



0 to 1600°C

- Type R and Type S
- Gas Tight Assembly
- Premium Grade Wire

The Isothermal range of Thermocouple Standards are the result of many years development. The type R and S standards will cover the range from 0°C to 1600°C.

The measuring assembly comprises a 7mm x 300mm or 600mm gas tight 99.7% recrystallized alumina sheath inside which is a 2.5mm diameter twin bore tube holding the thermocouple.

The inner 2.5mm assembly is removable since some calibration laboratories will only accept fine bore tubed thermocouples and some applications require fine bore tubing.

The covered noble metal thermocouple wire connects the measuring sheath to the reference sheath which is a 4.5mm x 250mm stainless steel sheath suitable for referencing in a 0°C reference system. Two thermo electrically free multistrand copper wires (teflon coated) connect the thermocouple to the voltage measuring device.

The thermocouple material is continuous from the hot or measuring junction to the cold, or referencing junction.

Calibration

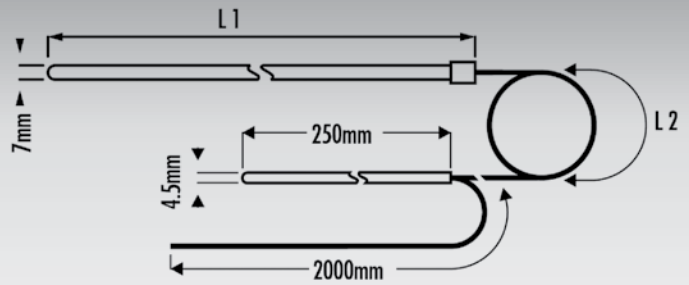
The 1600 is supplied with a certificate giving the error between the ideal value and the actual emf of the thermocouple at the gold point. For types R and S thermocouples, manufacturing tolerances are small and, therefore, the use of a standard reference table is particularly apt. A few calibration points, only, are required to determine the small differences between the characteristics of an individual thermocouple and the standard reference table. As an example of consistency, 48 Isotech thermocouples calibrated at NPL, had a standard deviation of the differences from the reference table value at the gold point (11, 364µV) of only 7µV, equivalent to about 0.5°C.

Thermocouple characteristics are sufficiently smooth to allow interpolation of deviations from the reference table to be carried out over fairly wide temperature spans without introducing unacceptable errors. Isotech can offer a 4-point UKAS calibration for temperatures up to 1100°C (supplied as standard), a 6 point UKAS calibration up to 1300°C with the option of a table of millivolts to degrees Celsius in 10°C steps or, alternatively, arrange for an NPL calibration for temperatures up to 1600°C.

Please contact Isotech to obtain current prices for calibration.

Thermocouple Standard

Type R & S Standard Thermocouple, Model 1600, Premium grade wire, gas tight assembly, No intermediate junctions.



TYPE R & S STANDARD THERMOCOUPLE	CODE	L 1	L 2
	/600	600	1150mm
	/300	300	1450mm

Also available without the physical cold junction - Specify No Cold Junction (NCJ).

Model	1600
Hot Sheath Temperature Range	0°C to 1600°C (R or S)
Emf Vs Temperature	According to relevant document
Response Time	5 minutes
Hot Junction Dimensions	see diagram
Connecting Cable	see diagram
Cold Junction	250mm long x 4.5 diameter
Copper Extension Wires	2000mm
Immersion	100mm min.
Case Dimensions	Height 65mm Width 710mm Depth 165mm Gross Weight 900g
Feature	Removeable inner assembly

The standard thermocouple described can be supplied in the following noble metal combinations

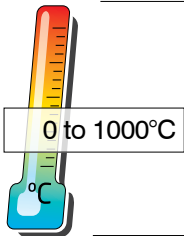
- TYPE R: Platinum vs Platinum 13% Rhodium
- TYPE S: Platinum vs Platinum 10% Rhodium

How to order

- Model 1600 Type R/300
- Model 1600 Type R/600
- Model 1600 Type S/300
- Model 1600 Type S/600

If cold junction not required, specify NCJ.

UKAS calibration is included



Thermocouple Platinum/Gold

- Pure Metal Construction
- Best Homogeneity
- Economic Attention to HTSPRTs

Since 1995 Isotech have been producing various designs of special Pt/Au, Pt/Pd, Pd/Au thermocouples for researchers. From our experience we can now offer the most popular of these, the Pt/Au thermocouple in a standard form.

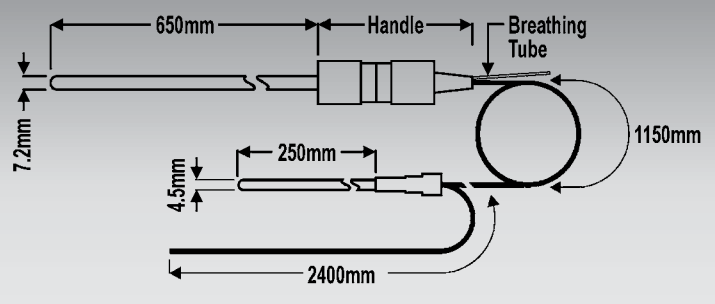
All wires are 99.999+% pure and are fully annealed according to the recommendations of McLaren. Assembly also follows his prescriptions which have never been bettered.

After final assembly and annealing the Pt/Au thermocouples will conform to IEC 26460, Edition 1 2008-07.

For the smallest uncertainties we calibrate the thermocouple at the Zinc, Aluminium and Silver Fixed Points.

We achieve these results because:

1. All materials are selected for their purity and high quality.
2. All parts are pre-aged and annealed prior to construction.
3. The construction allows for differential expansion of the Gold and the Platinum by having a coil of platinum bridge the two thermo elements at their measuring junction.
4. There are no joins between the measuring and reference junctions.
5. The reference junction is also researched and we use thermally pure copper wire of selected diameter which has been pre-annealed in inert gas to maintain the accuracy of the measuring junction.
6. The reference junction needs to be placed in an accurate reference system such as a Water Triple Point Cell or an Isotech Zeref.
7. An article describing in detail the construction, handling and operation of the thermocouple is provided free with each unit.



*Economic alternative to HTSPRTs
Construction allows for differential expansion
Accuracy of ±0.05°C over the whole temperature range*

Temperature Range	0°C to 1000°C	
Sheath materials	Quartz	
Measuring Junction	Stainless Steel	
Reference Junction	Stainless Steel	
Thermo-element Purities		
Platinum	99.999% Pure	
Gold	99.999% Pure	
Calibration	Zinc	0.05°C
Uncertainties	Aluminium	0.05°C
	Silver	0.05°C
	0-1000°C	0.10°C
	Including uncertainty of interpolation / extraction	
Dimensions	Refer to drawing	
Carrying Case	Included as standard	

How to order

Model type: Pt/Au Thermocouple
Including emf vs. temperature traceable calibration certificate and carrying case.
UKAS Calibration optional.