

# Isocal-6 Series

## Europa-6, Venus 2140, Calisto 2250

The Isocal-6® series offers an exceptionally wide operating range in an easy to use portable package. As discussed previously the Isocal-6 series can be used as a Dry Block, a Liquid Bath, a Blackbody Source for infrared thermometers, a Surface Sensor Calibrator and for performance to a few mK (0.001°C) ITS-90 Fixed Points. Isocal-6 calibrators are available in two models, BASIC and SITE. The BASIC model includes a sophisticated temperature controller with a dual display to show the desired Set Temperature and the actual Dry Block Temperature. The SITE model additionally includes a digital indicator to which an external temperature sensor can be connected providing an accuracy of  $\pm 0.1^\circ\text{C}$ .

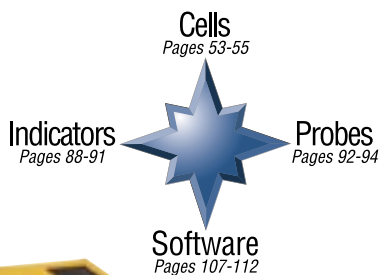
For Dry Block use the unit under test may be compared to the controller value, Isotech recommends the use of an external reference probe connected to the indicator of the SITE model which compensates for the temperature gradient and loading errors. This gives greater accuracy and traceability meeting the requirements of ISO 9000 and other quality standards.

For the best measurement results with liquid bath, surface sensor and blackbody configurations, an external standard probe should always be used, either with the SITE models' indicator or a laboratory performance temperature indicator such as one of the Isotech True Temperature Indicators (TTI).

All Isocal-6 calibrators include as standard: Cal Notepad Windows Software, Serial Computer Interface, Ramp-to-Set-Point Feature. Increased resolution of  $\pm 0.01$  available throughout the range via the PC interface and from -19.99 to +99.99 locally on the auto-ranging front display. The controller features multi-point block to display correction giving excellent absolute accuracy.

The SITE model indicator has a universal sensor input allowing Platinum Resistance Thermometers, Thermocouples (Types K, N, R, S, L, B, PL2, T, J and E) along with Linear Process Inputs including 4-20mA current transmitters to be displayed. The indicator can be programmed with up to five calibration points to provide high accuracy digital probe matching. The indicator and controller are both addressable over the communications link.

**New!** The SITE model can now be used with the supplied Cal Notepad software to test thermostats.

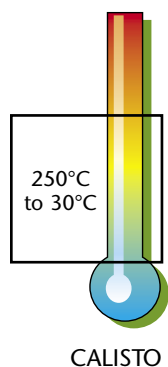
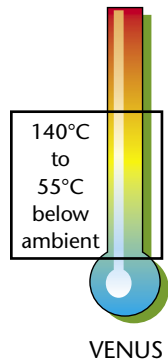
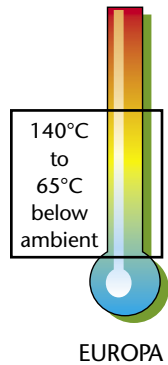


### Key Features

- **Three Temperature Ranges to Choose From**  
Europa  $-45^\circ\text{C}$  to  $140^\circ\text{C}^*$   
Venus  $-30^\circ\text{C}$  to  $140^\circ\text{C}^*$   
Calisto  $+30^\circ\text{C}$  to  $250^\circ\text{C}$   
*\* Based on an ambient of  $20^\circ\text{C}$*
- **6 Calibration Functions in One Portable Design**
- **Calibrate as a Dry or Liquid Bath**  
Thermocouples, platinum resistance thermometers, thermistors, liquid in glass thermometers, or thermostats.
- **Simple to Use** — Outstanding value for the money!
- **SITE Model Includes Universal Input Temperature Indicator** allowing for up to five "correction" points to be programmed
- **Windows Software and PC Interface as Standard**
- **Free Evaluation Report**  
Ask for full data or visit [www.isotechna.com](http://www.isotechna.com)



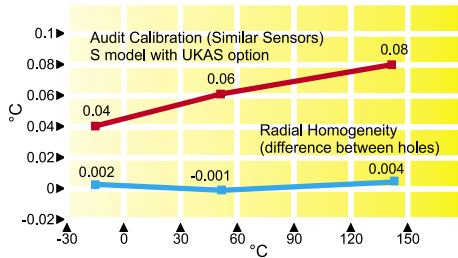
To see the ISOCAL-6 in use ask for our 27-minute video supplied on CD-Rom



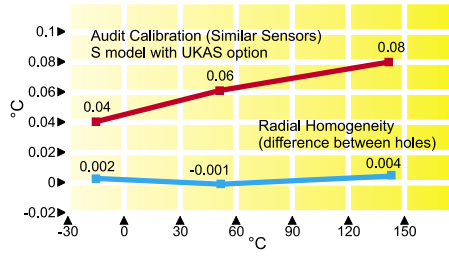
INDUSTRIAL

## Isocal-6, continued

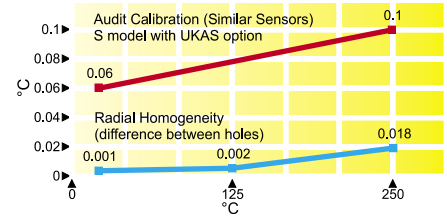
**EUROPA Performance**



**VENUS 2140 Performance**



**CALISTO 2250 Performance**



### Calibration and Uncertainty




A certificate, traceable to NIST, is included as standard.

The accuracy will depend very much on the mode of use and the types of sensor to be used. Please contact Isotech for tutorials and uncertainty calculations and comprehensive evaluation reports. The Isocal-6 meets the Calibration Capacity requirements of EA 10/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

### SPECIFICATIONS

|   |  |
|---|--|
| <b>Temperature Ranges In an Ambient of 20°C</b> | <b>Europa:</b> -45°C to +140°C<br><b>Venus:</b> -30°C to +140°C<br><b>Calisto:</b> +30°C to +250°C   |
| <b>Dry Block Accuracy</b>                       | ±0.3°C<br>Throughout entire temperature range  |
| <b>Absolute Stability Over 30 Minutes</b>       | Dry Block Bath ±0.03°C<br>Stirred Liquid Bath ±0.025°C<br>Ice/Water Bath ±0.001°C<br>Blackbody Source ±0.3°C<br>Surface Sensor Calibrator ±0.5°C<br>ITS-90 Fixed Point Apparatus ±0.0005°C |
| <b>Computer Interface</b>                       | Included with Windows Software   |
| <b>Cooling Time</b>                             | <b>Europa:</b> 140°C to 0°C in 15 min<br><b>Venus:</b> 140°C to 0°C in 15 min<br><b>Calisto:</b> 250°C to Ambient in 25 min  |
| <b>Heating Time</b>                             | <b>Europa:</b> -30°C to 140°C in 15 min<br><b>Venus:</b> -30°C to 140°C in 15 min<br><b>Calisto:</b> Ambient to 250°C in 25 min  |
| <b>Calibration Volume</b>                       | 35mm diameter by 160mm deep  |
| <b>Standard Insert</b>                          | Standard Metal Insert 1/8"; 3/16"; 1/4"; 3/8"; and 1/2" diameter holes, all 6.18" deep   |
| <b>Uniformity</b>                               | ±0.018°C   |
| <b>Display Resolution</b>                       | 0.01 -19.99 to 99.99<br>0.1 -55.0 to -20.0 and 100.0 to 140.0<br>PC can display 0.01 across whole range with the software included   |
| <b>Indicator Units</b>                          | °C, °F, K  |
| <b>Power</b>                                    | <b>Europa:</b> 300 Watts<br><b>Venus:</b> 150 Watts<br><b>Calisto:</b> 300 Watts   |
| <b>Overall Dimensions</b>                       | 302mm x 176mm x 262mm (HxWxD)  |
| <b>Weight</b>                                   | <b>Europa:</b> 30.9 lbs (14kg)<br><b>Venus:</b> 22.5 lbs (10.2kg)<br><b>Calisto:</b> 17.6 lbs (8kg)  |

### ACCESSORIES

|   |  |  |
|---|--|--|
| <b>Metal Block Insert</b><br><br>Type B  | <b>951-06-INA:</b>   | Standard insert type B   |
| <b>Alternative Metal Block Inserts</b><br> <br>Type A Type C | <b>951-02-15:</b><br><b>951-02-15A:</b><br><b>951-06-08:</b>                         | 6 pockets, 9.5mm, 8.0mm, 6.4mm, 6.4mm, 4.5mm, 4.5mm, all 157mm deep<br>Blank Insert<br>Special Insert type C 8mm, 6 x 6.5mm diameter holes, all 157 deep |
| <b>Stirred Liquid Bath Water/Ice Bath</b>   | <b>951-06-01:</b>  | Includes a container, magnetic stirrer and probe guide   |
| <b>Thermometer Support Kit</b>  | <b>951-06-03:</b>  | Allows three thermometers to be suspended in the bath, including liquid in glass types   |
| <b>Oil</b>  | <b>951-06-06:</b><br><b>953-04-01:</b>   | 0.1L (20°C to 200°C)<br>0.1L (+150°C to +250°C) (Calisto Only)   |
| <b>Blackbody Target</b>   | <b>951-06-04:</b>  | Use with Standard Probe (935-14-82)  |
| <b>Surface Sensor Kit</b>   | <b>951-06-02:</b>  | Includes an Insert and an angled PRT   |
| <b>Fixed Point Cells</b>  | <b>ITL-M-7724-M:</b><br><b>D8:</b><br><b>ITL-M-17401-M:</b><br><b>ITL-M-17156-M:</b> | Mercury Slim Cell<br>Water Slim Cell<br>Gallium Slim Cell<br>Indium Slim Cell  |
| <b>Standard Probe</b>   | <b>935-14-82:</b>  | Platinum Resistance Thermometer  |
| <b>Carrying Case</b>  | <b>931-22-64:</b>  | Sturdy case accommodates the unit with room for accessories  |
| <b>NIST Calibration</b>   |  | NIST Calibration provided free with purchase   |

### HOW TO ORDER

|                                     |
|-------------------------------------|
| <b>EUROPA-6</b>                     |
| <b>EUROPA-6-SITE</b>                |
| <b>VENUS 2140</b>                   |
| <b>VENUS 2140-SITE</b>              |
| <b>CALISTO 2250</b>                 |
| <b>CALISTO 2250-SITE</b>            |
| Please specify accessories required |

## Introduction to the Isocal-6 Calibration System

### What is Isocal-6?

The Isocal-6 is a flexible range of calibration systems that can calibrate all types of temperature sensors and share common features.

### What is special about the Isocal-6 range?

Previously temperature calibration baths were specified by type, for example, Dry Block Bath, Liquid Bath, Blackbody, Fixed-Point Apparatus, etc.

Each different calibrator type has unique advantages over another, for example, Portable Stirred Liquid Baths have a large well which is filled with liquid. The temperature sensors are placed directly into the liquid avoiding the need for specially drilled blocks. They are ideal for awkward shaped and short sensors. Angled probes will not readily fit into a metal block but can be placed into the liquid.

Accuracies are in general better than dry blocks due to lack of air gaps and the temperature uniformity of the stirred liquid.

If a laboratory standard temperature indicator is added much greater accuracies than those from Dry Blocks alone can be achieved, due to better axial and radial uniformity and with suitable reference thermometers performance of up to 0.005°C is achievable.

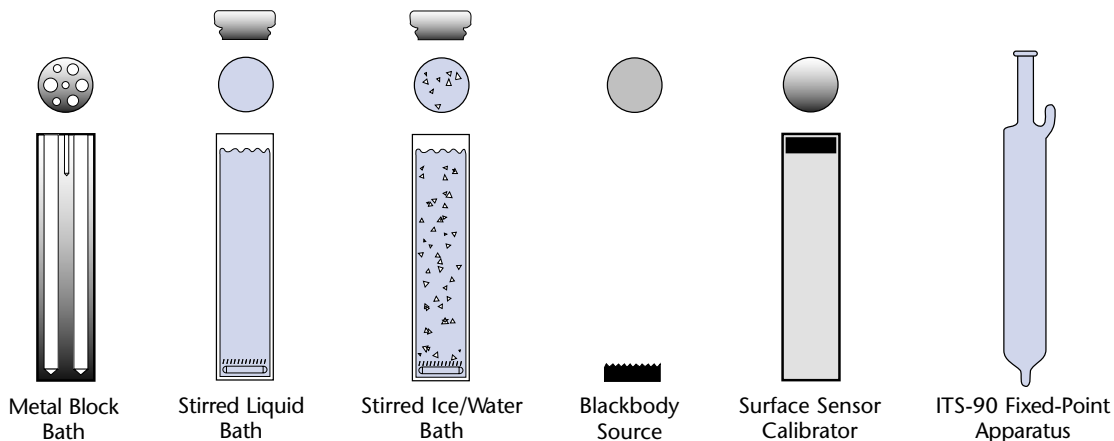
However dryblocks typically heat and cool much faster, are less messy and more portable. For more information on Dryblocks refer to our dedicated section on page 73.

With the Isocal-6 different inserts are added to the bath to allow it to be used in 6 different modes providing a solution for all temperature sensor calibration requirements.

### What are these different modes?

The Isocal-6 includes a removable metal insert as standard for use as a Dry Block Calibrator, with optional accessories the Isocal-6 can perform as:

- A Stirred Liquid Bath
- A Stirred Ice Bath 0°C Reference (Cooling models only)
- A Blackbody Source for IR thermometers
- A Calibrator for Surface Sensors
- An ITS-90 Fixed Point Apparatus



### What if only one option is required?

The advantage of the Isocal-6 is that you need only purchase the main apparatus initially, and add other accessories at any time, to increase your accuracy, stability and overall capability.

### What temperature range is covered?

Different models cover the temperature range from -45°C to 250°C, above this maximum temperature it is not practical to use a stirred liquid bath. For higher temperatures see the other Dry Block Calibrators that go to 1200°C, many with accessories for Surface Sensor and Blackbody use.

The Isocal-6 range is divided into two groups. The first group, including the Europa, Venus and Calisto models are supplied standard in the Dry Block configuration and have a large 35mm x 160mm calibration volume. The second group includes the Hyperion and Drago which are supplied standard in the liquid bath configuration and have a larger calibration volume of 65mm x 190mm for ultimate performance and versatility. Each group has all the Isocal-6 accessories available to it.

### What performance can be achieved?

This varies on the way it is used, for an ITS-90 fixed point apparatus uncertainties of better than 0.001°C can be achieved — see the uncertainty graphs for other modes of operation.

### Local support?

Isotech has an extensive network of authorized representatives throughout North America who are skilled in temperature metrology and eager to provide both before and after sales support.

### Made to last?

All Isotech products are engineered for long life. If you have ever tried to get inside the dashboard of a motor car you will appreciate that cheapness goes with inaccessibility for repair and maintenance. Isotech's products are designed for long life, easy repair, accessibility and maintenance.

*The ISOCAL-6 is currently subject to a patent application (reference 9900158.8).*