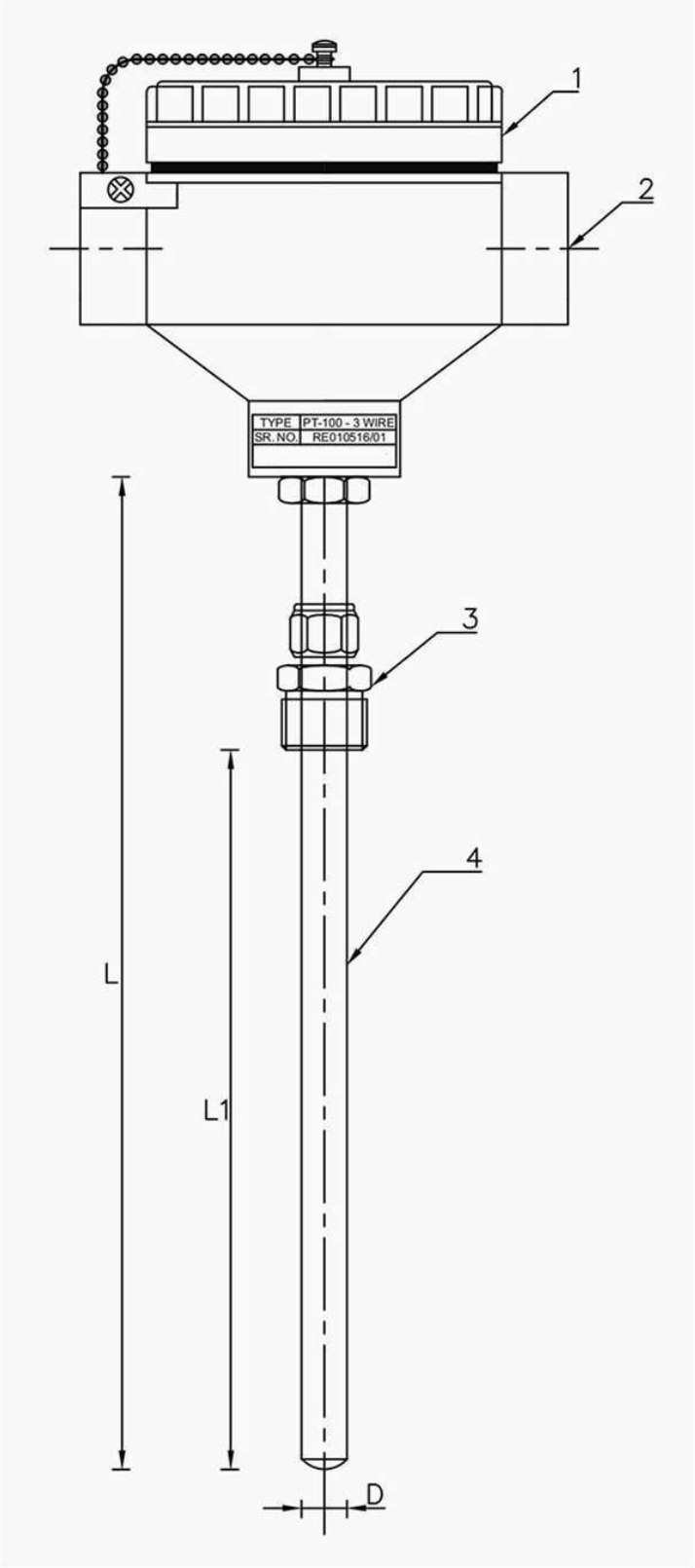
Resistance Temperature Detectors (RTDs)

Specifications

Element	PT-100, PT-200, PT-500, PT-1000
Configuration :	Simplex (Two/ Three/ Four wire) Duplex (Four/ Six/ Eight wire) Triplex on Request
Temperature Range	-200’ C up to 400’ C -200’ C up to 600’ C
Sheath OD	2 mm, 3 mm, 4 mm, 4.7 mm, 5 mm, 6 mm, 8 mm, 10 mm Others on Request
Sheath Material	SS316 as standard (Other on Request)
Accuracy	DIN Class-B, Class-A (Other on Request)
Insulation	MgO flled, Mineral Compact MgO (MI)
Open End	Enclosure/ Extension Cable / Quick connect – disconnect plug and jack / Spring loaded ceramic terminal block
Enclosure	Die Cast Aluminum/ SS304/ SS316, single or double entry with 3/4” ET(F) cable entry as standard, 1/2” NPT(F) for well or nipple
Protection	Weatherproof to IP-65, IP-67 Flameproof to Gr. IIA, IIB Flameproof to IIC ATEX certified CE Marked
Process Connection	1/4” to 3/4” BSP/NPT (M) Welded or Compression Fittings, Adjustable Flange, Triclover Connections, Nipple or Nipple-Union-Nipple Extension
Extension Cable Insulation	PTFE/PTFE PTFE/PTFE/SS Braided PTFE/ PTFE/ Silicon PTFE/ PTFE/ Shield/ PTFE Fiber / Fiber/ SS Braided
Optional Accessories	Head Mounted Temperature Transmitter Various Cable Glands Thermowell



1. Enclosure
2. Cable Entry
3. Process Connection
4. Sheath

L. Sheath Length Below Head

L1. Sheath Length Below Thread

D. Sheath Diameter

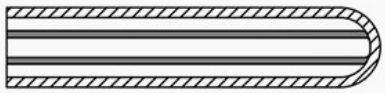
Thermocouples

Thermocouples contain two electrical conductors made of different materials which are connected at one end. The end of the conductors which will be exposed to the process temperature is called the measurement junction. The point at which the thermocouple conductors end (usually where the conductors connect to the measurement device) is called the reference junction. When the measurement and reference junctions of a thermocouple are at different temperatures, a millivolt potential is formed within the conductors. Knowing the type of thermocouple used, the magnitude of the millivolt potential within the Mineral Insulated Thermocouples, and the temperature of the reference junction allows the user to determine the temperature at the measurement junction. The millivolt potential that is created in the thermocouple conductors differs depending on the materials used. Some materials make better **High Temperature Thermocouples** than other because the millivolt potentials created by these materials are more repeatable and well established. These thermocouples have been given specific type designations such as Type E, J, K, N, T, B, R, and S.

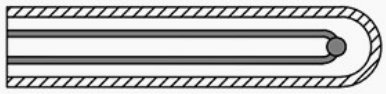
Thermocouple Types :

Type	Material Composition		Temperature Range	EMF
	positive (+)	negative (-)		
T	Copper	Constantan	-270°C to +400°C	-6.2 to 20.87 mV
E	Chromel	Constantan	-270°C to +1000°C	-9.8 to 76.37 mV
J	Iron	Constantan	-210°C to +760°C	-8.09 to 69.55 mV
K	Chromel	Alumel	-270°C to +1370°C	-6.4 to 54.88 mV
R	Pt-13% Rh	Platinum	-50°C to +1760°C	0.2 to 21.10 mV
B	Pt30% Rhodium	Pt 6% Rhodium	0°C to + 2000°C	0.0 to 13.82 mV
S	Platinum/10% Rhodium	Platinum	-50°C to +1750°C	-0.23 to 18.69 mV
N	Nicrosil	Nisil	-270°C to 1300°C	-4.34 to 47.51 mV

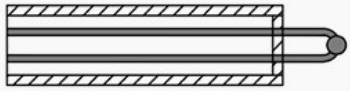
Thermocouple Junction Types :



A **grounded junction** is recommended for the measurement of static or flowing corrosive gas and liquid temperatures and for high-pressure applications. Grounded thermocouples have a very good response time because the thermocouple is making direct contact with the sheath, allowing heat to transfer easily. However they are much more susceptible to electrical noise and ground loops.



An **ungrountded junction** is recommended for measurements in corrosive environments where it is desirable to have the thermocouple electronically isolated from and shielded by the sheath. Ungrounded thermocouples offer better resistance to electrical noise and ground loops.



An **exposed junction** is recommended for the measurement gas temperatures where fast response time is required. The response time is very quick, but exposed thermocouple wires are more prone to corrosion and degradation.

Thermocouple Accuracy :

Type	**Limits of Error (Whichever is Greater)**	
	Standard	**Special**
K	± 2.2 ˚C or ±0.75%	±1.1˚C or ±0.4%
T	± 1.0˚C or ±0.75%	± 0.5˚C or ±0.4%
J	± 2.2 ˚C or ±0.75%	± 1.1˚C or ±0.4%
N	± 2.2˚C or ±0.75%	± 1.1˚C or ±0.4%
E	± 1.7˚C or ±0.50%	± 1.0˚C or ±0.4%
S	± 1.5˚C or ±0.25%	± 0.6˚C or ±0.1%
R	± 1.5˚C or ±0.25%	± 0.6˚C or ±0.1%