

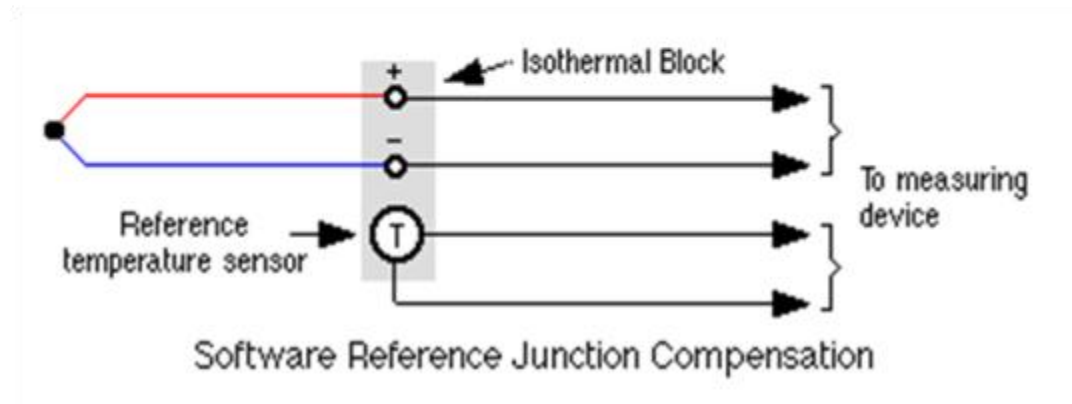
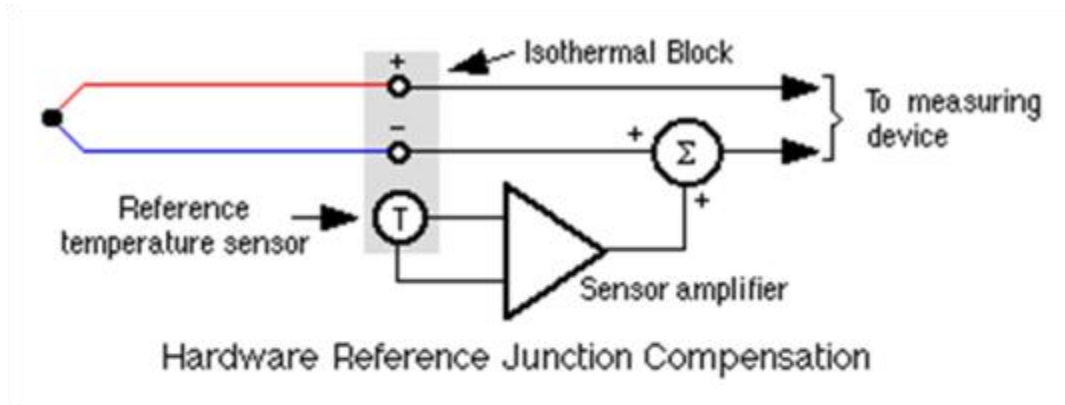
Temperature Reference units



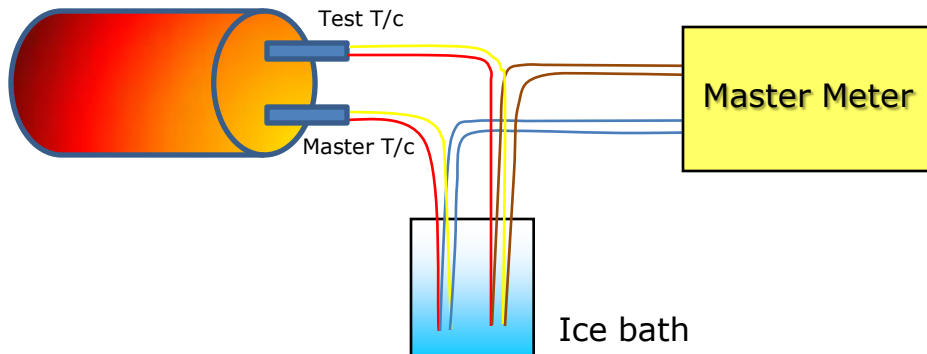
Why Reference Junction ?

- Thermocouple output is dependent of temperature of hot junction and temperature of cold junction.
- The Cold junction temperature needs to be known to get the hot junction temperature.
- To reduce the uncertainty of cold junction measurement Reference junction boxes are used.
- A reference junction box terminates the thermocouple cold end at a **known and constant** temperature. This can be 0 deg or 60 Deg C, as per user requirement.
- The EMF of the reference junction is fixed and is added on to the output of the thermocouple.

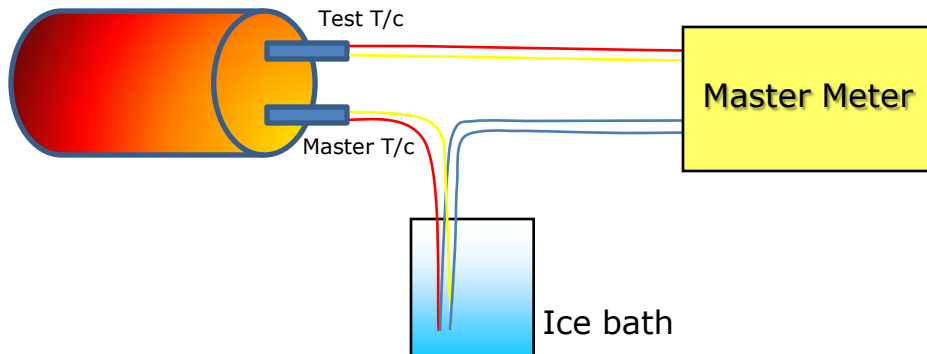
Practical CJC



Effect in reading



Test 1 : Test T/c with Cold junction compensation



Test 2 : Test T/c without Cold junction compensation

With 0 reference

Sr. No.	Master Reading (R type)		Test Reading (S type)		Diff.
	mV	Temp.	mV	Temp.	
1	13.19	1197.23	11.919	1197.37	0.14
2	13.19	1197.28	11.92	1197.46	0.18
3	13.191	1197.35	11.917	1197.28	-0.07
4	13.191	1197.32	11.917	1197.3	-0.02
5	13.192	1197.41	11.918	1197.36	-0.05
6	13.192	1197.45	11.917	1197.39	-0.06
7	13.191	1197.38	11.919	1197.42	0.04
8	13.191	1197.35	11.92	1197.48	0.13
9	13.192	1197.43	11.919	1197.45	0.02
10	13.192	1197.46	11.919	1197.4	-0.06
Average	13.1912	1197.366	11.9185	1197.391	0.025

Master with 0 reference & Test without 0 Reference Internal mode
RJ = 26.52 Deg C

Sr. No.	Master Reading (R type)		Test Reading (S type)		Diff.
	mV	Temp.	mV	Temp.	
1	13.188	1197.11	11.766	1197.56	0.45
2	13.188	1197.13	11.768	1197.66	0.53
3	13.189	1197.2	11.77	1197.85	0.65
4	13.189	1197.23	11.771	1197.9	0.67
5	13.19	1197.31	11.773	1198.02	0.71
6	13.191	1197.38	11.77	1197.9	0.52
7	13.192	1197.42	11.772	1197.95	0.53
8	13.191	1197.35	11.769	1197.8	0.45
9	13.19	1197.3	11.769	1197.82	0.52
10	13.191	1197.33	11.771	1197.92	0.59
Average	13.1899	1197.276	11.7699	1197.838	0.562

The test and master are already calibrated from accredited lab with deviation at 1200 deg as 0.1 deg C between them.

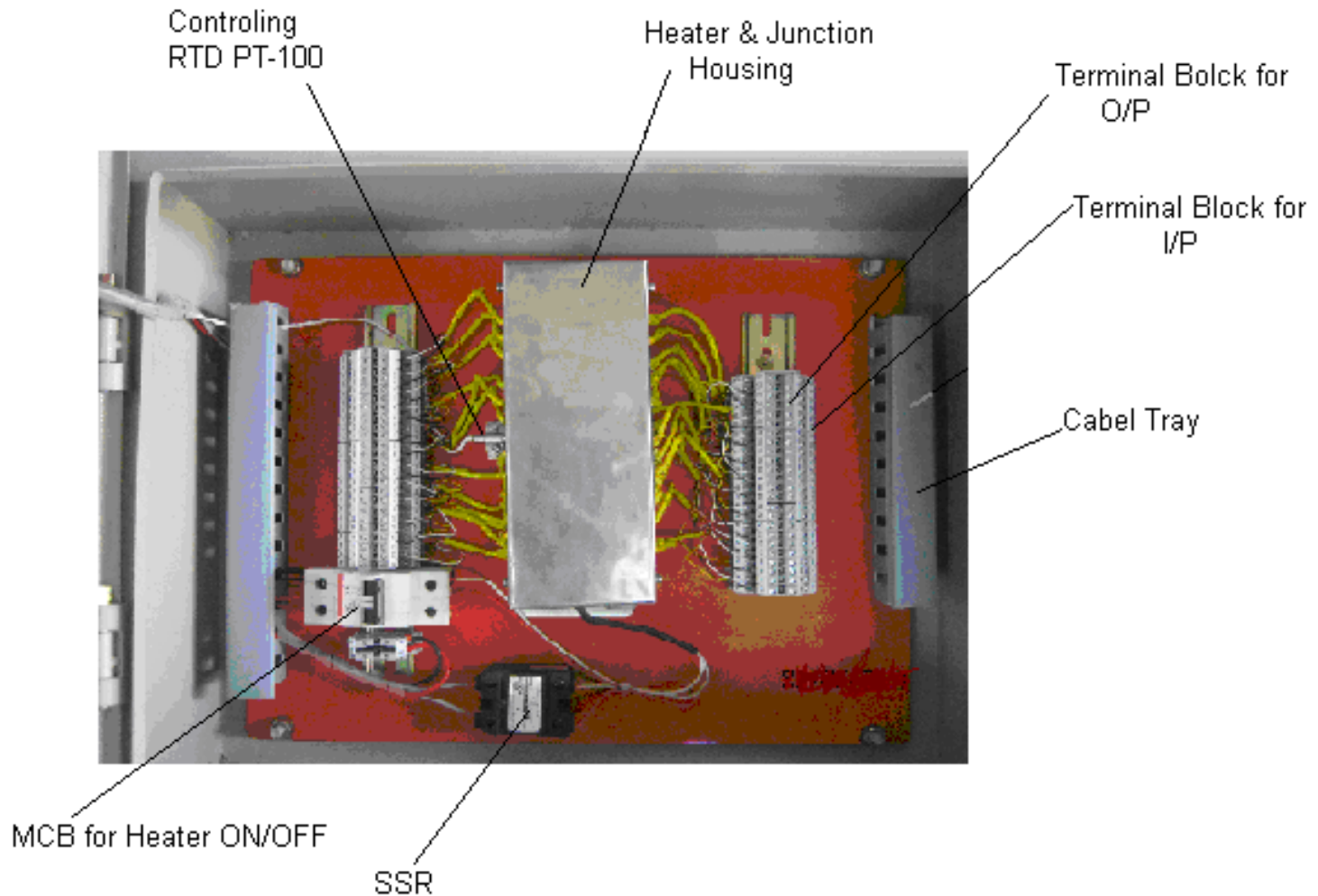
Models offered

- We offer 2 models
 - **CaIREF 0** - Peltier based, used for Maintaining 0 deg C
 - **CaIREF 60** - Resistance heating based generally for maintaining 60 deg C
- These models can be offered in
 - Wall mounting
 - 19" Rack mounting
 - Portable models
- The output connections can be
 - Plug and Jack
 - Terminals

Model / Specs

Spec / Model	CaIREF 0	CaIREF 60
Reference Junction	0°C(or Ambient -25° to 90°)	60°C(or Ambient +10° to 90°)
Accuracy	+/- 0.5°C,errors can be compensated	
Stability	+/-0.05°C	
Stablization time	10 Min	
Input	J/K/T/N/S/R type thermocouple 6-24 channel, to be defined at ordering time	
Control	Peltier cells + RTD + PID	Heater + RTD + PID
Resolution	0.1 °C	
Dimenssion	400 H x 500 W x 200 D mm	
Weight	13 kg	
Mounting	Wall mounting, 19" rack or standalone	
Output	Plug/Jack or Terminals; optional temperature feedback RTD, Alram	
Power supply	230 VAC/ 24 V DC	

Internal Assembly



CalREF

Thanks!

