THERMOCOUPLE REFERENCE GUIDE

			Limits of Error		
Type	**Material**	**Polarity**	**Range**	**Standard / Class 2**	**Special / Class 1**
J	Iron	+ve	0 to 760°C	2.2 °C or 0.75%	1.1 °C or 0.4%
	Constantan	-ve			
T	Copper	+ve	-200 to 0 °C 0 to 370 °C	1 °C or 1.5% 1 °C or 0.75%	0.5 °C or 0.8% 0.5 °C or 0.4%
	Constantan	-ve			
K	Chromel	+ve	-200 to 0 °C 0 to 1260 °C	2.2 °C or 2% 2.2 °C or 0.75%	1.1 °C or 0.4%
	Alumel	-ve			
E	Chromel	+ve	-200 to 0 °C 0 to 370 °C	1 °C or 1.5% 1 °C or 0.75%	0.5 °C or 0.8% 0.5 °C or 0.4%
	Constantan	-ve			
N	Nicrosil	+ve	0 to 1260 °C	2.2 °C or 0.75%	1.1 °C or 0.4%
	Nisil	-ve			
S	Platinum 10% Rhodium	+ve	0 to 1480 °C	1.5 °C or 2.5%	0.6 °C or 0.1%
	Platinum	-ve			
R	Platinum 13% Rhodium	+ve	0 to 1480 °C	1.5 °C or 2.5%	0.6 °C or 0.1%
	Platinum	-ve			
B	Platinum 30% Rhodium	+ve	870 to 1700 °C	0.50 %	0.25%
	Platinum 6% Rhodium	-ve			

Type J - Iron Constantan thermocouples are suitable for use in vacuum, oxidizing, reducing or inert atmospheres.

Type T – Copper-Constantan thermocouples are suitable for sub-zero temperatures with an upper temperature limit of 371°C and can be used in vacuum, oxidizing, reducing and inert atmospheres.

Type K – Chromel-Alumel thermocouples are suitable for continuous use in oxidizing or inert atmospheres. Oxidation resistance characteristics are better than those of other base metal thermocouples.

Type E – Chromel-constantan thermocouples are suitable for use up to 781 °C in oxidizing or inert atmospheres for largest wire size. The Type E thermocouples develop the highest E.M.F per degree of all commonly used thermocouples.

Type N – Nicrosi-Nisil thermocouples are suitable for use in oxidizing, inert or dry reducing atmospheres. Very accurate in high temperatures. Virtually the same E.M.F. and range as Type K.

Type S – Platinum 10% Rhodium – Platinum thermocouples are suitable for continuous use in oxidizing or inert atmospheres at temperatures up to 1482 °C

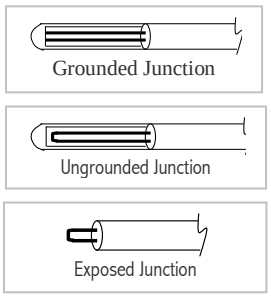
Type R – Platinum 13% Rhodium-Platinum thermocouples are suitable for continuous use in oxidizing or inert atmospheres at temperatures up to 1482 °C

Type B – Platinum 30% Rhodium – Platinum 6%Rhodium thermocouples re suitable for continuous use in oxidizing or inert atmospheres and short-term use in vacuum atmospheres at temperatures up to 1705 °C

THERMOCOUPLE SIZE AND RESPONSE TIME (SECONDS)			
Sensor Diameter (INCH / MM)	**Conductor Size AWG**	**Response time of Junction**	
		Grounded	**Ungrounded**
1/25” / 1.0	33	0.1	0.3
1/16” / 1.6	29	0.2	0.5
1/8” / 3.2	23	0.6	1.5
1/8” / 3.2 Dual	25	0.6	1.5
3/16” / 4.8	19	1.1	2.2
3/16” / 4.8 Dual	21	1.1	2.2
1/4“ / 6.35	17	2.0	4.5
1/4“ / 6.35 Dual	19	2.0	4.5
3/8“ / 9.5	14	2.9	8.2
3/8“ / 9.5 Dual	15	2.9	8.2

Response time is the typical required time to indicate 63.2% of a temperature change from room temperature to boiling water

MEASURING JUNCTION



RECOMMENDED TEMPERATURE LIMITS FOR METAL SHEATH THERMOCOUPLES						
	INCH / MM					
CALIBRATION	1/25” / 1.0	1/16” / 1.6	1/8” / 3.2	3/16” / 4.8	1/4“ / 6.35	3/8“ / 9.5
J	260 °C	440 °C	520 °C	620 °C	720 °C	720 °C
T	260 °C	260 °C	315 °C	370 °C	370 °C	370 °C
K/N	700 °C	920 °C	1070 °C	1150 °C	1150 °C	1150 °C
E	300 °C	510 °C	650 °C	730 °C	820 °C	820 °C

1-TCREFGUIDE-1604–01

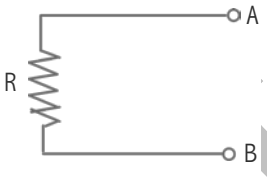
RTD - RESISTANCE TEMPERATURE DECTOR
REFERENCE GUIDE

Tolerance of Resistance Element to Temperature and Applicable Standard

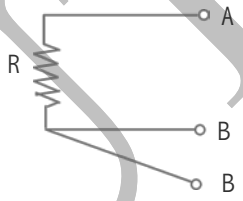
Resistance vs Temperature Tables According to DIN EN 60751 Alpha value = 0.00385 per ITS 90
Class B : dt = +/-(0.3 + 0.005 . [t])°C
Class A : dt = +/-(0.15 +0.002 . [t])°C
1/3 Din : Dt = +/-(0.1 + 0.0017.[t])°C
1/10 Din : dt = +/-[1/10*(0.3 + 0.005 . [t])]°C

[t] denote operating temperature

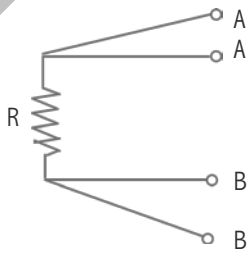
Wiring Method of Resistance Thermometer



2 WIRE



3 WIRE
commonly use in



4 WIRE