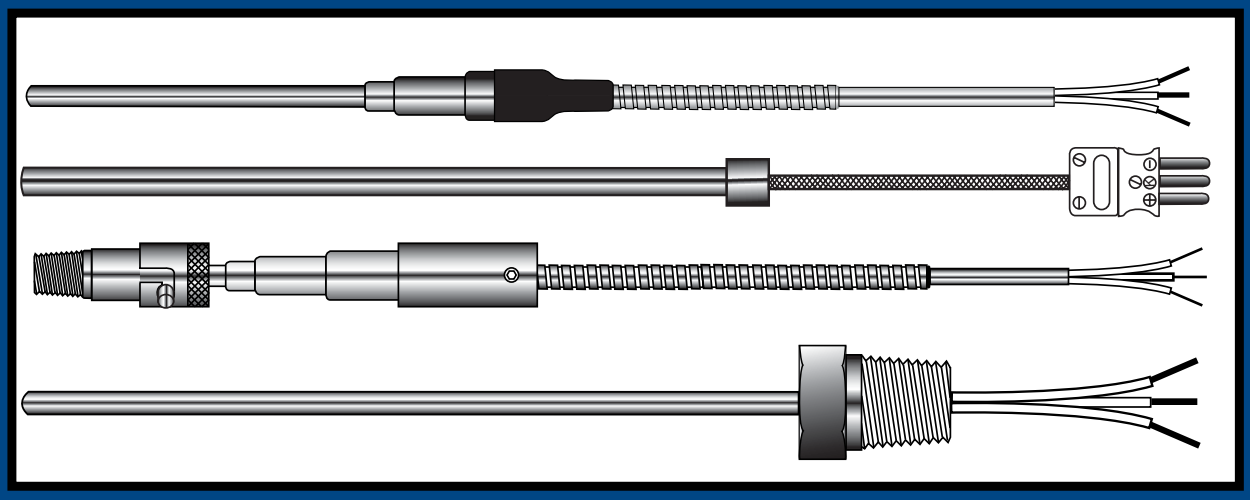
SECTION 2

RTD'S

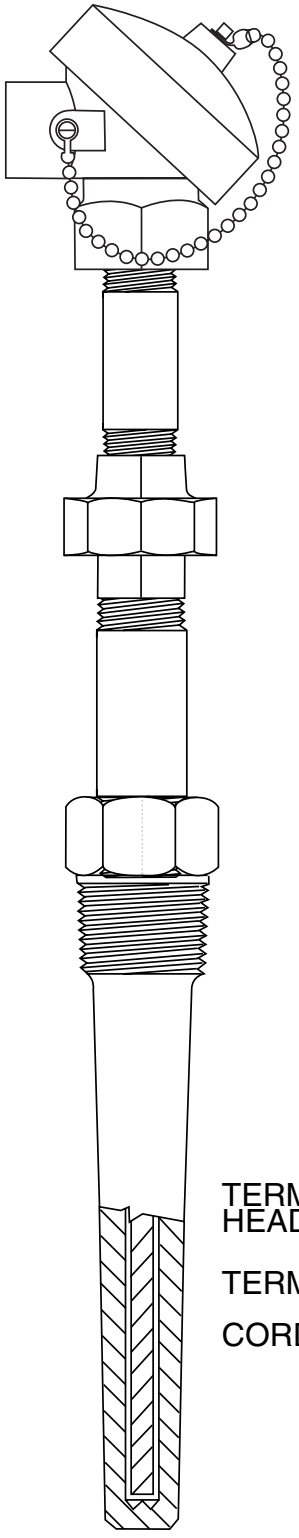


RTD INDEX - SECTION 2

RTD Assembly Ordering Information.....24
Terminal Heads:
Cast Iron.....25
Cast Aluminum.....25
Small Cast Aluminum.....25
Stainless Steel.....26
Screw Cover-Polypropylene.....26
Hinged Polypropylene and Aluminum.....26
Explosion Proof.....27
Canister.....27
Terminal & Barrier Blocks:
Ceramic Terminal Blocks.....28
Uncompensated Barrier Blocks.....28
Extensions:
Nipple Assemblies.....29
Nipple-Union Assemblies.....29
Nipple-Union-Nipple Assemblies.....29
RTD Elements:
Basic RTD.....30
With Extended Leads.....31
With Armored Extended Leads.....32
With Double Threaded Fixed Fitting.....33
With Double Threaded Spring Loaded Fitting...34
With Fixed Threaded Fitting.....35
With Spring Loaded Hardware.....36
RTD Technical Data.....37-41

RTD ASSEMBLIES

ORDERING INFORMATION



To specify RTD assembly, follow the steps shown below:

For Types 1, 4, S4, and 6:
- Step 1 - Specify Terminal Head from pages 25, 26, and 27.
- Step 2 - Specify Terminal Block from page 28.
- Step 3 - Specify Extension Type (if required) from page 29
- Step 4 - Specify RTD Element from pages 30, 33, 34, 35, and 36.
- Step 5 - Specify Thermowell or Protection Tube from Section 3.

EXAMPLE:

C2D - U6 - 6P34 - 14 - 103S - R - 4.5

TERMINAL HEAD
TERMINAL BLOCK
EXTENSION
RTD
THERMOWELL

For Types 2, and 3:
- Step 1 - Specify Terminal Head from pages 25-27.
- Step 2 - Specify Terminal Block from 28
- Step 3 - Specify Cord Grip Connector (if required) from 71.
- Step 4 - Specify RTD Element from pages 31 and 32.
- Step 5 - Specify Compression Fitting (if required) from page 71.
- Step 6 - Specify Thermowell or Protection Tube (if required) from Section 3.

EXAMPLE:

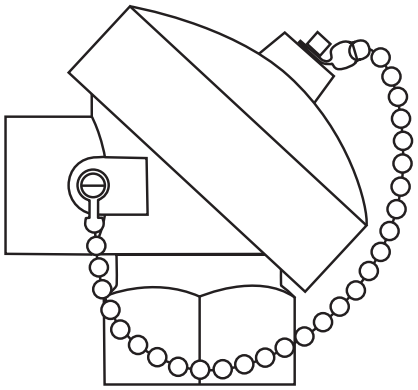
A2S - G3 - 3P34 - 12 -SH36 - TFE24 - 42 - SA4 - 4 - 703 - R - CVR - 8

TERMINAL HEAD
TERMINAL BLOCK
CORD GRIP CONNECTOR
RTD
COMPRESSION FITTING
THERMOWELL

TERMINAL HEADS

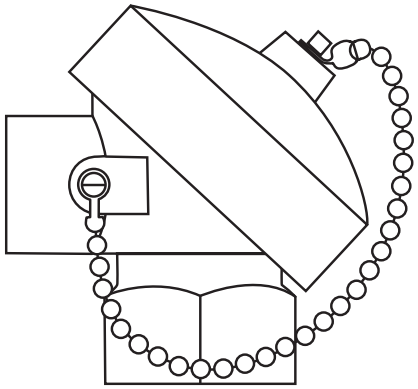
General Purpose - Weather- Proof

CAST IRON



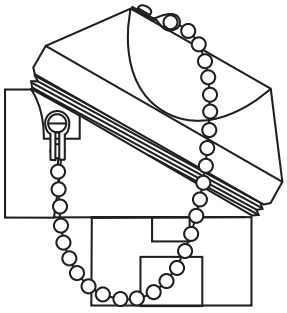
PART NO.	CONDUIT CONNECTION	INSTRUMENT CONNECTION
C1	1/2" NPT	1/2" NPT
C2	3/4" NPT	1/2" NPT
C3	3/4" NPT	3/4" NPT
C4	3/4" NPT	1" NPT

CAST ALUMINUM



PART NO.	CONDUIT CONNECTION	INSTRUMENT CONNECTION
A1	1/2" NPT	1/2" NPT
A2	3/4" NPT	12" NPT
A3	3/4" NPT	3/4" NPT
A4	3/4" NPT	1" NPT

SMALL CAST ALUMINUM

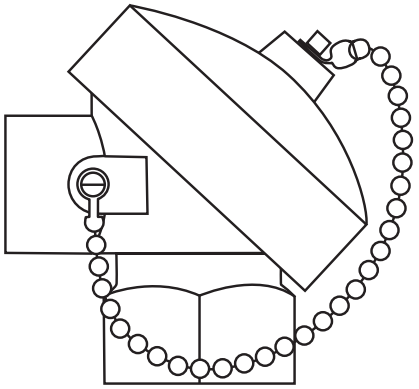


PART NO.	CONDUIT CONNECTION	INSTRUMENT CONNECTION
A5	1/2" NPT	1/2" NPT
A6	3/4" NPT	1/2" NPT
A7	3/4" NPT	3/4" NPT
A8	3/4" NPT	1" NPT

TERMINAL HEADS

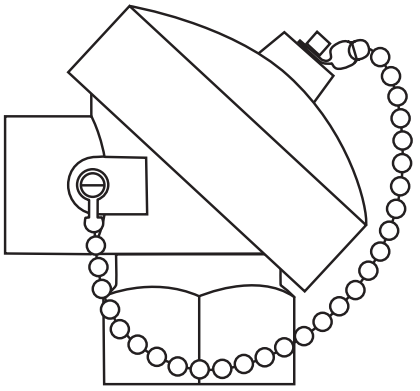
General Purpose - Weather- Proof

STAINLESS STEEL



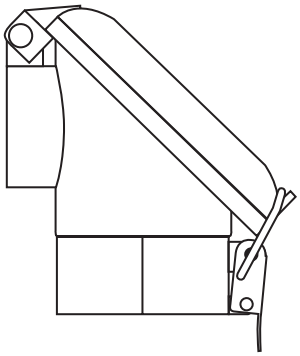
PART NO.	CONDUIT CONNECTION	INSTRUMENT CONNECTION
S1	1/2" NPT	1/2" NPT
S2	3/4" NPT	1/2" NPT
S3	3/4" NPT	3/4" NPT
S4	3/4" NPT	1" NPT

SCREW COVER - POLYPROPYLENE



PART NO.	CONDUIT CONNECTION	INSTRUMENT CONNECTION	COLOR
P2	1/2" NPT	1/2" NPT	BLACK
P3	3/4" NPT	1/2" NPT	FDA APPROVED WHITE

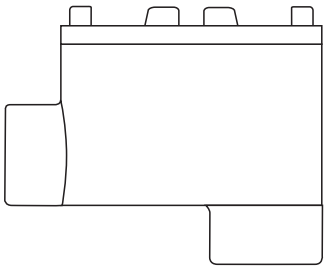
HINGED COVER - FLIP TOP TERMINAL HEADS



PART NO.	MATERIAL AND COLOR	CONDUIT CONNECTION	INSTRUMENT CONNECTION
H1	FDA APPROVED WHITE POLYPROPYLENE	3/4" NPT	1/2" NPT
H2	FDA APPROVED WHITE POLYPROPYLENE	3/4" NPT	3/4" NPT
H3	BLACK POLYPROPYLENE	3/4" NPT	1/2" NPT
H4	BLACK POLYPROPYLENE	3/4" NPT	3/4" NPT
H5	ALUMINUM	1/2" NPT	1/2" NPT
H6	ALUMINUM	3/4" NPT	1/2" NPT
H7	ALUMINUM	3/4" NPT	3/4"NPT
H8	ALUMINUM	3/4" NPT	1" NPT

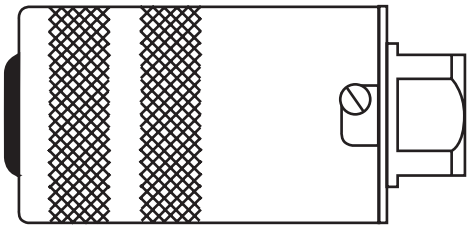
TERMINAL HEADS

EXPLOSION PROOF



PART NO.	CONDUIT CONNECTION	INSTRUMENT CONNECTION
EB1	1/2" NPT	1/2" NPT
EB2	3/4" NPT	1/2" NPT
EB3	3/4" NPT	3/4" NPT
EB4	3/4" NPT	1" NPT

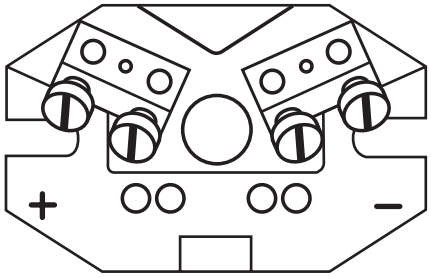
CANISTER TYPE MINIATURE ALUMINUM TERMINAL HEADS WITH CERAMIC TERMINAL BLOCKS



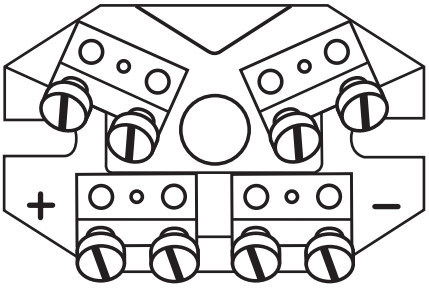
PART NO.	CONDUIT CONNECTION	NUMBER OF TERMINALS
M1	1/4" NPT	2
M2	1/8" NPT	2
M3	1/4" NPT	3
M4	1/8" NPT	3
M5	1/4" NPT	4
M6	1/8" NPT	4

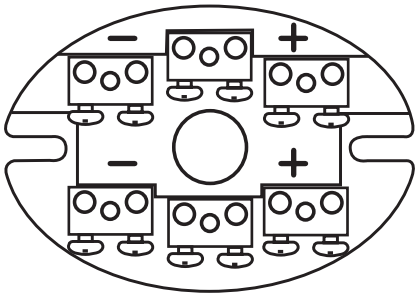
TERMINAL AND BARRIER BLOCKS

CERAMIC TERMINAL BLOCKS

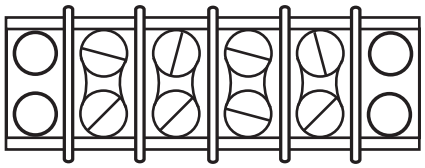


CODE	PART NUMBER & DESCRIPTION
S	TB2 -Single Terminal Block
D	TB4 - Dual Terminal Block
T	TB6 - Triplex Terminal Block



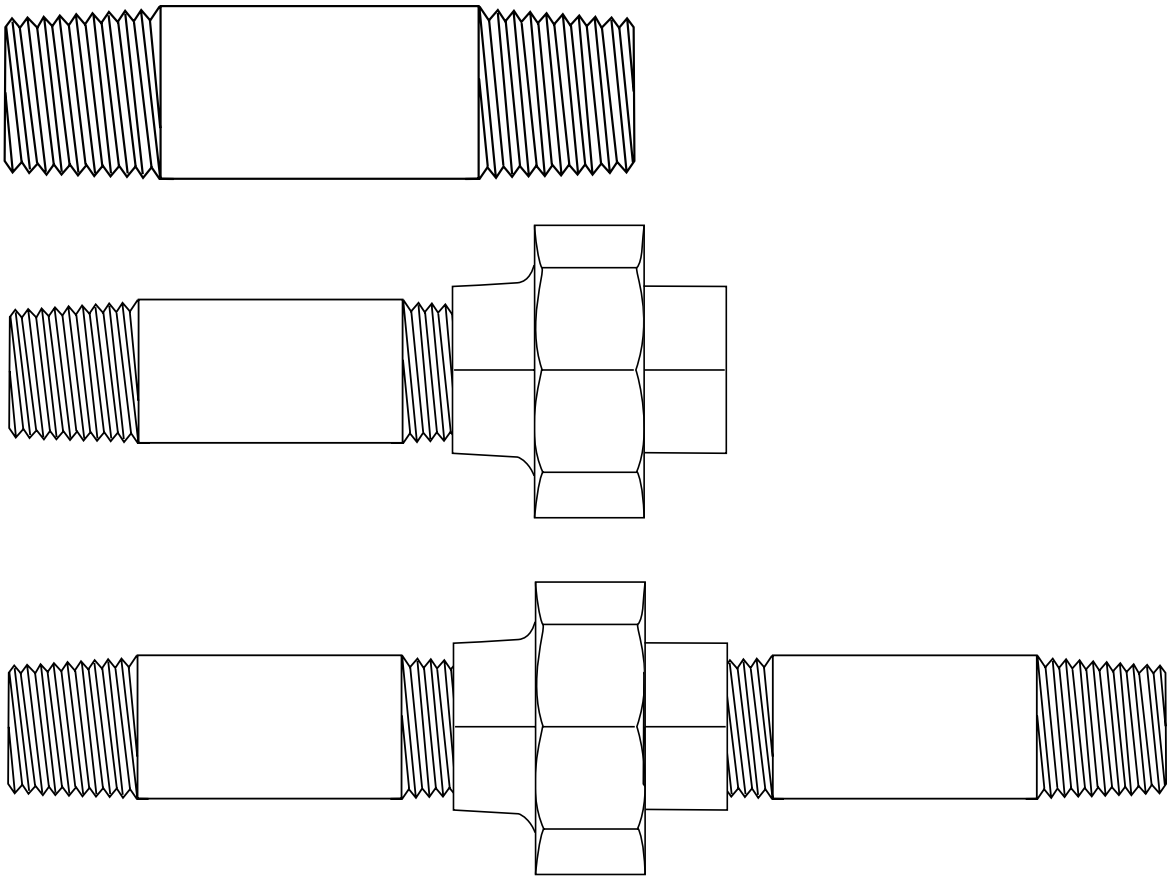


UNCOMPENSATED BARRIER BLOCKS



PART NO.	NO. OF TERMINALS
BB2	2
BB4	4
BB6	6
BB8	8
BB10	10
BB12	12
BB14	14

EXTENSIONS



EXTENSION CODE	CONSTRUCTION
N	NIPPLE ONLY
U	NIPPLE-UNION-NIPPLE
UN	UNION-NIPPLE
CN	COUPLING-NIPPLE

MATERIAL CODE	MATERIAL
NO CODE	GALVANIZED STEEL
B	BLACK IRON
SS	304SS
R	316SS
X	OTHER

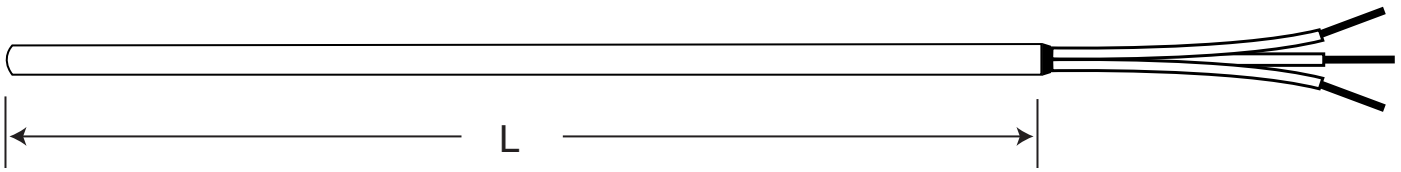
Specify extension code, extension length and material. Extension thread size is determined by the terminal head and thermowell connections.

Example: U4SS (Nipple-Union-Nipple, 4", 304SS Material)

If ordering extension only, specify code, extension length, material and thread size.

Example: U4SS-1/2" NPT (Nipple-Union-Nipple 4", 304SS Material, 1/2" NPT)

RTD SENSOR - TYPE 1



ORDER EXAMPLE---------- 1 - 2P - 3 - 4 - 12 - R - 6 - TEMP

DESIGN TYPE

SENSOR TYPE

P - 100 OHM Platinum
Q - 200 OHM Platinum
R - 500 OHM Platinum
S - 1000 OHM Platinum

T - 100 OHM Nickel
U - 120 OHM Nickel
V - 10 OHM Copper
W - 100 OHM Copper
X - Other

NO. OF WIRES

2,3,4
FOR DUAL 4,6,8

SHEATH DIAMETER*

2 - 1/8" (.125)
3 - 3/16" (.188)
4 - 1/4" (.250)
5 - 5/16" (.313)

SHEATH LENGTH IN INCHES

SHEATH MATERIAL

P - 304SS
R - 316SS
Q - 310SS

J - INCONEL 600
X - OTHER

LEAD LENGTH IN INCHES

MAX. TEMP. RANGE

362° NO CODE
962° CODE HT**

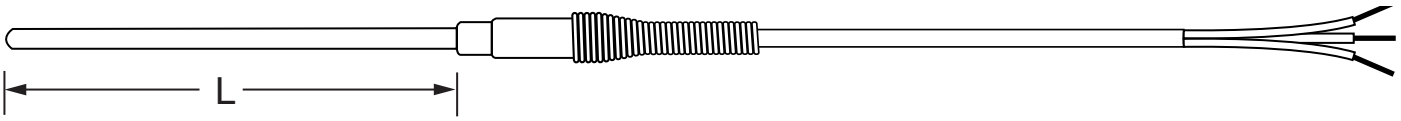
For Dual Sensors Designate As 2 + Sensor Code.
EX: Dual 100 OHM Platinum = 2P

* NOTE: For Smaller Diameter Sensors, Consult TMS.

** NOTE: Sensors with Code "HT" will be provided with Fiberglass Leads.
Sensors with No Code (362°F) will be provided with Teflon Lead unless otherwise specified.

RTD SENSOR -TYPE 2

Type 2 With Extended Leads



ORDER EXAMPLE---------- 2 - U - 4 - 4 - 24 - R - GG - 24 - 36 - TEMP

DESIGN TYPE

SENSOR TYPE

P - 100 OHM Platinum
Q - 200 OHM Platinum
R - 500 OHM Platinum
S - 1000 OHM Platinum
T - 100 OHM Nickel
U - 120 OHM Nickel
V - 10 OHM Copper
W - 100 OHM Copper
X - Other

NO. OF WIRES

2,3,4
FOR DUAL 4,6,8

SHEATH DIAMETER*

2 - 1/8" (.125)
3 - 3/16" (.188)
4 - 1/4" (.250)
5 - 5/16" (.313)

"L" LENGTH IN INCHES

SHEATH MATERIAL

P - 304SS
R - 316SS
Q - 310SS
J - INCONEL 600
X - OTHER

LEAD WIRE INSULATION

TT - Teflon
GG - Fiberglass

LEAD WIRE AWG

24 AWG Standard

LEAD WIRE LENGTH IN INCHES

MAX. TEMP. RANGE

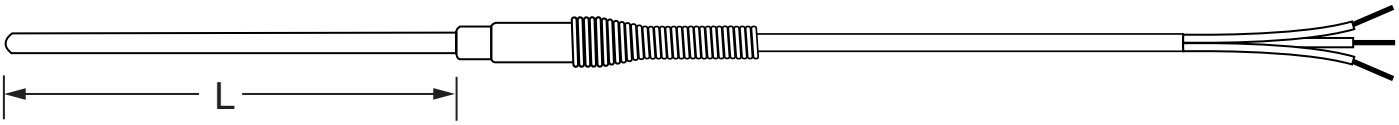
362° NO CODE
962° CODE HT**

For Dual Sensors Designate As 2 + Sensor Code.
EX: Dual 100 OHM Platinum = 2P

* NOTE: For Smaller Diameter Sensors, Consult TMS.
** NOTE: Sensors with Code "HT" will be provided with Fiberglass Leads.
Sensors with No Code (362°F) will be provided with Teflon Lead unless otherwise specified.

RTD SENSOR - TYPE 3

Type 3 With Extended Armored Leads



ORDER EXAMPLE---------- 3 - 2P - 3 - 4 - 12 - R - TH - 36 - TT - 6 - TEMP

DESIGN TYPE

SENSOR TYPE

P - 100 OHM Platinum
Q - 200 OHM Platinum
R - 500 OHM Platinum
S - 1000 OHM Platinum
T - 100 OHM Nickel
U - 120 OHM Nickel
V - 10 OHM Copper
W - 100 OHM Copper
X - Other

NO. OF WIRES

2,3,4
FOR DUAL 4,6,8

SHEATH DIAMETER*

2 - 1/8" (.125)
3 - 3/16" (.188)
4 - 1/4" (.250)
5 - 5/16" (.313)

SHEATH LENGTH IN INCHES

SHEATH MATERIAL

P - 304SS
R - 316SS
Q - 310SS
J - INCONEL 600
X - OTHER

ARMOR

SH - Stainless Steel
PH - PVC Coated Galvanized
PSH - PVC Coated Stainless Steel
TH - Teflon Coated Stainless Steel

ARMOR LENGTH IN INCHES

LEAD WIRE INSULATION

TT - Teflon
GG - Fiberglass

LEAD LENGTH IN INCHES

MAX. TEMP. RANGE

362° NO CODE
962° CODE HT**

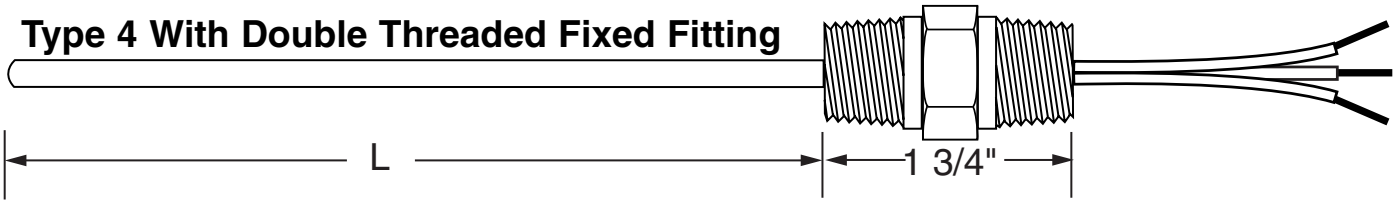
For Dual Sensors Designate As 2 + Sensor Code. EX: Dual 100 OHM Platinum = 2P

* NOTE: For Smaller Diameter Sensors, Consult TMS.

** NOTE: Sensors with Code "HT" will be provided with Fiberglass Leads.
Sensors with No Code (362°F) will be provided with Teflon Lead unless otherwise specified.

RTD SENSOR - TYPE 4

Type 4 With Double Threaded Fixed Fitting



ORDER EXAMPLE---------- 4 - 2P - 3 - 4 - 12 - R - 6 - TEMP

DESIGN TYPE

SENSOR TYPE

P - 100 OHM Platinum
Q - 200 OHM Platinum
R - 500 OHM Platinum
S - 1000 OHM Platinum
T - 100 OHM Nickel
U - 120 OHM Nickel
V - 10 OHM Copper
W - 100 OHM Copper
X - Other

NO. OF WIRES

2,3,4
FOR DUAL 4,6,8

SHEATH DIAMETER*

2 - 1/8" (.125)
3 - 3/16" (.188)
4 - 1/4" (.250)
5 - 5/16" (.313)

SHEATH LENGTH IN INCHES

SHEATH MATERIAL

P - 304SS
R - 316SS
Q - 310SS
J - INCONEL 600
X - OTHER

LEAD LENGTH IN INCHES

MAX. TEMP. RANGE

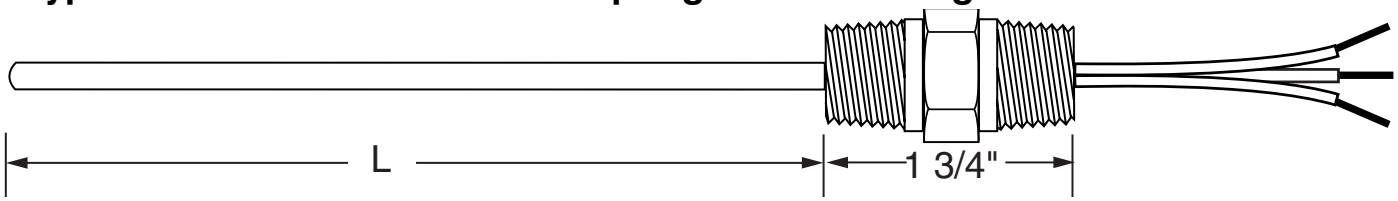
362° NO CODE
962° CODE HT**

For Dual Sensors Designate As 2 + Sensor Code.
EX: Dual 100 OHM Platinum = 2P

* NOTE: For Smaller Diameter Sensors, Consult TMS.
** NOTE: Sensors with Code "HT" will be provided with Fiberglass Leads.
Sensors with No Code (362°F) will be provided with Teflon Lead unless otherwise specified.

RTD SENSOR - TYPE S4

Type S4 With Double Threaded Spring Loaded Fitting



ORDER EXAMPLE---------- 4 - 2P - 3 - 4 - 12 - R - 6 - TEMP

DESIGN TYPE

SENSOR TYPE

P - 100 OHM Platinum
Q - 200 OHM Platinum
R - 500 OHM Platinum
S - 1000 OHM Platinum

T - 100 OHM Nickel
U - 120 OHM Nickel
V - 10 OHM Copper
W - 100 OHM Copper
X - Other

NO. OF WIRES

2,3,4
FOR DUAL 4,6,8

SHEATH DIAMETER*

2 - 1/8" (.125)
3 - 3/16" (.188)
4 - 1/4" (.250)
5 - 5/16" (.313)

SHEATH LENGTH IN INCHES

SHEATH MATERIAL

P - 304SS
R - 316SS
Q - 310SS

J - INCONEL 600
X - OTHER

LEAD LENGTH IN INCHES

MAX. TEMP. RANGE

362° NO CODE
962° CODE HT**

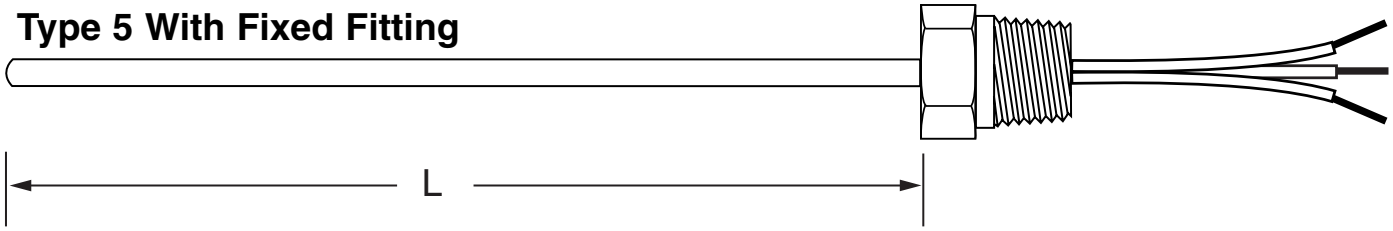
For Dual Sensors Designate As 2 + Sensor Code.
EX: Dual 100 OHM Platinum = 2P

* NOTE: For Smaller Diameter Sensors, Consult TMS.

** NOTE: Sensors with Code "HT" will be provided with Fiberglass Leads.
Sensors with No Code (362°F) will be provided with Teflon Lead unless otherwise specified.

RTD SENSOR - TYPE 5

Type 5 With Fixed Fitting



ORDER EXAMPLE---------- 5 - 2P - 3 - 4 - 12 - R - 6 - TEMP

DESIGN TYPE

SENSOR TYPE

P - 100 OHM Platinum
Q - 200 OHM Platinum
R - 500 OHM Platinum
S - 1000 OHM Platinum

T - 100 OHM Nickel
U - 120 OHM Nickel
V - 10 OHM Copper
W - 100 OHM Copper
X - Other

NO. OF WIRES

2,3,4
FOR DUAL 4,6,8

SHEATH DIAMETER*

2 - 1/8" (.125)
3 - 3/16" (.188)
4 - 1/4" (.250)
5 - 5/16" (.313)

SHEATH LENGTH IN INCHES

SHEATH MATERIAL

P - 304SS
R - 316SS
Q - 310SS

J - INCONEL 600
X - OTHER

LEAD LENGTH IN INCHES

MAX. TEMP. RANGE

362° NO CODE
962° CODE HT**

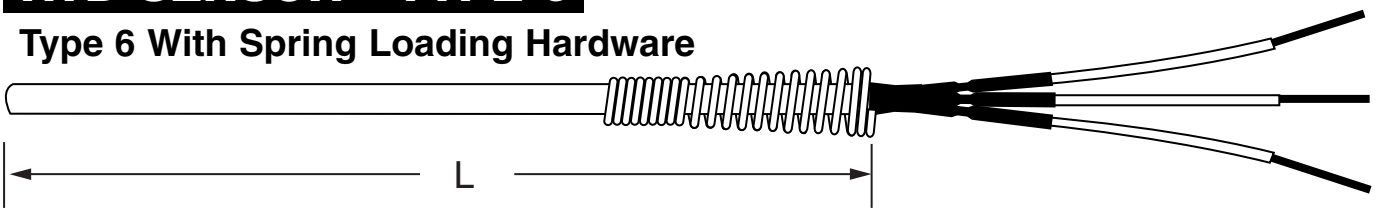
For Dual Sensors Designate As 2 + Sensor Code.
EX: Dual 100 OHM Platinum = 2P

* NOTE: For Smaller Diameter Sensors, Consult TMS.

** NOTE: Sensors with Code "HT" will be provided with Fiberglass Leads.
Sensors with No Code (362°F) will be provided with Teflon Lead unless otherwise specified.

RTD SENSOR - TYPE 6

Type 6 With Spring Loading Hardware



ORDER EXAMPLE---------- 6 - 2P - 6 - 4 - 12 - R - 6 - TEMP

DESIGN TYPE

SENSOR TYPE

P - 100 OHM Platinum
Q - 200 OHM Platinum
R - 500 OHM Platinum
S - 1000 OHM Platinum
T - 100 OHM Nickel
U - 120 OHM Nickel
V - 10 OHM Copper
W - 100 OHM Copper
X - Other

NO. OF WIRES

2,3,4
FOR DUAL 4,6,8

SHEATH DIAMETER*

2 - 1/8" (.125)
3 - 3/16" (.188)
4 - 1/4" (.250)
5 - 5/16" (.313)

SHEATH LENGTH IN INCHES

SHEATH MATERIAL

P - 304SS
R - 316SS
Q - 310SS
J - INCONEL 600
X - OTHER

LEAD LENGTH IN INCHES

MAX. TEMP. RANGE

362° NO CODE
962° CODE HT**

For Dual Sensors Desginate As 2 + Sensor Code.
EX: Dual 100 OHM Platinum = 2P

* NOTE: For Smaller Diameter Sensors, Consult TMS.

** NOTE: Sensors with Code "HT" will be provided with Fiberglass Leads.
Sensors with No Code (362°F) will be provided with Teflon Lead unless otherwise specified.

RTD TECHNICAL DATA

TWO LEAD VS. THREE LEAD ELEMENTS.

Measurement of temperature with a resistance temperature detector is a matter of measuring resistance. Unbalanced Wheatstone bridges are invariably used to measure the resistance.

In a resistance temperature detector, the sensing element is usually a small diameter wire, processed in such a manner so that its' resistance will change in a known and repeatable manner relative to temperature. When measuring resistance of the sensing element, all external factors must be minimized or compensated for, in order to obtain an accurate reading. A major cause of error can be the resistance of the leadwires, especially in two lead designs. The resistance of the leadwires is in series with the sensing element, so the readout is the sum of the resistance of the sensing element and leadwires.

Two lead connections are possible when the sensing element has a high resistance and the leadwires have a low resistance.

The leadwire resistance in RTD elements can be high, and must be compensated for in most applications. Compensation for leadwire resistance is possible if resistance temperature detectors are specified as three lead constructions.

Three lead connections are recommended for resistance temperature detectors having low sensing element resistance, where small lead wire resistance can have a large effect on readout accuracy.

APPLICATION GUIDE

EFFECT OF LEADWIRE ON RTD ACCURACY:

The majority of RTD sensor applications standardize on three or four leadwire systems. The difference between the two constructions is accuracy.

Most manufacturers will specify accuracy as 0.1% or a similar figure. This percentage refers to how tightly the RTD bulb is calibrated at one temperature and does not reflect the total sensor accuracy after leadwire is attached to the element.

Since a RTD is a resistance type sensor, any resistance in the extension wire between the RTD and control instrument will add to the readings. This added resistance is not constant because copper in leadwires change resistance with changing temperature. Errors may be nearly canceled by using a three wire construction.

LEADWIRE COMPENSATION:

Because an RTD is a resistance device, any resistance in the leadwires between the sensor and the instrument will add resistance to the circuit and alter the readings. Compensating for this extra resistance with adjustments at the instrument may be possible. Variations in ambient temperature alter copper leadwire resistance so this only works when leadwires are held at a constant temperature.

To approximate the error in a uncompensated sensor circuit, multiply the length (in feet) of both extension leads by the approximate value of the gauge wire used. Divide it by the sensitivity of the element to obtain an error value in degrees C. For example, assume a 100 ohm platinum element with 0.0385 TCR and 24 AWG leads, 150 ft. long:

Total Resistance = 300 ft. X 0.0262 ohms/ft. = 7.86 ohms
Approximate Error = 7.86 ohms/(0.385 ohm/deg. C) = 20.42 deg. C.

LEADWIRE AWG.	OHMS/FT @ 25°C	BASE RESISTANCE	SENSITIVITY
20 AWG	0.0103	.03926	0.392
22 AWG	0.0165	.00391	0.391
24 AWG	0.0262	.00385	0.385

RTD ACCURACY:

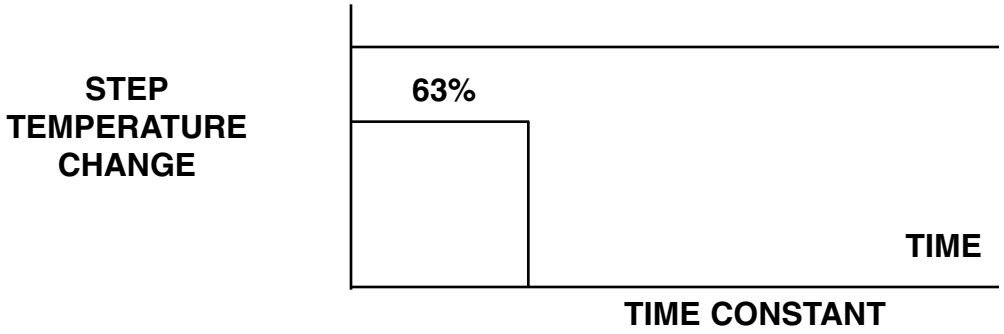
RTD ACCURACY - TIME CONSTANT (THERMAL RESPONSE)

An RTD sensing element like any other thermometer, senses its own temperature. Since you're actually interested in the temperature of the surrounding medium, accuracy depends on the ability of the RTD to conduct heat from its outer sheath to the element wire.

Several factors come into play. The most commonly noted is time constant (Thermal Response Time). What is Time Constant?

TIME CONSTANT

Time Constant or Thermal Response Time, is an expression of how quickly a sensor, in this case an RTD, responds to temperature changes. As expressed here, time response is defined as how long it takes a sensor to reach 63.2% of a step temperature change (Figure 1).



TIME CONSTANT

Response is a function of the mass of the sensor and its efficiency in transferring heat from its outer surfaces to the wire sensing element. A rapid time response is essential for accuracy in a system with sharp temperature changes. Time response varies with the probe's physical size and actual element mass.

Response characteristics can be altered by changes in element sizes, sheath diameter, wall thickness, and special packaging techniques. One common alteration is to manufacture a probe with copper tip to improve thermal sensitivity.

The bottom line is that you can often improve performance with careful design and material selection, but more often than not, the standard probe provides response characteristics to meet the vast majority of industry applications.

INTERCHANGEABILITY - AN APPLICATION AID

Interchangeability is a common cited factor of RTD accuracy. It tells how closely the sensing element of a RTD follows its nominal resistance/temperature curve, and the maximum variation that should exist in the readings of identical thermometers, mounted side by side under identical conditions.

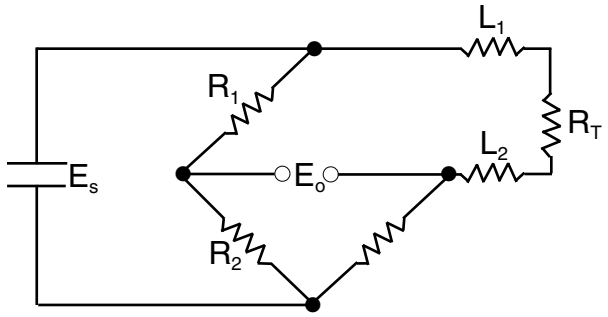
Interchangeability consists of both a tolerance at one reference temperature, usually 0 Deg. C, and a Tolerance of the slope, or temperature coefficient of resistance (TCR). For example, the standard German specification is DIN43760. A class "B" resistor requires the Ro to be 100 +/- .12 OHM, with a TCR of .00385 +/- .000012 OHM/OHM Deg. C. Because the slope may vary slightly, the tightest conformity to the nominal curve is at 0 Deg. C. For example tolerance is +/- .3 Deg. C at 0 Deg. C but +/- 3.8 Deg. C at 700 Deg. C.

Even a slight deviation in the TCR will cause a significant error to result at elevated temperature, thus, it is important for the user to specify the TCR when ordering RTD probes. Often users request the manufacturer's standard 100 OHM probes, when in fact manufacturers are not all working from the same standard or TCR.

Today U.S. industry is leaning toward the DIN 43760 standard with a TCR of .00385/OHM/OHM/C. However, until this standard is adopted by the governing agencies, manufacturers produce resistors (RTD'S) to several different TCRs.

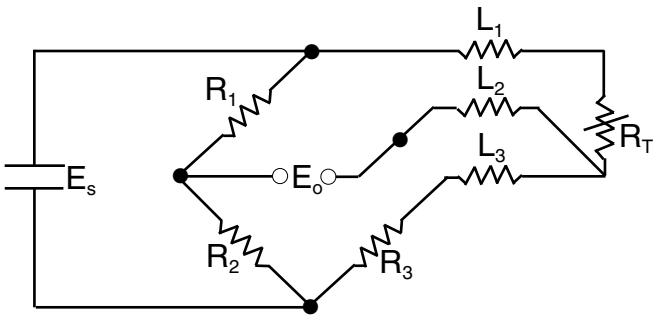
Figure 1 shows a 2 lead RTD connected to a typical Wheatstone Bridge Circuit. Es is the supply voltage; Eo is the output voltage; R1, R2, R3 are fixed resistors; and Rt is the RTD. In this circuit, lead resistances L1 and L2 add directly to RT.

FIGURE 1
2 WIRE
CIRCUIT



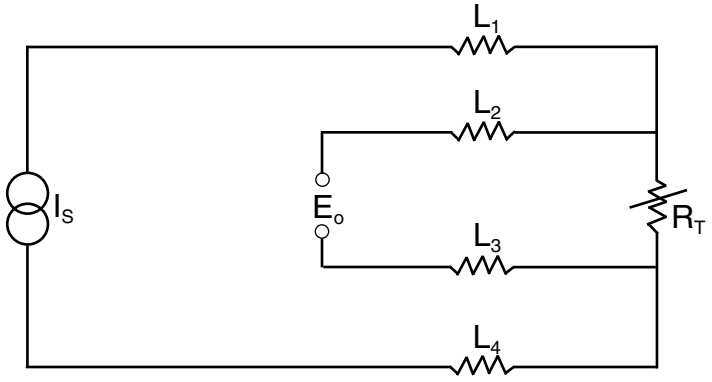
In the 3-wire circuit shown in figure 2, the identical measuring current flows through L1 and L2, canceling their resistance, since they're in two separate arms of the bridge. L3 connected to Eo is used only as a potential lead; no current flows through it when the bridge is balanced. This method of leadwire compensation depends on close matching of the resistance in L1 and L2 and high impedance at Eo, since any current flow in L3 will cause errors.

FIGURE 2
3 WIRE
CIRCUIT



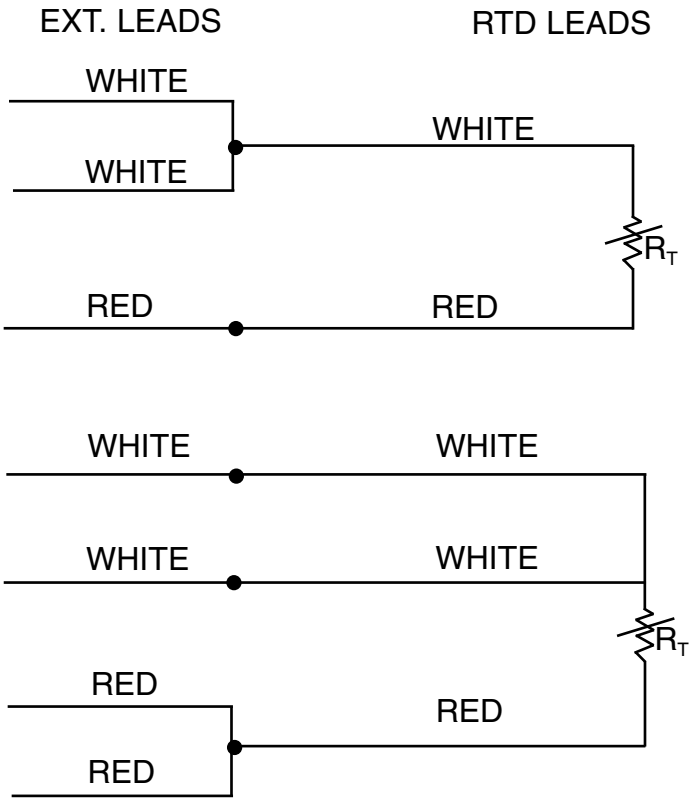
Four wire circuits offer the ultimate performance over extreme distances, or where small errors such as contact resistance becomes significant. Although many laboratory systems employ resistive networks for 4 wire compensation, the most common industrial circuit drives a constant current through the leads, and measures voltage drop across the remaining two (see Figure 3). Assuming that input impedance prevents current flow in L2 and L3, the only significant source of error is variation in the measuring current.

FIGURE 2
4 WIRE
CIRCUIT



If necessary, you can connect a 2 wire RTD to a 3 wire circuit or a 3 wire RTD to a 4 wire circuit. Just attach the extra extension wires to the ends of the RTD leads, as shown in Figure 4. As long as these connections are close to the sensing element, as in a connection head, errors should be negligible..

FIGURE 4 ADDING EXTRA LEADS



TMS RTD sensors are manufactured from elements that are in conformance with DIN 43760, JIS C 1604 and IEC 751 standards.

DIN 43760 specifies resistance curves and tolerances for platinum and nickel RTD elements. Platinum elements measure 100 ohms at 0 degrees C and have a TCR of .00385 ohms/ohms C. DIN 43760 specifies two tolerances. These tolerances are:

Class A: +/- .06% at 0 degrees C.
Class B: +/- .12% at 0 degrees C.

IEC 751 specifies for the same 100 ohm platinum curve and tolerances as DIN 43760 but includes additional specifications for design and testing of specific thermometers.

JIS C 1604 specifies 100 ohm .00385 platinum thermometers in accordance with IEC 751 but also makes provisions for TCR .003916.