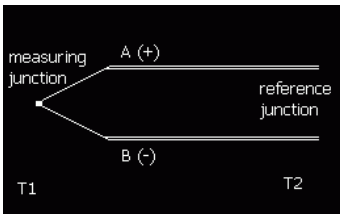
THERMOCOUPLE CABLES

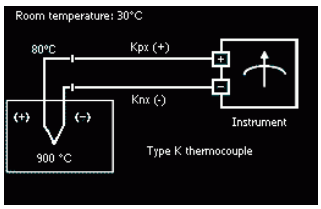
Thermoelectricity: When a metallic conductor is exposed to a difference of temperature between the two extremities, an electromotive force (emf) is generated by the temperature gradient, which causes a redistribution of the electrons through the conductor. The EMF value depends on the material and the temperature gradient.



Let's consider two materials, generically denominated A and B, exposed to the same difference of temperature between their extremities. In each one an electromotive force will result. The EMF value depends on the type of material and the temperature gradient. In case of a homogeneous material the EMF value depends solely on the difference of temperature between the extremities.

The phenomenon described above is fundamental to understand the thermoelectricity and its applications to measurement of temperature it's called See beck Effect, which is what creates the sensor known as thermocouple or thermoelectric couple. Elements A and B that make up a thermocouple are denominated Thermo elements. In the configuration of a thermocouple, the extremity at which the thermo elements are joined is called Measuring (or hot) Junction. If the temperature of the Reference (or cold) Junction, the other extremity, is fixed at 0°C, then the EMF value will depend solely on the temperature of the Measuring (or hot) Junction

Extension and compensating cables : Extension and compensating cables shall have temperature-EMF characteristics similar to the thermocouple with which they should be connected to transfer signals from the Measuring (or hot) Junction to the Reference (or cold) Junction.
Extension cables comprise conductors with the same nominal composition as the corresponding thermocouple; compensating cables comprise conductors with different nominal composition but same temperature – EMF characteristics as the corresponding thermocouple.



TYPE OF THERMOCOUPLE		THERMOCOUPLE MATERIALS		Temp. EMF at 100°C Corresponding to 0°C ref Junction [mv] & Tolerance	BRITISH BS:1843	AMERCIAN ANSI MC 96.1	GERMAN DIN 43170-4	INDIAN IS:8784
		Positive [+ive]	Negative [-ive]					
J [Iron / Constantan]		Extension Cable		5.268 ±2.2°C				
		Iron	Constantan [Cu-Nickel Alloy]					
K Ni-Chromel / Ni-Alumel	Kx	Extension Cable		4.095 ±2.2°C				
		Ni-Chromel	Ni-Alumel					
	Vx	Compensating Cables		4.095 ±3.0°C				
		Copper	[Cu-Nickel Alloy]					
E Chromel/Constantan		Extension Cable		6.317 ±2.2°C				
		Ni-Chromel	Constantan Or Kopel					
T Copper/Constantan		Extension Cable		4.277 ±2.2°C				
		Copper	Constantan					
R Platinum 13% Rhodium / Platinum		Compensating Cables		0.647 ±5.0°C				
		Copper	Cupronic [Cu-Nickel Alloy]					
S Platinum 10% Rhodium / Platinum		Compensating Cables		0.645 ±5.0°C				
		Copper	Cupronic [Cu-Nickel Alloy]					