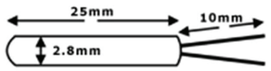
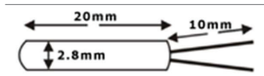
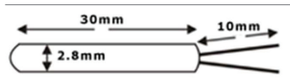
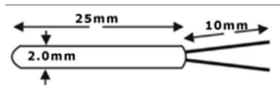
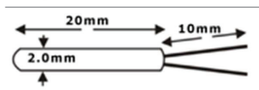
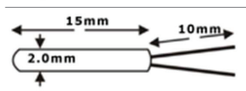
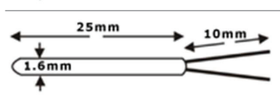
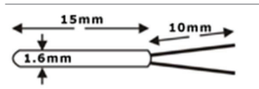
Technical specification for wire wound RTD

	Model : P-302510-S/D-DIN/JIS S = Simplex D = Duplex Lead dia. = 0.3mm Lead Material = Pt-Ni/ Pt
	Model : P-303010-S/D-DIN/JIS S = Simplex D = Duplex Lead dia. = 0.3mm Lead Material = Pt-Ni /Pt
	Model : P-302510-S/D-DIN/JIS S = Simplex D = Duplex Lead dia. = 0.3mm Lead Material = Pt-Ni /Pt
	Model : P-202510-S/D-DIN/JIS S = Simplex D = Duplex Lead dia. = 0.25mm Lead Material = Pt-Ni /Pt
	Model : P-202010-S/D-DIN/JIS S = Simplex D = Duplex Lead dia. = 0.25mm Lead Material = Pt-Ni /Pt
	Model : P-202010-S/D-DIN/JIS S = Simplex D = Duplex Lead dia. = 0.25mm Lead Material = Pt-Ni /Pt
	Model : P-152510-DIN/JIS S=Simplex Lead dia. = 0.25mm Lead Material = Pt-Ni/Pt
	Model : P-152510-DIN/JIS S=Simplex Lead dia. = 0.25mm Lead Material = Pt-Ni /Pt
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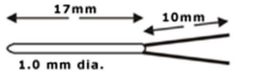	Model : P-152510-DIN/JIS S=Simplex Lead dia. = 0.20 mm Lead Material = Pt
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Notes :

- Tolerance in element dia. = +/-0.15 mm
- Tolerance in lead length = +/-1.5 mm
- Tolerance in element length is +/1.5mm
- All elements are available with accuracy as per IEC 60751.
- Lead length of 15 mm available instead of 10 mm
- Customized dimensions available
- Different windings like Pt50, Pt100, Pt200, Pt46 etc. Available
- For further information, please contact us.

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WIRE WOUND RTD ELEMENTS

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ISO 14001
ISO 45001

WIRE WOUND RTD ELEMENTS

General description for RTD elements

Temperature is one of the important basic or fundamental quantity of a matter and it defines the thermal energy of the matter. It is measured in various units like °C, °F, and °K. All these units are quite well defined by International Temperature scale ITS 90. Among various methods of temperature measurements, thermocouples, resistance thermometers and thermistors are most popular. The reason being they provide electrical signals, which can be connected to, sophisticated indicating, controlling and recording instruments. Over the range of –200 deg c to +962 deg C, accepted standards is the Standard PRT i.e. Platinum Resistance Thermometers. The basic principle of resistance thermometry is that the resistively of metal depends upon it's temperature. It is an absolute method of measurement (As compared to thermocouple which measures temperature difference) For a particular metal, a curve can be obtained for resistance versus temperature. The base metal used in resistance thermometry are Platinum, Copper and Nickel. Since early days, resistance thermometry has gone to considerable changes, and they are now extensively used in industries. At temperature below 650 deg C, the industrial resistance thermometer is now more accurate and reliable than any other sensors. The increase in use of microcontroller based linearised instruments increases the choice of RTDs.

Among all the base metals, Platinum is now a days the best choice in the industries. Platinum being a noble metal retains its characteristics for longer time. For wide temperature range Platinum Resistance thermometer follows the equation as defined below,

For the range –200 °C to 0 °C:

$Rt = R0 [1 + At + Bt^2 + C(t – 100 °C) t^3]$

For the range of 0 °C to 850 °C:

$Rt = Ro(1+At + Bt^2)$

Where Rt = Resistance at temperature t

Ro = Resistance at 0 °C temperature

A and B are alpha and beta values of Platinum resistors.

Various construction of RTD elements

RTD elements are available in three type of construction

- Thin film type
- Thick film type
- Wire wound RTD element

Film technology

Thick film is produced by spreading Platinum paste through a silk screen onto a ceramic substrate. Thin film is produced by evaporation of metal onto a substrate and then by suitably itching with LASER technology

The basic advantages of both types are they are mass produced elements, they are cheaper as well as they can work in environment. Where extreme vibration is presence

The disadvantage of these elements are

- The film is covered rigidly by glass layer and so the Platinum is not free to expand. The result is they can not maintain characteristics specially at higher temperature
- The film contains very litile metal and hence there are more chance of contamination from the impurities of the glass covering.
- Control of homogenous of metal is difficult as compared to wire used in wire wound elements.
- The unit have very litile size and mass is also small. Hence they are subject to self heating error when sensing current is pass through it.

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WIRE WOUND RTD ELEMENTS

Wire wound elements are basically a "handmade" product which involves lot of skilled Labour.

It is manufactured by placing a coil of thin wire (7 microns to 35 microns) into a ceramic insulator. The resistance of the coil is suitably adjusted to the ohms corresponding to that temperature. Ideally, this coil should be freely suspended for natural expansion and contraction. However, such construction is not immune to vibration and hence it is not adopted for industrial application. For industrial application, normally partially supported or fully supported construction is used which are quite immune to vibration. The extended leads are quite rugged as compared to the alpha wire and normally made from Pt base metal (for Platinum resistors). The choice of ceramic insulator is also very important as any impurities in the insulator may detoriate the characteristic of the alpha wire.

Techno offers wide range of wire wound RTD Elements.

These elements are manufactured in India under strict quality control.

Techno supplies these elements with tolerance value of Tolerance class W0.15 and Class W 0.3

Tolerance of Class W0.15 and Class W 0.3 are defined by following equation

for class W0.15 ;

Tolerance = ± (0.15 + 0.002(T))

for class W 0.3 ;

Tolerance = ± (0.3 + 0.005(T))

Where T = Temp in °C'

These elements are manufactured for use between –200 deg C' to +500 deg C' All these elements are supplied with Platinum leads or Platinum based metal leads of 10 mm length. For measuring tolerance, the measuring wires are connected to the lead at 5 mm from the closed end. Normally, 1mA sensing current is recommended for sensing purposes.

A 2.8 mm x30 mm element will have self heating characteristics of 0.01 per deg c/mW. In air, it increases about 30 times. With adequate support, the elements will withstand vibration level of 30g over the frequency range of 10 Hz to 30 Hz.

(Sensing Length at element)

S.L. = T.L. -3mm