



August 2007

What is an 'RTD'?

Historical August



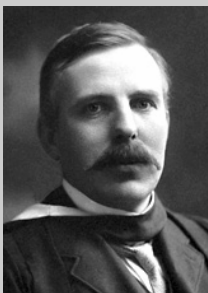
13th August 1961

The borders between East & West Berlin are sealed. Border guard Conrad Shuman (above) makes a break for the West just 2 days later.



16th August 1977

Elvis Presley is pronounced dead on arrival at the Baptist Memorial Hospital, Memphis Tennessee. He was 42 years old.



30th August 1871

Lord Ernest Rutherford, 1908 Nobel Prize winner for Chemistry born at Spring Grove (now Brightwater), Nelson, NZ.

The Pt-100

Of all ways to measure temperature, the Pt-100 Resistance Temperature Detector (RTD) is the most common standard method for temperatures up to around 400 deg C.

A Pt-100 is so named due to the fact that the element material is Platinum (Chemical Symbol 'Pt') and because at 0°C it provides an electrical resistance of 100 ohms.

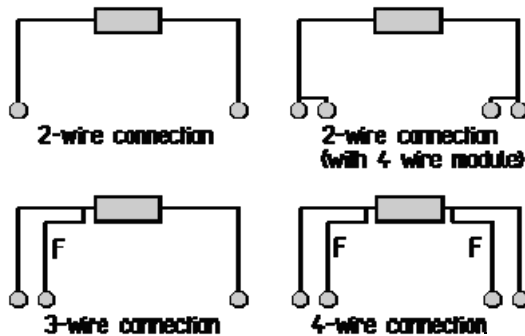
Pt-100 Classes & Bands

The reasons as to why you want to measure a temperature may have an influence on the specification of Pt-100 you chose. Different accuracies can be achieved due to the purity of the platinum material used in an element. The most common Pt-100's are:-

- ◆ Class A: ±0.06% (0.15°C)*
- ◆ Class B: ±0.12% (0.30°C)
- ◆ Band 4: ±0.05% (0.03°C)
- ◆ Band 5: ±0.03% (0.01°C)



R2D2: Not Just A Thermometer



2,3 & 4 wire RTD circuit connections

Connecting RTD's

Resistance varies with temperature. This is measured by passing a constant current through the resistance and measuring the voltage drop. The drop is given by Ohm's Law:-

$$V = I \times R$$

The smallest possible current should be used to avoid heating the element.



Intech MRH-SHP Pt-100 Probe

2, 3 or 4 wire?

Copper wire with a CSA of 0.5mm has a resistance of approx 0.17 ohms per metre. So, 10 metres of wire can add 3.4 ohms resistance to a loop (there are 2 wires in a loop) . This equates to a temperature increase of nearly 9 deg C. That's quite an error!

2-wire

In a 2 wire circuit this error can be removed by calibration by initially using a 100 ohm resistor rather than the sensor and adjusting the controller reading to zero deg C. This won't calibrate across the entire range but will remove the error due to the wiring circuit.

3-wire

To minimize the effects of lead resistances and their fluctuations with temperature, 3 wire circuits are normally used rather than 2 wire. An additional lead is attached to one terminal of the sensor creating two measuring circuits - one of which is used as a reference. As long as the three wires are identical, there is no need for lead compensation.

4-wire

The crème de la crème of RTD wiring. The measurement result is unaffected by either the lead resistances or temperature. Compensation is not necessary if the RTD is wired this way.

Intech Instruments Ltd
59 Mandeville Street
Riccarton
Christchurch 8011
New Zealand
Phone: +64 (3) 343 0646
Fax: +64 (3) 343 0649

Intech Instruments Ltd
209 Karamu Road North
Hastings
Phone: +64 (6) 876 0034
Fax: +64 (6) 876 0036
E-mail: sales@intech.co.nz
www.intech.co.nz



Intech products are used throughout the wine industry.



Intech: Found Worldwide.

For almost 25 years Intech Instruments have been operating throughout New Zealand, servicing a variety of industries. Our product range is made up of both our own high quality manufactured products plus a range of first class imported items.

Our core business is concerned with supervisory, monitoring and control – utilising hardware and software facilities to provide a host of solutions for end users.

Based in Christchurch, where we have both a sales and service operation, Intech Instruments also have offices in Auckland and Hawkes Bay.

With a combination of industrial experiences and technical skills, Intech are able to provide customers with the best possible solutions for a variety of applications.

Shimaden FP93



Shimaden: Popular For Good Reasons

Shimaden's FP93 is a controller that will run a set program of ramp and hold functions. 4 individual programs with 10 steps, 2 programs with 20 steps or a single program of 40 steps can be input into the controller.

Shimaden FP93 Features:-

- ◆ Large 20mm bright PV display
- ◆ IP66 front panel
- ◆ Optional RS232/485 communications
- ◆ FREE Shimaden Lite software
- ◆ Various additional options available

Intech Power Supplies

Providing your instruments with a quality power supply is crucial to their performance. Loop fluctuations should ideally be the result of the measuring device only. The Intech PSW series units provide ultra smooth power.

- ◆ Adjustable Output (5-30vdc)
- ◆ Extremely Low Noise
- ◆ Precision Regulation
- ◆ Highly Accurate (0.1%)
- ◆ Short Circuit Tolerant



Intech PSW: Ultra Smooth Power

Intech MicroScan

A complete Windows based SCADA software product, MicroScan meets many industrial, commercial and research facilities demands.

- ◆ Real Time Trends
- ◆ History & Search Screens
- ◆ Extremely Cost
- ◆ Encrypted Software

A very proficient SCADA system indeed.

