMBLY STYLE
63 – Sheath with leadwire; Teflon® insulated conductors; Mineral Insulated cable; High Temperature; single element only; sheath diameter #7 only
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)
3 – -45 to 788°C (-50 to 1450°F)
Range 1 Style 44 only
Range 2 Both Styles
Range 3 Style 63 only

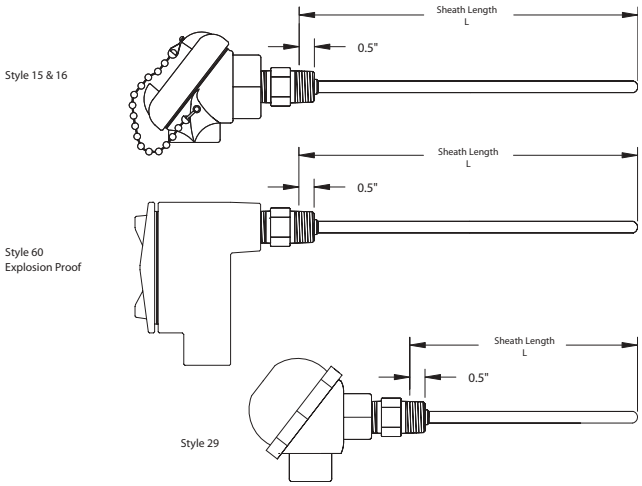
SHEATH LENGTH
L# - (e. g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

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

ELEMENT LENGTH
Style 44 Only
E# - (e. g., E6 = 6 inch length)

RTD CONNECTION HEAD WITH HARDWARE

Style 15, 16, 60 and 29



How to build a part number

To order a United Electric Controls 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	Temp. 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
60 – Sheath with cast aluminum head; head approved for Class 1, Division 1, Groups C, D; Class 2 Groups E, F, G;1/2" NPT conduit connection; plastic terminal block; 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)

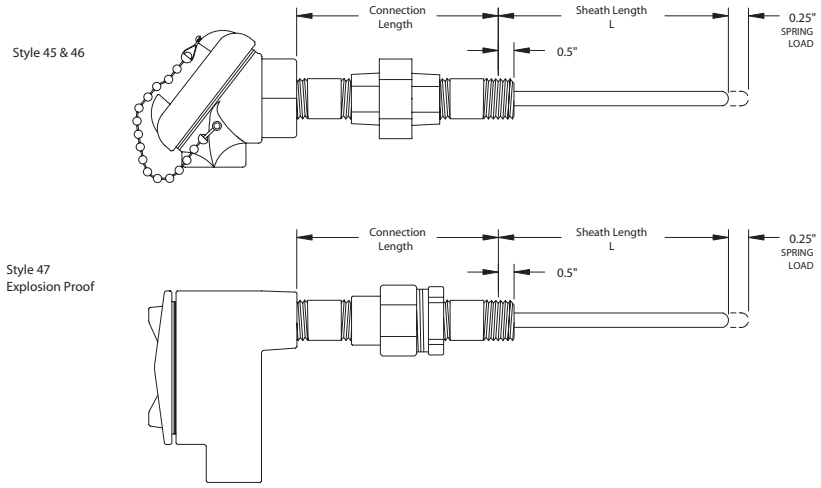
SHEATH MATERIAL
3 – 316 Stainless steel

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

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

RTD CONNECTION HEAD WITH HARDWARE, SPRING LOADED

Style 45, 46 and 47



How to build a part number

To order a United Electric Controls 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	Temp. 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
47 – Sheath with cast aluminum head; spring loaded; head approved for Class 1 Division 1 Groups C, D; class 2 . Groups E, F, G, including union; 1/2" NPT conduit connection; plastic terminal block; 1/2" NPT Carbon steel process connection

See Style 37 and 37X 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)

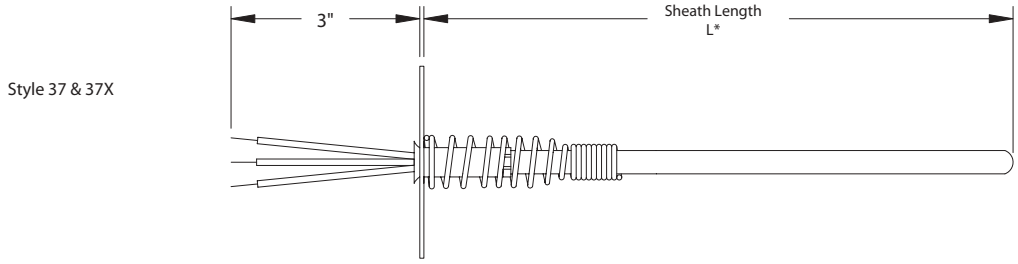
SHEATH MATERIAL
3 – 316 Stainless steel

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

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

RTD SPRING LOADED

Style 37 & 37X



How to build a Part Number

To order a United Electric Controls 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	Temp. 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 when ordering this replacement style.
37X – Sheath with spring loaded assembly; Teflon® insulated conductors; replacement element for use with style 47
Specify original probe when ordering this replacement style.

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

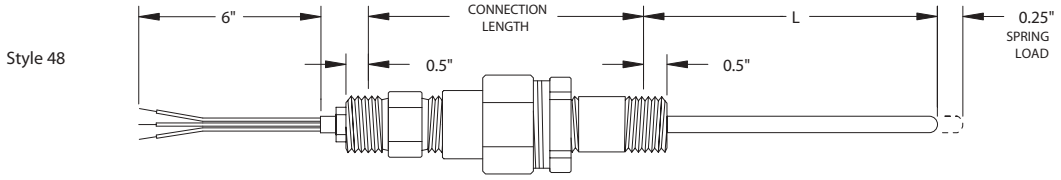
SHEATH MATERIAL
3 – 316 Stainless steel

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

RTD SHEATH WITH HEX CONNECTION, SPRING LOADED

Style 48



How to build a part number

To order a United Electric Controls 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	Temp. 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
48 – Sheath with connection configuration; spring loaded hex connector; no head; explosion proof union

CONNECTION
H – Head Only, Not available
N – 1/2" NPT Stainless steel hex fitting – 3/4" only
NU - 1/2" NPT Stainless steel hex fitting with electro plate union - 2.5 " 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 fittings)

CONNECTION LENGTH
- (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)

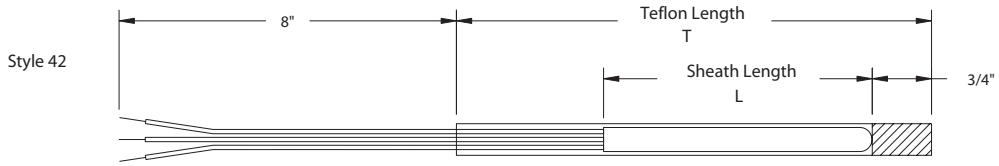
SHEATH MATERIAL
3 – 316 Stainless steel

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)

RTD SHEATH WITH LEADWIRE AND PROTECTIVE TEFLON® SLEEVE

Style 42



How to build a part number

To order a United Electric Controls 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	Temp. 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, Teflon® insulated leadwire 8" 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)

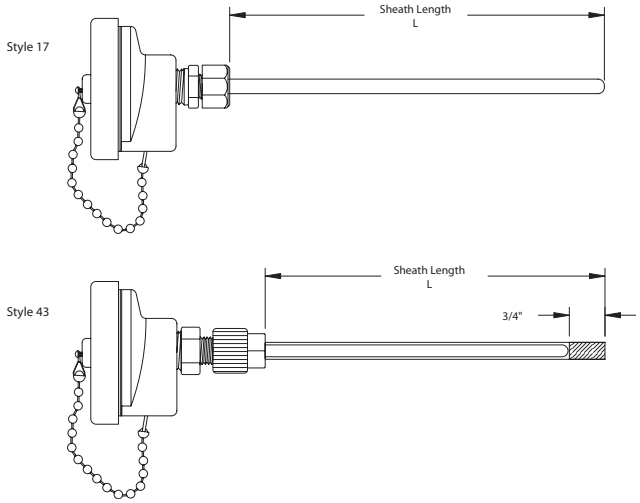
SHEATH LENGTH
L# - (e. g., L6 = 6 inch sheath, L12.5 = 12 1/2 inch length)

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)

RTD MINIATURE WEATHERPROOF HEAD - Teflon® Sleeve Optional

Style 17 and 43



How to build a part number

To order a United Electric Controls 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	Temp. 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)

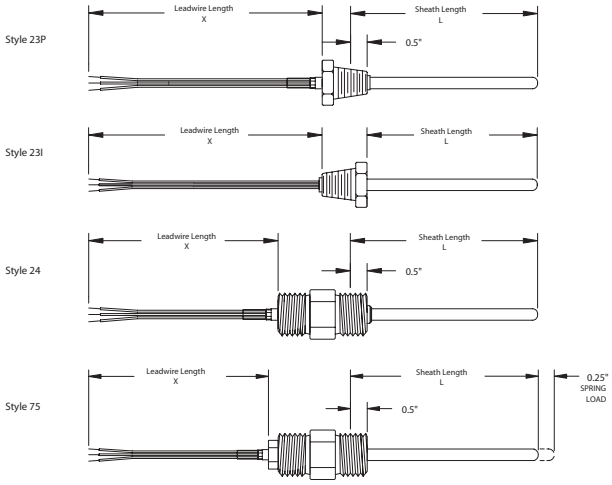
2 – -45 to 482°C (-50 to 900°F)
Style 17 only

SHEATH LENGTH

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

RTD DOUBLE SIDED PROCESS MOUNTING SINGLE SIDED HEX MOUNTING

Style 23P, 23I, 24 and 75



How to build a Part Number

To order a United Electric Controls 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	Temp. 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 60

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

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

75 – Sheath with double sided process mounting; Teflon® insulated conductors; 1/2"NPT stainless steel connection; spring loaded; Sheath diameter #7 and #9 only

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)

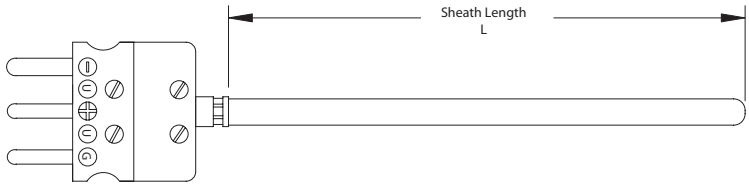
LEADWIRE LENGTH

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

RTD SHEATH WITH MALE PLUG

Style 14

Style 14



How to build a part number

To order a United Electric Controls 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	Temp. 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

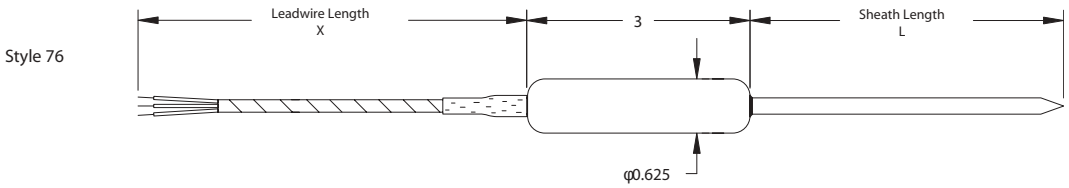
1 – -45 to 260°C (-50 to 500°F)
2 – -45 to 482°C (-50 to 900°F)

SHEATH LENGTH

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

RTD PENETRATION PROBE TEFLON® JACKET LEADWIRE

Style 76



How to build a part number

To order a United Electric Controls 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	Temp. 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 handled 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

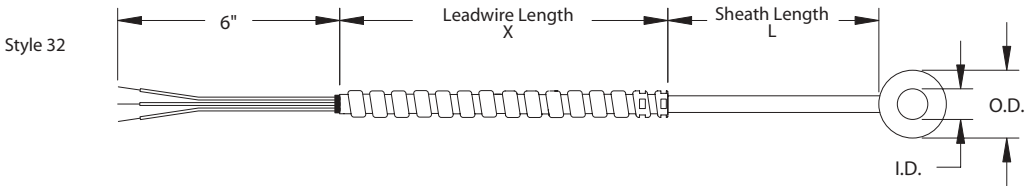
L# - (e. g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

LEADWIRE LENGTH

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

RTD WASHER WITH LEADWIRE

Styles 32 and 73



How to build a part number

To order a United Electric Controls 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	Temp. 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	Actual Washer 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)

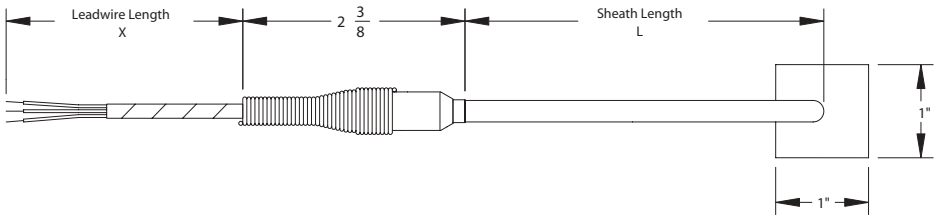
SHEATH LENGTH
L# – (e. g., L6 = 6 inch sheath)

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

RTD PAD WITH LEADWIRE

Style 39

Style 39



How to build a part number

To order a United Electric Controls 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	Temp. 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 NON standard option.

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)

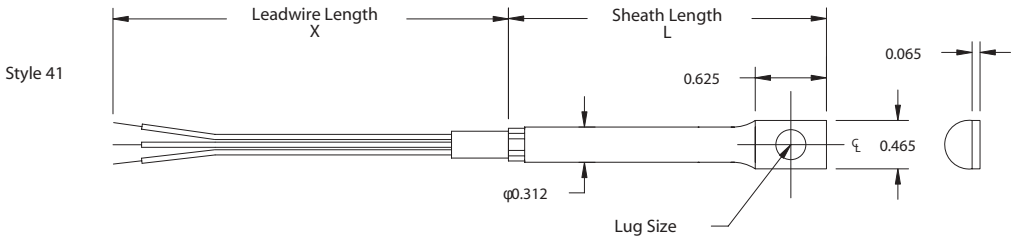
SHEATH LENGTH
L# - (e. g., L6 = 6 inch sheath)

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

Temperature Sensors

RTD MOUNTING LUG WITH LEADWIRE

Style 41



How to build a part number

To order a United Electric Controls 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	Temp. Range	Sheath Length	Leadwire Length	Lug Hole Size	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

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)

LUG HOLE SIZE

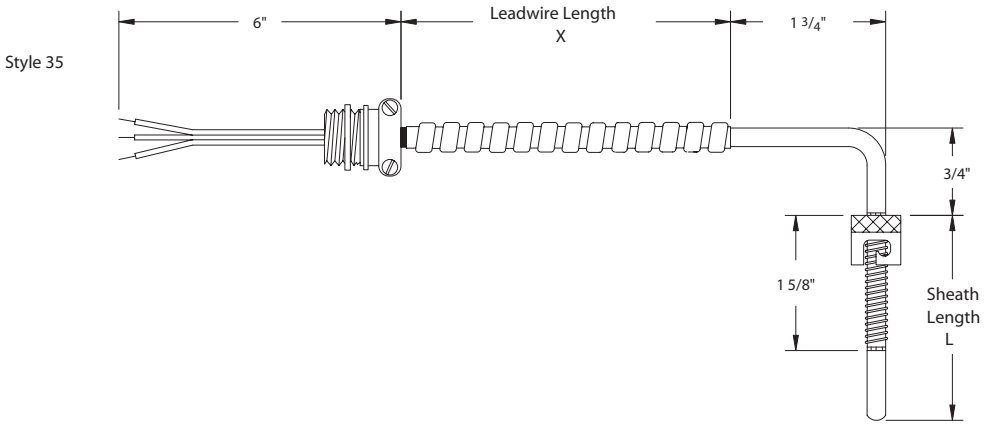
6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

RTD SPRING LOADED BAYONET FITTING WITH ARMOR

Style 35, 70 and 71



How to build a part number

To order a United Electric Controls 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	Temp. 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)

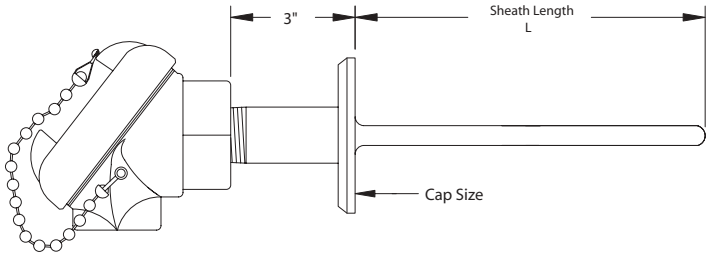
SHEATH LENGTH
L# - (e. g., L6 = 6 inch sheath)

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

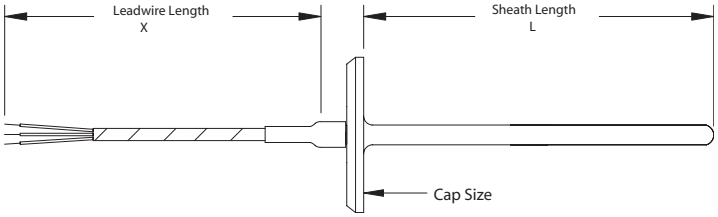
RTD SANITARY CONNECTION WITH HEAD OR LEADWIRE

Style 33, 58 and 67

Style 33



Style 58



How to build a part number

To order a United Electric Controls 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	Temp. 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; 3" nipple and cap comply with 3A standard; maximum termination temperature 104°C (220°F)
58 – Sheath with leadwire; Teflon® insulated conductors; Teflon® jacketed cable; sanitary process connection; stainless steel sheath and cap comply with 3A standard; 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; 3" nipple and cap comply with 3A standards.

CAP SIZE (in inches)

A – 0.50
B – 0.75
C – 1.00
D – 1.50
E – 2.00
F – 2.50
G – 3.00
H – 4.00

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)

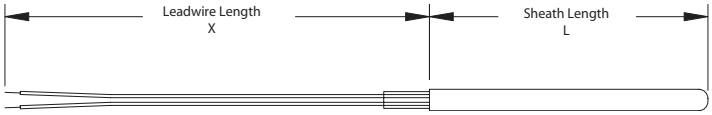
LEADWIRE LENGTH

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

THERMISTORS - SHEATH WITH LEADWIRE

Style 20 & 28

Style 20 & 28



How to build a part number

To order a United Electric Controls 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	Temp. 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 1only
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)

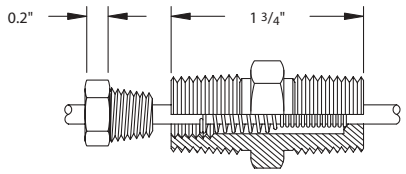
LEADWIRE LENGTH

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

FITTING OPTIONS

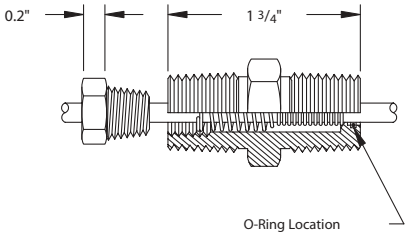
Hex Connectors

SPRING LOADED HEX CONNECTORS



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"

SPRING LOADED HEX CONNECTORS WITH O-RING

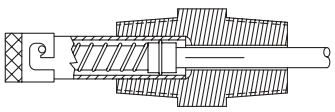


Option Code	Process Connection	Conduit Connection	Sensor Size
PF21	1/2" NPT	1/2" NPT	3/16"
PF22	1/2" NPT	1/2" NPT	1/4"
PF25	3/4" NPT	1/2" NPT	3/16"
PF26	3/4" NPT	3/4" NPT	1/4"

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

Maximum pressure rating to 15 psi.
Buna N O-ring temperature range -23 to 93°C (-10 to 200°F)

SPRING LOADED HEX CONNECTORS

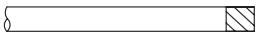


Option Code	Process Connection	Conduit Connection	Sensor Size
PF29	1/2" NPT	1/2" NPT	3/16"
PF30	1/2" NPT	1/2" NPT	1/4"

TIP CONFIGURATION OPTIONS

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

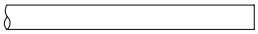
GENERAL



OPTION CODE	DESCRIPTION
PS01	Copper Tip

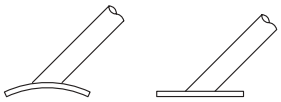
PS02	Point tip for piercing

PS03	Perforated housing for air flow sensing

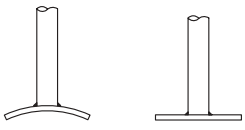


PS04	Flat tip
PS05	PVC tip insulation for use with Style 40
PS06	Teflon tip insulation for use with Style 40

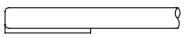
WELD PAD ASSEMBLIES



OPTION CODE DESCRIPTION	
PW45F	45 degree angle, flat weld pad
PW45R	45 degree angle, rounded weld pad



PW90	90 degree angle, perpendicular weld pad



PW00	Horizontal weld pad

To change a flat pad to a radius, add suffix code from below. Example PW45R10

Code	Nominal pipe size
R10	1″
R15	1.5″
R20	2.0″
R25	2.5″
R30	3.0″
R35	3.5″
R40	4.0″

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	320	110	71	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	1,202	550	343
-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

Temperature Sensors

INDEX

UNITED ELECTRIC CONTROLS
SENSOR PRODUCT GROUP

PHONE: 617-926-1000
FAX: 617-926-8411
E-Mail: sensorsales@ueonline.com

Customer Information
Name:_____ Phone:_____
Company:_____ Fax: _____
Address:_____ E Mail:_____
_____

Temperature Sensor Information
Thermocouple
Sensor Type_____ Calibration_____ Single/Dual_____
Grounded/Ungrounded/Exposed Junction (Circle one)

RTD or Thermistor (Circle one)
Sensor Type_____ Temperature Range_____

Sensor Style
Head/Plug Style (if any)_____ Leadwire Length_____
Sheath (Tube) Length _____ Sheath (Tube) Material_____
Connection Configuration (N, NU or NUN)_____
Mounted: Horizontal_____ Vertical_____ Other (Specify)_____

Working Media
Air____ Inert Gas_____ Water____ Other Fluid (Specify)_____

Special Considerations
Vibration_____ Shock_____ Other (Specify)_____

Working Temperatures
Ambient Temperature Minimum_____ °C/°F Maximum_____ °C/°F
Temperature to be Measured Minimum_____ °C/°F Maximum_____ °C/°F

Installation Location
Indoor_____ Outdoor_____ Protected_____ Unprotected_____

Thermowell Information
Type_____ Length_____ Material_____ Other_____

Other Information (Cross over part numbers, etc.)

Please contact United Electric for further information or for answers to any questions

RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable 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.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. 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 in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- For all applications, a factory set unit should be tested before use.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Use only factory authorized replacement parts and procedures.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY OF REPAIR AND REPLACEMENT

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 (F.O.B. UE Watertown); provided, however, that this warranty applies only to equipment found to be so defective within a period of 18 months from the date of manufacture by the Seller (36 months for the Spectra 12 and One Series products). 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.

LIABILITY LIMITATION

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE IMPUTED TO SELLER, IS LIMITED TO THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED HEREIN. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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