



125 to 1100°C

# Furnaces Dual and Heat Pipe

- Essentially Gradient Free
- Heat pipe Operation from Indium to Copper
- Simple Use - no zone offsets to adjust

## Heat Pipe Furnaces

Isotech metrology furnaces have more than 35 years of proven use and are widely used by the worlds' leading NMIs. For the optimal use of fixed point cells the temperature uniformity should be less than 10mK over the length of the fixed point sample CCT/2000-13, "Optimal Realization of the Defining Points of the ITS-90..."

Isotech heat pipe furnaces offer essentially gradient free operation; heat pipes provide the ideal conditions for the creation and maintenance of ITS-90 fixed point cells. Unlike some other companies Isotech can provide heat pipe furnaces to suit Indium, Tin, Zinc, Aluminum, Silver and Copper fixed points.

Plateau length is determined by the difference in temperature between the heat pipe and cell - this can be adjusted to give a plateau of any length of up to tens of hours. Our controllers offer extra resolution and allow adjustment to 0.1°C right up to 1090°C. The Potassium and Sodium models have a cooling coil in the lid with connections to circulate tap water to keep the furnace lid cool protecting the SPRT and reducing heat load into the lab.

A pre warming tube with a temperature approximately equal to that of the heat pipe made of a unique and gas-tight material, is provided to heat the SPRT prior to it being placed in a cell.

The furnaces feature an adjustable independent and adjustable over temperature device to protect expensive cells and SPRTs as well as a second internal over temperature safety device.



### Isotech Heat Pipe Furnaces

Model	Temperature Range	Heat Pipe Type	Cells
17702W	125°C to 250°C	Water	Indium and Tin
17702P	400°C to 1000°C	Potassium	Zinc, Aluminium, Silver
17702S	500°C to 1100°C	Sodium	Aluminium, Silver, Copper

### Accessories

Accessories include equalizing blocks, a fan assembly to keep thermometer handles cool and a thermometer holder. With an equalizing block it is possible to use the furnace for comparison calibration.



Equalizing Block

## Dual Furnaces

In addition to the heat pipe furnaces described the Dual Furnaces incorporate a second furnace which, because of its unique design, will safely (and without contamination) pre and post-condition the thermometers. There is also a separate storage enclosure for up to four thermometers with adequate support for the thermometer head.

With the Dual Furnace the thermometers are removed from their storage enclosure and placed in the pre-conditioning furnace. The furnace is slowly heated to the Cell temperature. The thermometers are protected from contamination by a slow air flux around them. One by one the thermometers are transferred into the cell for 20 to 30 minutes for calibration and thence back to the conditioning furnace. When all the thermometers have been calibrated, the conditioning furnace is slowly cooled back to 400°C whence the thermometers can safely be removed into room temperature.

### Isotech Dual Furnaces

Model	Temperature Range	Heat Pipe Type	Cells
17707	125°C to 250°C	Water	Indium and Tin
17706	400°C to 1000°C	Potassium	Zinc, Aluminium, Silver
17705	500°C to 1100°C	Sodium	Aluminium, Silver, Copper



### New Features

These proven furnace designs have been upgraded to benefit from the latest technology. Fitted with a crystal clear colour display the furnaces are now fully programmable. Programs can be created for the furnace to switch between set temperatures, for example to bring the furnace to the melt or freeze temperature at a desired time, or to lower the furnace temperature after a predetermined time. With the dual furnace programs can be created for the cycling of SPRTs - with the ability to set the annealing temperature and heat up and cool down rates along with the number of temperature cycles.

The PID control parameters are now dynamically optimised at different temperatures optimizing furnace

stability. An Ethernet interface allows the furnace temperature to be monitored across a network whilst a USB Interface allows programs to be copied or for the furnace heat up and cool down history to be exported.



### Common Specification

Uncertainty	<1mk (with cells)
Uniformity	<10mk over length of fixed point sample
Control	0.1°C Resolution: Gain Scheduling Action and Power Feedback
Interfaces	Ethernet and USB Host
Core Size	52 x 432mm

Dimensions	Height - 960mm Width - 600mm Depth - 560mm
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Weight	Dual Furnace 119kg Heat Pipe 115kg
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**How to order**  
Please specify model and voltage required