



Intech INSTRUMENTS LTD

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Temperature Measurement Using RTD's

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.

Classes & Bands

The reasons as to why you want to measure a temperature may influence the specification of which RTD you chose. Different accuracies can be achieved due to the purity of the platinum material used in an element. The most common Pt100 classes are:-

Tolerance Class	Applicable Range	Tolerance in °C	Tolerance @ 0°C	Tolerance @ 100 °C
Class A	-200 to +600°C	$\pm(0.15^\circ\text{C} + 0.0020 \times t)$	$\pm 0.15^\circ\text{C}$	$\pm 0.35^\circ\text{C}$
Class B	-200 to +600°C	$\pm(0.30^\circ\text{C} + 0.0050 \times t)$	$\pm 0.30^\circ\text{C}$	$\pm 0.80^\circ\text{C}$

RTD units are also classified in tolerance 'bands'. This refers to specific resistance errors measured at various temperature points. So, rather than a temperature error it is a resistance error. There are five tolerance bands from 0.1% to 0.01%.

2, 3 or 4 wire?

10m of 0.5mm CSA wire may add 3.4 ohms to a loop. This equates to a temperature increase of nearly 9 deg C. That's quite an error!

2-wire

2 wire errors can only be removed by calibration and do not account for resistance fluctuations due to temperature changes.

3-wire

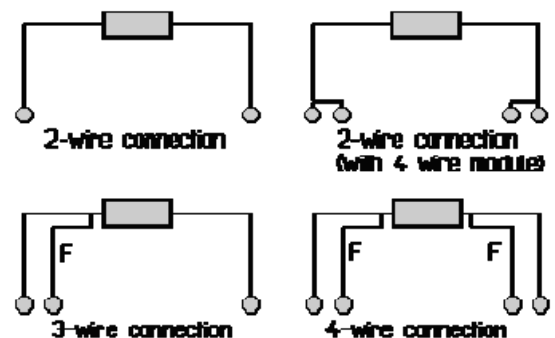
To minimise the effects of lead resistances and their fluctuations with temperature, 3 wire circuits are the preferred choice. An additional lead creates a 2nd reference circuit which is used compensate automatically for the errors.

4-wire

The crème de la crème of RTD wiring. The measurement result is unaffected by either the lead resistances or temperature as dual reference circuits are created by 2 additional lead wires. Compensation is not necessary if the RTD is wired this way.



KISS Rock band (not RTD Band)



11th May, 1977

Victor Matfield, Springbok Captain is born in Pietersburg (now Polokwane), Limpopo Province, South Africa.



14th May, 1796

Edward Jenner successfully inoculates 8 year old James Phipps against the deadly smallpox disease with cowpox pus obtained from milkmaid Sarah Nelmes.



May 28th, 1987

19 yr old West German Matthias Rust is arrested after he lands his Cessna aircraft on Red Square, Moscow.

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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 Power Supplies: Ultra Smooth

Intech MicroScan

A seasoned performer MicroScan offers end users a complete Windows based SCADA software product at a fraction of the cost to install some larger systems. MicroScan meets many industrial, commercial and research facilities demands.

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

With the facility to link to wireless monitoring transducers via Zigbee technology, MicroScan is well placed to oversee your monitoring needs for many years to come.

A very proficient SCADA system indeed.

Shimaden FP93



Shimaden FP93 unit.

A very capable unit, Shimaden's FP93 controller is equipped with an impressive range of ramp / dwell (hold) programs.

Four individual programs with 10 steps, 2 programs with 20 steps or a single program of 40 steps can be input into the controller.

- ◆ Large 20mm bright PV display
- ◆ IP66 front panel
- ◆ Optional RS232/485 communications
- ◆ FREE Shimaden Lite software
- ◆ Can also be used with MicroScan



Typical MicroScan Recorder Screen