GENERALITIES ON Pt 100 Ω PROBES

PRINCIPLE

The measure rely on variable resistance of metalic wires with temperature. Materials most often used are platinum and nickel.

Platinum offers a large temperature scale and a very good linearity. His pureness and chemical inertia guarantee a remarquable stability of sensible elements

The relation between platinum resistance and temperature according norma CEI 751 follows :

Rt = Ro [1 + At + Bt2 + Ct2 (t - 100)]

Rt = Thermometer resistance at temperature t

Ro = Thermometer resistance at 0°C

t = Temperature in °C

A B C = coefficients détermined by calibration

C = at 0°C for positives temperatures

Industrial probes and boards are base on :

Ro = 100 Ohms

R 100°C = 138,5 Ohms

STANDARDS AND TOLERANCES

FRANCE	NFC 42330
GERMANY	DIN 43760
GREAT BRITAIN	BS 1904
INTERNATIONAL	CEI 751

acceptable tolérances in °C ± (0,15 + 0,002[t]) for class A

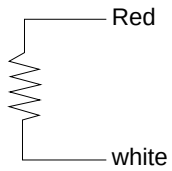
acceptable tolérances in°C ± (0,3 + 0,005[t]) for class B

[t] is temperature value in °C.

Temperature in °C	Acceptable tolerance for class A		class B	
	Ω	°C	Ω	°C
-200	±0,24	±0,55	±0,56	±1,3
-100	±0,14	±0,35	±0,32	±0,8
0	±0,06	±0,15	±0,12	±0,3
100	±0,13	±0,35	±0,30	±0,8
200	±0,20	±0,55	±0,48	±1,3
300	±0,27	±0,75	±0,64	±1,8
400	±0,33	±0,95	±0,79	±2,3
500	±0,38	±1,15	±1,06	±3,3
600	±0,43	±1,35	±1,06	±3,3
650	±0,46	±1,45	±1,13	±3,6
700			±1,17	±3,8
800			±1,28	±4,3
850			±1,34	±4,6

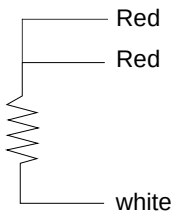
SETTINGS AND CONNECTIONS

Many connections of resistance probes.



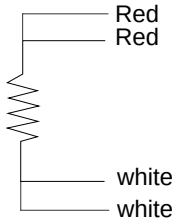
1 / 2 wires setting

The most simple but influenced by line resistance.



2 / 3 wires setting

Often used for industrial applications. This setting limits the effect of lines resistances



3 / 4 wires setting

The most accurate setting. It cancels all mistakes due to lines resistances and wires temperature variations.
Often used in laboratories.

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