



January 2008

Introduction to Thermocouples

Historical January



4th January 1967

Donald Campbell is killed on Lake Coniston whilst attempting to break the water speed record in his Jet powered craft, Bluebird K7.



25th January 1971

In Uganda, General Idi Amin seizes power from President Milton Obote. A brutal dictator, Amin ruled until fleeing into exile in 1979.



26 January 1925

Paul Leonard Newman; multiple award winning actor, born in Shaker Heights, Cleveland, Ohio.

What is thermocouple?

A thermocouple is a sensor that measures temperature. It consists of two different types of metals, joined together at one end. When the junction of the two metals is heated or cooled, a voltage is created that can be correlated back to the temperature.

Common thermocouples.

Thermocouple are available in a variety of guises using different metals or calibrations. Type-J & Type-K are commonplace in NZ though varieties T,E,N,S,R,B are also used within the industrial sector.

Type	Min Temp (Deg C)	Max Temp (Deg C)
K	-200	+1200
J	-40	+750
N	-200	+1200
R	-40	+1600
S	-40	+1600
B	+600	+1700
T	-200	+350
E	-200	+900

Thermocouple Junctions

Three types of junction exist:-



Grounded: The thermocouple is in contact with the metal sheath.

Pro: Fast response.

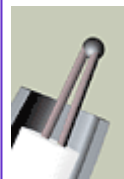
Con: Susceptible to Earth loops.



Ungrounded: The thermocouple is separated & insulated from the sheath.

Pro: Electrically isolated.

Con: Slower response.



Exposed: The thermocouple is open to the medium (usually air or gas).

Pro: Very fast response.

Con: Non isolated / gas use only.



Intech boiler probe (top) and standard MTL are both varieties of type K thermocouple probes.

Identifying thermocouples.

Although a variety thermocouples exist they are easily identified depending on the authority, institute or governing standardising organisation. The common colours are listed below.

Type	IEC Colour code	BS Colour code	ANSI Colour code
K			
J			
N			
R			Not defined.
S			Not defined.
B	No standard use copper wire	No standard use copper wire	Not defined.
T			
E			

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The Intech Difference

- ◆ New Zealand owned & operated
- ◆ Christchurch, Auckland, Hawkes Bay
- ◆ Service & sales facilities
- ◆ 25 years in the industry
- ◆ Experience you can rely on



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Intech 'DC - Frequency' & 'Frequency - DC' Transmitters

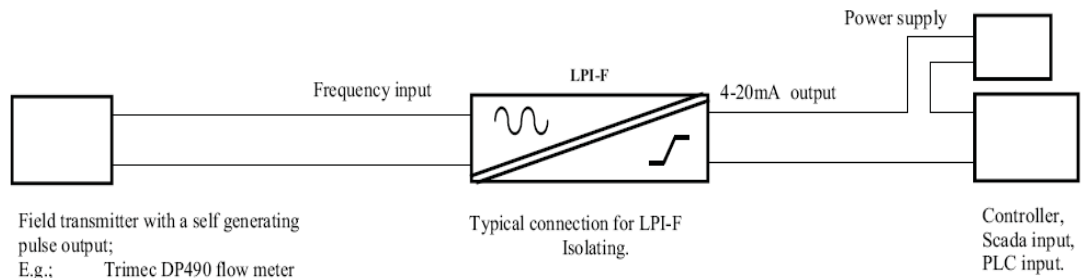


A familiar green box, but not all Intech green boxes are the same! If you need to interface with frequency or pulse signals, Intech LPI-F & TW series units are the choice:-

- ◆ Frequency / Pulse to 4-20mA (or visa versa)
- ◆ Designed for PLC input signals
- ◆ 0.1% accuracy
- ◆ LED Indication of loop current



4-20mA to Digital Input for PLC's



Typical Installation for LPI-F



Intech: Very Popular.

Trimec Flow Meters

Intech have stocked the Trimec range of flow meters for some time. Trimec offer a very good cost effective alternative to expensive Magnetic Flow units for many applications. Accurate, easy to use and flexible, Trimec have an excellent range to cover both safe area & hazardous area applications.



Trimec produce a host of controller & displays. Remote installation (left) or for local indication (above). Batch control or Rate totalising are common display functions.



Intech are heavily involved in the wine industry.