



# Thermocouple Calibration Furnace

## Model 877

- Accuracy 0.25°C at 1000°C
- Central Zone of Zero Heat flux
- Range 100°C to 1300°C

The Saturn spherical furnace comprises a number of concentric shells. The outer shell of spun metal is for containment and support. Inside this is a layer of ceramic fibre. Within the fibre is a ceramic spherical mantle containing the heater windings. In the centre of the furnace is a solid cast ceramic sphere with 8 or 16 tubes, to be used for the thermocouples requiring calibration.

Isotech's calibration furnace is revolutionary from a number of aspects:

It is spherical, and its design ensures a central zone of constant temperature.

Thermocouples are inserted around the circumference of the furnace. When fully inserted the measuring junctions are within a few millimeters of each other at the centre of the sphere.

Up to 15 thermocouples can be calibrated simultaneously. The accuracy is between  $\pm 0.25^\circ\text{C}$  and  $\pm 0.1^\circ\text{C}$  at 1000°C.

Larger tube diameters will give larger gradients, as will larger numbers of tubes. The precision of this furnace has previously been achieved only by using heat pipes.

Because of the design the price is only one half to one third that of a bath with comparable accuracy and much smaller capacity of calibration.

The use of newly developed modern ceramic materials has enabled high accuracy, low mass and high stability to be obtained. The Saturn system will not contaminate your thermocouples unlike some furnaces that have metal equalizing blocks.



Model	877
Temperature Range	100°C to 1300°C
Number of Thermometer Pockets	8 as standard 16 to special requirements
Diameter of Sensors	4 x 6mm + 4 x 8mm
Depth of immersion	180mm
Accuracy	$\pm 0.25^\circ\text{C}$ to $\pm 0.1^\circ\text{C}$ at 1000°C (using comparison techniques.)
Warm-up times*	1 hour to 700°C 3 hours to 1300°C
Stabilisation time*	1 hour to $\pm 0.25^\circ\text{C}$
Communications	Supplied as standard with serial interface. PC adaptor cable, and Cal NotePad.
Power	3kW, 208-240Vac, 50/60Hz 3kW, 115Vac, 50/60Hz
Dimensions	425 mm Diameter Weight 25 kgs

*\*These times may increase as the windings age or if the supply voltage is low.*

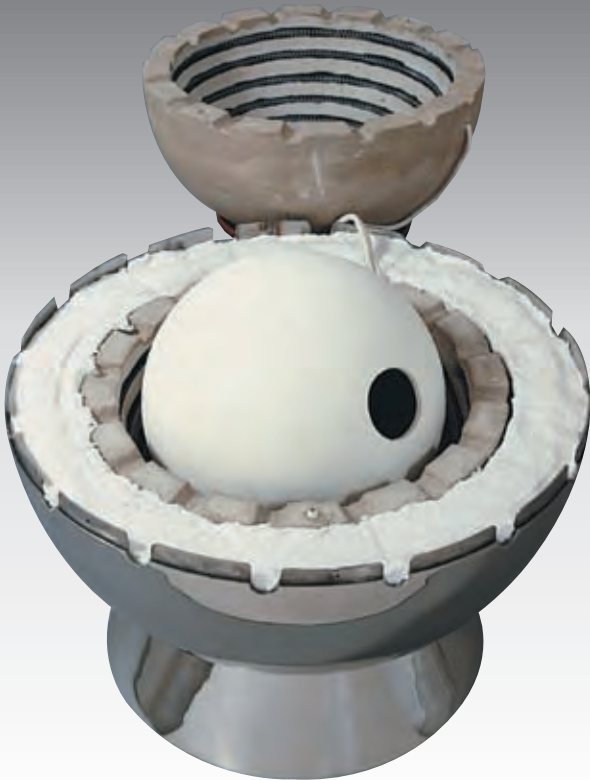
#### Accessories

877/01	Equalising Block 4 x 8mm + 4 x 6mm i.d. (standard)
877/01S	Equalising Block 16 x 6mm (special)
877/01E	Equalising Block - Other configurations (consult Isotech)
877/02	Platinum Foil Temperature Barrier

#### How to Order

877 Thermocouple Calibration Facility including Standard Equalising Block.  
Please specify voltage required

Blackbody Option



Thermocouple Calibration



**Note:**

Spherical furnaces are normally supplied 240 Volts, 50 Hz, 3 kW with 8 sensor insertion points, one of which is used to house the control thermocouple. Eight tubes with a nominal internal diameter of 6 mm have been found to give a very good and stable performance. It is the configuration around which the specification has been written.

**OPTIONS**

To special order, the following options are available, please contact Isotech for details.

- 1 16 Thermocouple Inserts. Because of the extra thermal mass involved in offering this option, an extra 30 minutes should be allowed for full stabilisation.
- 2 Larger Thermocouple Inserts. Inserts of up to 10mm (0.4 inches) diameter can be accommodated in the furnace. Please consult Isotech.
- 3 Platinum wrap can be fitted. Isotech wrap the insert of the Saturn in Platinum foil. Reducing the gradient at 1000°C to an unmeasurable value (less than 1µV difference from 2 type R Thermocouples).
- 4 Blackbody Option.

Each thermocouple is completely isolated in a gas tight closed end tube to prevent any contamination problems during calibration.

Normally the windings will require replacing after a few years of operating (dependent on work cycle) and so the furnace has been designed with ease of maintenance in mind. A spare set of windings is provided free with each furnace, as is a comprehensive handbook.

The external control system uses power feedback to stabilise against supply voltage changes providing greater stability. A digital filter circuit ensures high integrity of measurement, correcting for drift and noise

