3 databookthree

The Industrial Laboratory

Isotech's Millennium Collection of Products for Industrial Temperature Calibration

2006/07

temperature calibration equipment & services

ISOTECH

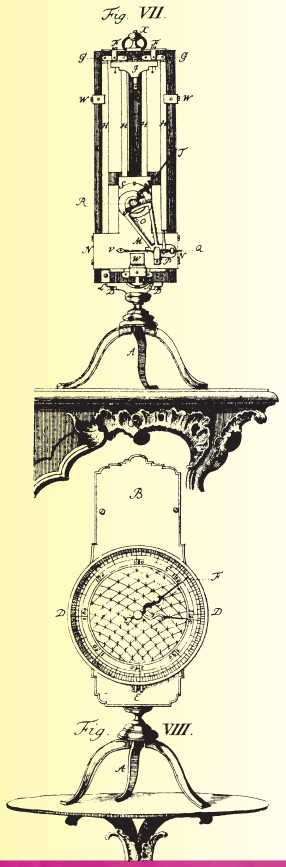
The company is always willing to give technical advice and assistance where appropriate.

Equally because of the program of continual development and improvement, we reserve the right to amend or alter characteristics and design without prior notice.

This publication is for information only.

The print on the front cover shows one of Count Lösers metallic thermometers.

For more information on the history of the thermometer the reader is referred to:-
"A History of the Thermometer and its use in Metrology" by W. E. Knowles Middleton (The Johns Hopkins Press, Baltimore, Maryland).



CONTENTS

Products in this catalogue are all CE Compliant

Databook 3

Introduction to Industrial Calibration

INTRODUCTION: for industrial calibration

DataBook 3 contains Isotech products designed for *Industrial Temperature Calibration.* This is an ambitious claim given that those faced with the task of calibrating industrial sensors encounter sensors of widely varying size, temperature range, accuracies and type.

In this DataBook calibration solutions exist for accuracies from 1°C to less than 0.001°C, temperature ranges from below 0°C to 1200°C, from handheld to bench top devices. Products include Dry Block Calibrators, Liquid Baths, High Temperature Furnaces, Precision Temperature Indicators, Temperature Sensors with supporting services, UKAS Calibration and software.

The industrial calibration products have been enhanced and upgraded benefiting from new instrumentation and superior performance. PC interfaces and supporting software have been introduced as standard along with other enhancements making the products better specified, better value and easier to use.

Benefit from Isotech's premier UKAS Calibration Laboratory

Many manufacturers of temperature calibration equipment do not operate accredited laboratories. At Isotech we remain unique in that in addition to a manufacturer of equipment we also operate a full scale UKAS laboratory calibrating both our own equipment and a full range of temperature equipment for our clients.

Benefit from Experience

Isotech fully understand the calibration needs of our customers. We design and specify products accordingly. Isotech make available full evaluation reports with uncertainty calculations and publish uncertainty graphs.

Dry Blocks from other manufacturers are sometimes specified in *interesting* ways, such as Minimum Operating Temperature -30°C but with an ambient of 5°C, Isotech labs and workshops are kept close to 20°C! We don't specify performances of thermometers only at 0°C we also tell you what it is like at high temperatures. Isotech understand the difference between resolution and accuracy, between accuracy and uncertainty, between "specmanship" and the firm evidence an auditor would expect to see.

Benefit from Innovation

The international award winning ISOCAL-6 series set new standards in temperature calibration, Dry Blocks now include a PC interface and software as standard. The I-CAL software can automatically capture temperature stamped images with a camera, another first from Isotech.

www.isotech.co.uk/industrial

Alternative Methods

of operating an Industrial Laboratory

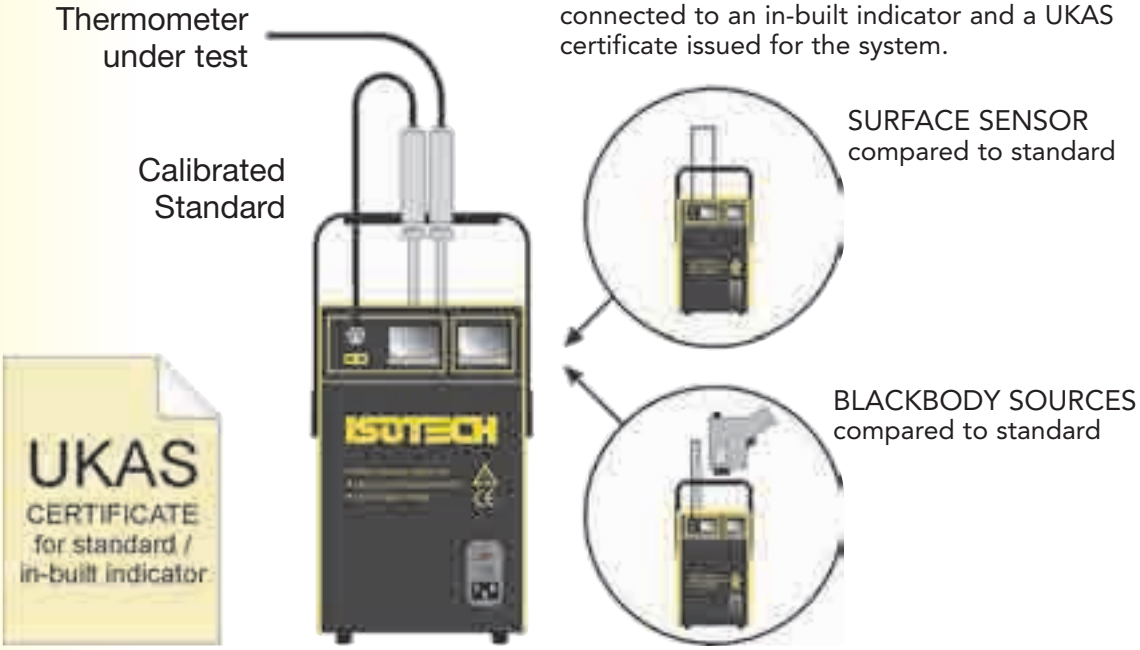
A BASIC DRY BLOCK CALIBRATOR

The thermometer under test is compared to the dry block controller value.
Useful for moderate temperature ranges and quick testing.

AN ISO 9000 CALIBRATION SYSTEM

A thermometer under test is compared to a calibrated standard,
for true traceability and clearly meets the requirements of ISO9000

On the Site models the calibrated standard is connected to an in-built indicator and a UKAS certificate issued for the system.



Many of the products can be used as a Dry Block Calibrator or as a Liquid Bath.

Alternative Methods

of operating an Industrial Laboratory

USING AN EXTERNAL INDICATOR

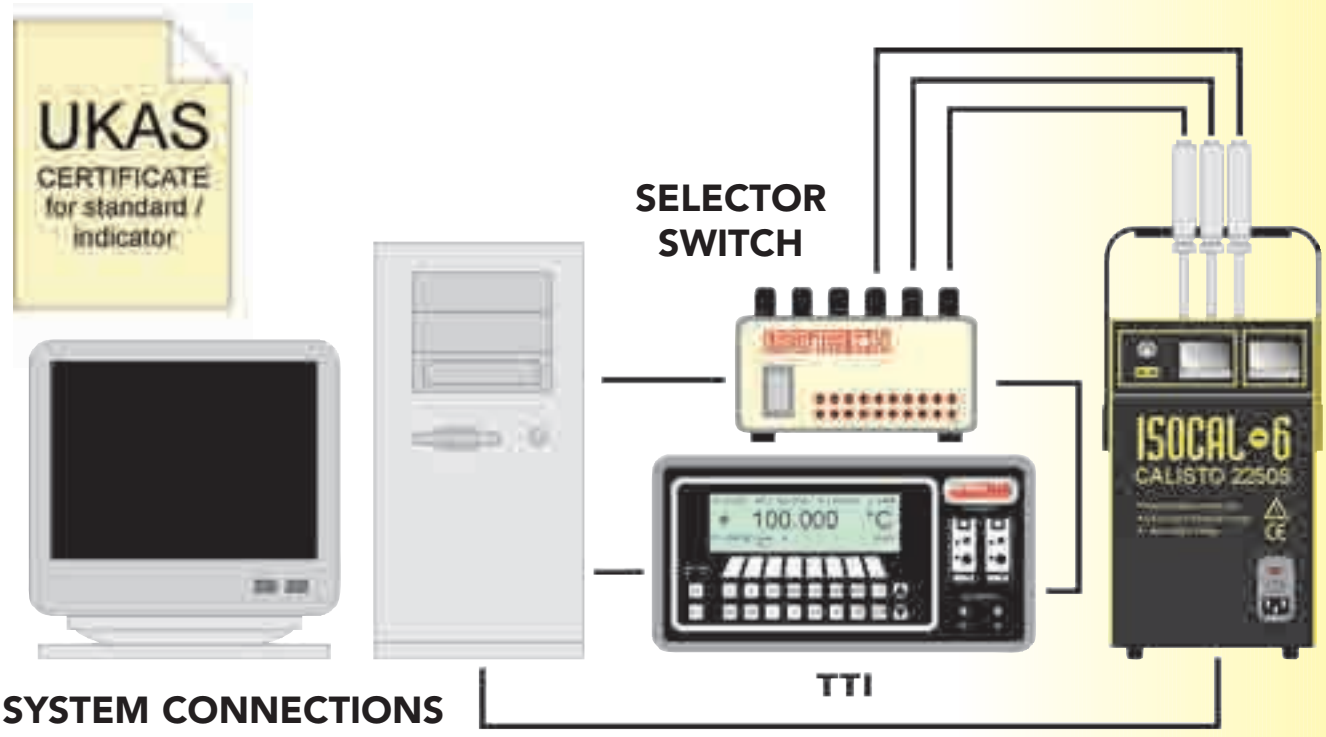
Similar to the previous configuration but an external indicator TTI is used - one TTI can be used with many calibration baths - the bath or baths do not need a calibration certificate, but they need an evaluation report.

Here the B model is shown

Alternatively the S model may be used with the indicator free for use with a unit under test.

AN EXAMPLE OF MULTIPLE SENSOR CALIBRATION

You can add the TTI and Selector Switch for multi-probe calibration - and add I-cal software for affordable automatic calibration systems.



SYSTEM CONNECTIONS

Many of the products can be used as a Dry Block Calibrator or as a Liquid Bath.

Selection Chart

The Industrial Laboratory

Isotech Industrial Temperature Sensor Calibration Solutions

Industrial temperature sensors vary enormously in type, range and requirement, varying temperature ranges, sizes and accuracies. Isotech have developed a diverse range of equipment to meet these varying and frequently demanding requirements.

1 Fast Calibrators

QuickCals

Handheld devices covering low to moderate temperature ranges.
These units are ideal for fast, portable testing of temperature sensors.

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Fast-Cals

NEW *A range of rugged, portable and fast response temperature calibrators. FAST-CALs generate temperatures in the range of -35°C to 650°C. Service Engineers and those working away from the calibration lab will appreciate these affordable and lightweight tools.*

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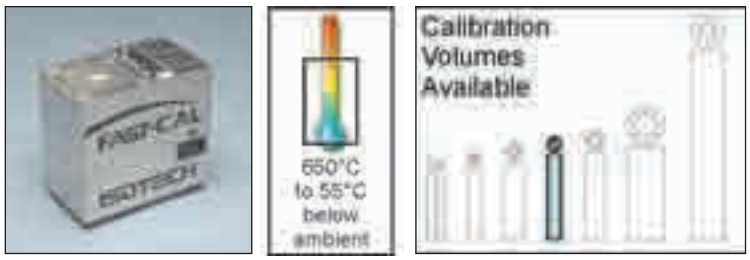

Simulators

NEW *These units do not generate temperature but are used to simulate resistance thermometer and thermocouple signals. They allow digital thermometers and instruments to be rapidly checked and calibrated.*

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2 Portable Liquid Baths

Drago and Hyperion

Portable Liquid Baths have a large well which is filled with a liquid avoiding the need for specially drilled blocks. They are ideal for awkward shaped and short sensors, accuracies are generally better than for Dry Blocks. Isotech Portable Liquid Baths are unique in that they have accessories for other modes of use, including Dry Block operation

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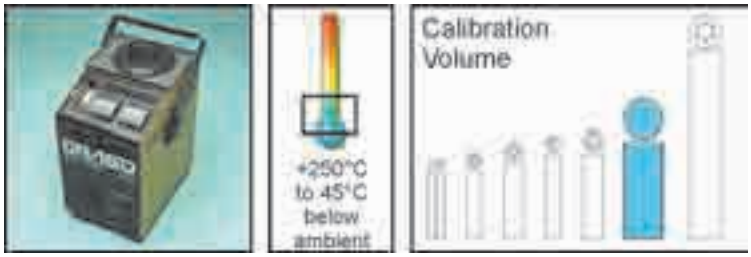

Selection Chart

The Industrial Laboratory

3 ISOCAL-6 Range Europa, Venus, Calisto and Oceanus

Isocal-6 is the flexible choice, this award winning series covers a wide temperature range with a choice of two calibration volume sizes. Uniquely the Isocal-6 can be used as a Dry Block, a stirred Liquid Bath, for fixed point calibration, infrared thermometer calibration, and surface sensor calibration.

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4 Dry Block Calibrators

Apollo, Jupiter, Gemini, Pegasus, Medusa, Oberon

The Dry Block Calibrators complement the Isocal-6 range, but also offer higher temperature ranges. Above temperature ranges of approximately 250°C it is not practical to use stirred liquids due to fumes, risk of ignition and safety considerations. Isotech's higher temperature calibration baths incorporate as many of the Isocal-6 options that are safe and practical to provide. A wide range of calibration volumes are available.

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5 Temperature Indicators, Reference Thermometers and Software

These electronic temperature indicators and reference probes, both platinum resistance thermometers and thermocouples, are ideal for most industrial calibration requirements. Switchboxes allow for multiple channel calibration and supporting software allows for automatic temperature calibration.

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Liquid Baths

Introduction to Liquid Baths

Liquid Baths:

Temperature Range -25°C to 250°C

Portable Stirred Liquid Baths have a large well which is filled with liquid. The liquid is stirred and heated or cooled to the desired temperature.

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 block baths due to lack of air gaps and the temperature uniformity of the stirred liquid.

Liquid Bath Advantages

- Calibrate awkward shaped sensors.
- High Accuracy.
- Excellent temperature uniformity.
- Sensors placed into liquid, no specially drilled inserts required.

Portable Liquid Baths

To calibrate temperature sensors to 250°C look no further than these portable stirred liquid baths. The Hyperion calibrates from -25°C (At ambient of 20°C) to 140°C and the Drago from 30 to 250°C. The calibration volume is 65mm diameter and the useable depth of 160mm gives more than twice the volume of alternative products.

Stirred liquid baths are suitable for temperature sensors of all types, shapes and sizes, angled probes, bent probes and short probes with large mounting heads can all be readily accommodated, an advantage over Dry Block Calibrators.

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

These models include a high accuracy inbuilt digital temperature indicator and a reference probe. This independent measurement system is used as a reference to which the thermometers under test are compared. This method gives good accuracy largely eliminating temperature gradient and loading errors and provides traceable temperature calibration.

The data on liquid baths in this book are based on Methanol with some water added to reduce flammability, medium or high temperature silicon oils.

The variety of applications for stirred liquid baths is endless, for example one user works only from –10°C to +50°C. Water with anti-freeze (Ethylene Glycol) added is a cheap and effective liquid over this range, however 100% Ethylene Glycol becomes too viscous at low temperatures to circulate properly.

If you have a particular range why not contact us for advice.

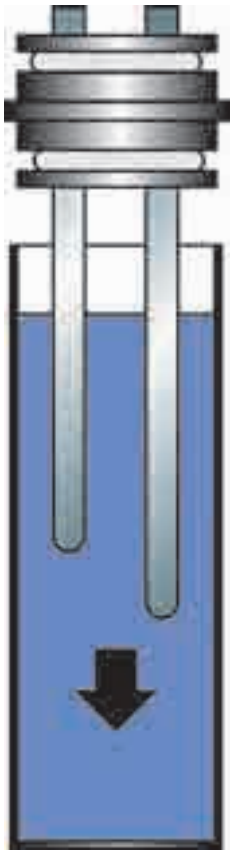
Liquid Baths

Liquid Bath Accessories

Probe Basket

Supplied as standard.

Simply place the probes in the basket.



Support Kit

Optional.

Use in place of the basket to suspend up to eight probes with a diameter range of 5 - 8mm. Useful with liquid in glass thermometers as well as RTDs and TCs. Fits both directly into the block or into the optional liquid containers.

Part Number 936-06-08

Introduction to Liquid Baths

Lid

Supplied as standard.

Seals the bath and prevents spills whilst the unit is being moved.

Part Number 936-02-14

Metal Insert

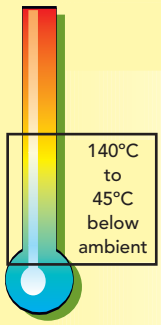
Optional.

A Metal Insert can be placed into the calibration volume to convert for Dry Block use. The standard block has eight 8mm pockets and two 4.5mm pockets all 157mm deep. Blank and specially drilled inserts are available.

Standard Insert Part Number 936-06-01

936 Hyperion PLUS

ISOCAL-6® Range



To calibrate temperature sensors to 250°C look no further than Isotech's portable stirred liquid baths. The Hyperion calibrates from 45°C below ambient to 140°C and the Drago from 30 to 250°C see page 12. The large calibration volume is more than twice the size of alternative products. The useable area is a full 65mm diameter with a depth of 160mm, the overall well depth of 190mm allows room for space at the top and the bottom magnetic stirrer.

Stirred liquid baths are suitable for temperature sensors of all types, shapes and sizes. Accuracies are much greater than those from Dry Blocks alone and with suitable reference thermometers performance of up to 0.005°C is achievable.

The Hyperion is available in two models. If the liquid is directly in the block then the controller only model, or Basic (B) model, can be selected. This model is also suitable where an external indicator and standard will be used. Alternatively the site model (S) includes a built in temperature indicator for high accuracy or for best accuracy an external indicator can be used, an ideal combination is a TTI model and a 935-14-16 Standard Probe, see Indicators, Probes and Accessories section. The S model can be provided with UKAS certification.

The Hyperion can also be used with the supplied Cal NotePad software to automatically calibrate thermostats.

When using a separate indicator and probe then different accessories can be added for Dry Block, Blackbody, Surface Sensor, Liquid Containers and even ITS-90 fixed point operation.

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±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 good absolute accuracy.

The S model has 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 on the inbuilt indicator. 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.

Features

- **65mm Diameter Calibration Volume.**
- **Portable Liquid Bath** for high accuracy calibration of awkward shaped sensors.
- **Convertible for Dry Block Operation** and more.
- **Calibrate all Sensor types.**
- **Windows Software and PC Interface as standard.**

936 Hyperion PLUS

ISOCAL-6® Range

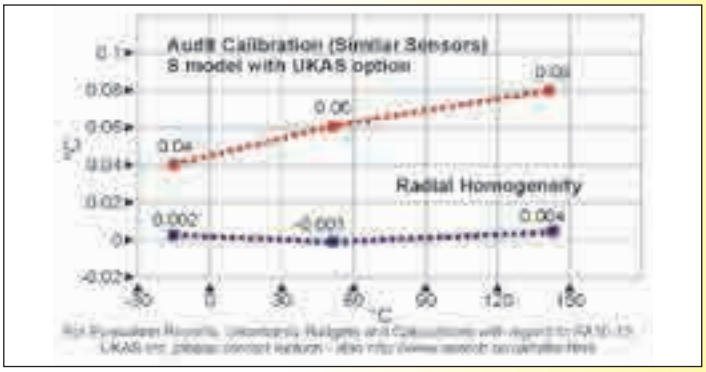
Options

Stirred Liquid Bath Water / Ice Bath	936-06-02	Includes a container, magnetic stirrer and probe basket
Metal Block Insert	936-06-01a	Standard Insert 8 x 8mm + 2 x 4.5mm diameter holes 157mm deep
	936-06-01b	Blank Insert
	936-06-01c	Special Insert. *Contact Isotech with your requirements*
Blackbody Target	936-06-03	Use with Standard Probe (935-14-61DB)
Surface Sensor Kit	936-06-04	Includes an Insert and an angled PRT.
Fixed Point Cells	B8 17401 Slim 936-06-09	Water Slim Cell Gallium Slim Cell Slim Triple point of Water Cell/Gallium Cell Holder Assembly
Standard Probe	935-14-61DB	Platinum Resistance Thermometer
UKAS Calibration	UKAS Calibration available to Order	
Carrying Case	931-22-65	Sturdy case accommodates the unit
Liquid	936-06-07	1 Litre of C10 Oil (-35°C to +140°C)
Support Kit	936-06-08	Fits into the top of the block or liquid container and supports up to eight thermometers into the liquid. Suits probes of 5mm to 8mm in diameter.

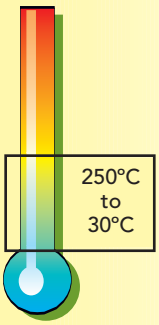
To see the ISOCAL-6 in use ask for our 27 minute video supplied on CD-Rom

Note: Instead of putting liquids directly in the block liquid containers can be used to facilitate rapid change of liquids.
When using a liquid container, Dry Block Insert, Blackbody Target or the Surface Sensor Kit a separate reference themometer should be used to compensate for the varying offset between the controller and the accessory temperature.
Suitable choices include the SITE model with probe or a stand alone indicator such as an Isotech TTI model.

Hyperion PLUS Performance - Dry Block



Model No.	HYPERION PLUS	
Temperature Range	45 below ambient to +140°C (absolute minimum -45°C)	
Absolute stability over 30 minutes	Stirred Liquid Bath Dry Block Bath Ice / Water Bath Blackbody Source Surface Sensor Calibrator ITS-90 Fixed Point Apparatus	±0.025°C ±0.03°C ±0.001°C ±0.3°C ±0.5°C ±0.0005°C
Computer Interface	Included with Windows Software	
Thermal Performance	As a liquid comparison bath Uniformity down to ±0.005°C over the full range	
Heating / Cooling as a liquid bath	20°C to 140°C in 40mins 140°C to 20°C in 90mins 20°C to -25°C in 80mins	
Uncertainties	Refer to Uncertainties Graph	
Calibration volume	65mm diameter by l6Omm deep	
Display Resolution	0.01 0.1	-19.99 to 99.99 -55.0 to -20.0 and 100.0 to 140.0 PC can display 0.01 across whole range with the software included
Indicator units	°C, °F, K	
Power	108 to 120V (50/60 Hz) or 208 to 240V (50/60 Hz) 200 Watts	
Overall dimensions	Height Width Depth	302mm 176mm 262mm
Weight	12kg	
How to Order	**Hyperion PLUS** Please specify model type required Please specify voltage required Please specify options required	



ISOCAL-6®

To calibrate temperature sensors to 250°C look no further than Isotech's portable stirred liquid baths. The Drago calibrates from 30 to 250°C and the Hyperion from 45°C below ambient to 140°C, see page 10. The large calibration volume is more than twice the size of alternative products. The useable area is a full 65mm diameter with a depth of 160mm, the overall well depth of 190mm allows room for space at the top and the bottom magnetic stirrer.

Stirred liquid baths are suitable for temperature sensors of all types, shapes and sizes. Accuracies are much greater than those from Dry Blocks alone and with suitable reference thermometers performance of up to 0.005°C is achievable.

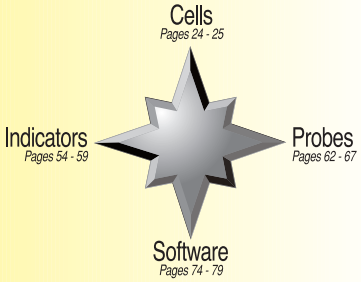
The Drago is available in two models. If the liquid is directly in the block then the controller only model, or Basic (B) model, can be selected. This model is also suitable where an external indicator and standard will be used. Alternatively the site model (S) includes a built in temperature indicator for high accuracy or for best accuracy an external indicator can be used, an ideal combination is a TTI model and 935-14-16 Standard Probe, see Indicators, Probes and Accessories section. The S model can be provided with UKAS certification.

The Drago can also be used with the supplied Cal NotePad software to automatically calibrate thermostats.

When using a separate indicator and probe then different accessories can be added for Dry Block, Blackbody, Surface Sensor, Liquid Containers and even ITS-90 fixed point operation.

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±0.01 available throughout the range via the PC interface and from 0.01 to +99.99 locally on the auto-ranging front display. The controller features multi-point block to display correction giving good absolute accuracy.

The S model has 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 on the inbuilt indicator. 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.

Features

- **65mm Diameter Calibration Volume.**
- **Portable Liquid Bath** for high accuracy calibration of awkward shaped sensors.
- **Convertible for Dry Block Operation** and more.
- **Calibrate all Sensor types.**
- **Windows Software and PC Interface as standard.**

934 DRAGO PLUS

ISOCAL-6® Range

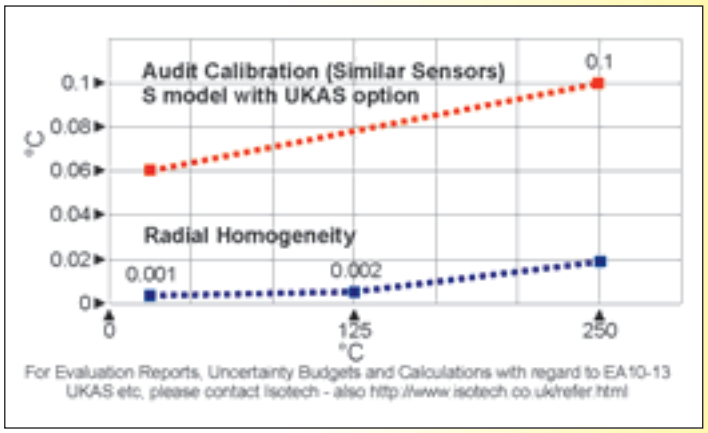
Options

Stirred Liquid Bath Water / Ice Bath	936-06-02	Includes a container, magnetic stirrer and probe basket
Metal Block Insert	936-06-01a	Standard Insert 8 x 8mm + 2 x 4.5mm diameter holes 157mm deep
	936-06-01b	Blank Insert
	936-06-01c	Special Insert. *Contact Isotech with your requirements*
Blackbody Target	936-06-03	Use with Standard Probe (935-14-61DB)
Surface Sensor Kit	936-06-04	Includes an Insert and an angled PRT.
Fixed Point Cells	17401 Slim 936-06-09	Gallium Slim Cell Gallium Slim Cell Holder Assembly
Standard Probe	935-14-61DB	Platinum Resistance Thermometer
UKAS Calibration	UKAS Calibration available to Order	
Carrying Case	931-22-65	Sturdy case accommodates the unit
C20 Oil	580-06-09	1 Litre of C20 Oil (from ambient to + 200°C)
Very High Temp. Oil	915/09	1 Litre of V.H.T. Oil (from + 150°C to 250°C)
Support Kit	936-06-08	Fits into the top of the block or liquid container and supports up to eight thermometers into the liquid. Suits probes of 5mm to 8mm in diameter.

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

Note: Instead of putting liquids directly in the block liquid containers can be used to facilitate rapid change of liquids.
When using a liquid container, Dry Block Insert, Blackbody Target or the Surface Sensor Kit a separate reference themometer should be used to compensate for the varying offset between the controller and the accessory temperature.
Suitable choices include the SITE model with probe or a stand alone indicator such as an Isotech TTI model.

Drago PLUS Performance - Dry Block



Model No.	DRAGO PLUS	
Temperature Range	+ 30°C to + 250°C in an ambient of 25°C or below	
Absolute stability over 30 minutes	Stirred Liquid Bath Dry Block Bath Ice / Water Bath Blackbody Source Surface Sensor Calibrator ITS-90 Fixed Point Apparatus	±0.025°C ±0.03°C ±0.001°C ±0.3°C ±0.5°C ±0.0005°C
Computer Interface	Included with Windows Software	
Thermal Performance	As a liquid comparison bath Uniformity down to ±0.005°C over the full range	
Calibration volume	65mm diameter by l6Omm deep	
Display Resolution	0.01 Up to 99.99 0.1 100.0 to 250.0°C PC can display 0.01 across whole range with the software included	
Indicator units	°C, °F, K	
Power	100 to 120V (50/60 Hz) or 200 to 240V (50/60 Hz) 1000 Watts	
Overall dimensions	Height 302mm Width 176mm Depth 262mm	
Weight	8kg	
How to Order	**Drago PLUS** Please specify model type required Please specify voltage required Please specify options required	

What is Isocal-6?

Isocal-6 is a range of calibration systems that can calibrate all types of thermometer and share common features.

What is special about the Isocal-6 range?

Previously temperature calibration baths were specified by type, e.g. A Dry Block Bath, A Liquid Bath etc.

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

What are these different modes?

The Isocal-6 includes a removable 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?

One of the advantages is that you need only purchase the desired option but other accessories can be added at any time.

What temperature range is covered?

Different models cover the temperature range from below -40°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.

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.

International Support?

Isotech have a global network of authorised agents and distributors providing both before and after sales support.

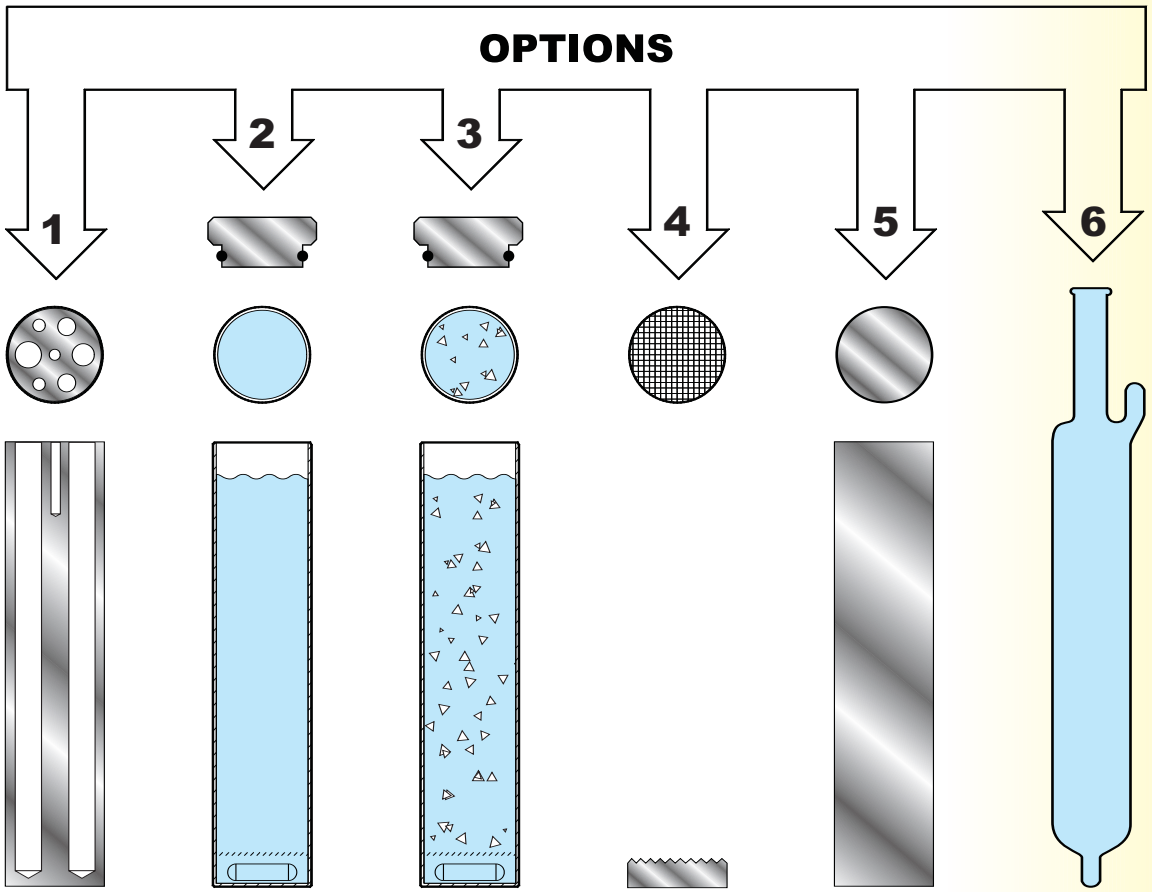
Made to last?

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).

The ISOCAL-6® is the only calibration system in the World (patent application 9900158.8) to offer you six calibration baths in a single simple product.

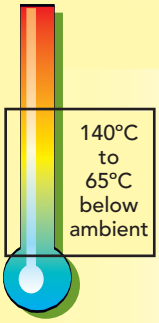
1. **Metal Block Bath**
2. **Stirred Liquid Bath**
3. **Stirred Ice/Water Bath**
4. **Black Body Source**
5. **Surface Sensor Calibrator**
6. **ITS-90 Fixed Point Apparatus**



This schematic shows the six options available for the ISOCAL-6® range of calibration baths.

Europa-6PLUS

ISOCAL-6® Range



The EUROPA[PLUS] offers an exceptionally wide operating range in an easy to use portable package. As part of the ISOCAL-6 series the EUROPA[PLUS] 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. The EUROPA[PLUS] is available in two models, the BASIC (B) and the SITE (S). The B model includes a sophisticated temperature controller with a dual display for Set Temperature and Dry Block Temperature, refer to page 27 for further details. The S model additionally includes an in-built digital indicator to which an external temperature sensor can be connected.

For Dry Block use the unit under test may be compared to the controller value, Isotech recommend the use of an external probe connected to the indicator of the Site model (see page 23) 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 liquid bath, surface sensor and blackbody use an external standard probe should always be used, either with the S models indicator or an external indicator, e.g. an Isotech TTI model. For laboratory use the EUROPA[PLUS] can be used with a laboratory performance temperature indicator such as one of the Isotech True Temperature Indicators (TTI).

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±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 good absolute accuracy.

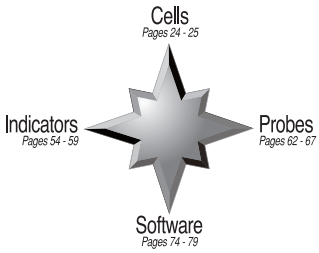
PLUS FEATURES

The S model has 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 on the inbuilt indicator. 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

- **Extreme Low Temperature Operation** -45°C in an ambient of 20°C - Use for Triple Point of Mercury, 0°C, 121°C (250°F), 135°C.
- **Realise ITS-90 Fixed Points -** the EUROPA[PLUS] can be used with Slim Mercury, Gallium and Triple Point of Water Fixed Point Cells.
- **Calibrate as a Dry or Liquid Bath,** thermocouples, platinum resistance thermometers, thermistors, liquid in glass, thermostats, semiconductor types.
- **S 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.isotech.co.uk/industrial



Europa-6PLUS

ISOCAL-6® Range

Options

1. Metal Block Insert	951-02-15	Standard Insert *Included*
	951-02-15A	Blank Insert *Insert without pockets for local machining*
	951-02-15C	Special Insert *Contact Isotech with your requirements*

Alternative Metal Block Inserts		
	951-06-07	Standard Insert type B 13mm , 10mm, 8mm, 5mm and 3.5mm diameter holes, all 157mm deep
	951-06-08	Special Insert type C 8mm, 6 x 6.5mm diameter holes, all 157 deep

2. Stirred Liquid Bath 3. Water/Ice Bath	951-06-01	Includes a container, magnetic stirrer and probe guide
Thermometer Support Kit	951-06-03	*Allows three thermometers to be suspended in the bath, including liquid in glass types*
Oil	520-05-01	0.1L *-35°C to 140°C*

4. Blackbody Target	951-06-04	Use with Standard Probe (935-14-82)
5. Surface Sensor Kit	951-06-02	Includes an Insert and an angled PRT.
6. Fixed Point Cells	17724 Slim	Mercury Slim Cell
	B8	Water Slim Cell
	17401 Slim	Gallium Slim Cell
Standard Probe	935-14-82	Platinum Resistance Thermometer
UKAS Calibration	UKAS Calibration available to Order	
Carrying Case	931-22-64	Sturdy case accommodates the unit with room for accessories

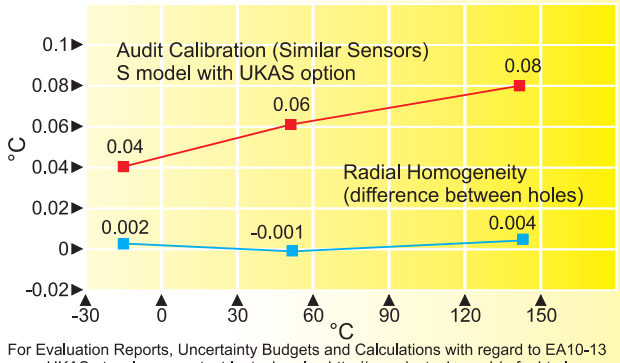
To see the ISOCAL-6 in use ask for our 27 minute video supplied on CD-Rom

Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

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 Europa^{PLUS} meets the Calibration Capacity requirements of EA I0/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

EUROPA^{PLUS} Performance

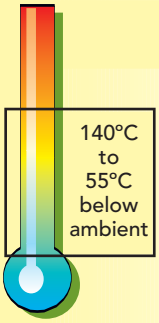


For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	EUROPA^{PLUS}	
Temperature Range	65°C below ambient to +140°C (absolute minimum -55°C)	
Absolute stability over 30 minutes	Dry Block Bath	±0.03°C
	Stirred Liquid Bath	±0.025°C
	Ice/Water Bath	±0.001°C
	Blackbody Source	±0.3°C
	Surface Sensor Calibrator	±0.5°C
	ITS-90 Fixed Point Apparatus	±0.0005°C
Computer Interface	Included with Software	
Cools from	140°C to 0°C in 15 minutes	
Heats from	-30°C to 140°C in 15 minutes	
Best Performance	See Graph	
Calibration volume	35mm diameter by 160mm deep	
Standard Insert	6 pockets, 9.5mm, 8.0mm, 6.4mm, 6.4mm, 4.5mm, 4.5mm, all 157mm deep	
Uniformity	±0.018°C	
Display Resolution	0.01	-19.99 to 99.99
	0.1	-55.0 to -20.0 and 100.0 to 140.0
		PC can display 0.01 across whole range with the software included
Indicator units	°C, °F, K	
Power	100 to 120V (50 / 60 Hz) or 200 to 240V (50 / 60 Hz) 300 Watts	
Overall dimensions	Height	322mm
	Width	176mm
	Depth	262mm
Weight	14kg	
How to Order	EUROPA-6^{PLUS} Please specify model type required Please specify voltage required Please specify options required	

Venus^{PLUS} 2140

ISOCAL-6® Range



The Venus^{PLUS}2140 range offers outstanding performance in an easy to use portable package. As part of the ISOCAL-6 series the Venus^{PLUS}2140 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. The Venus is available in two models, the BASIC (B) and the SITE (S). The B model includes a sophisticated temperature controller with a dual display for Set Temperature and Dry Block Temperature, refer to page 27 for further details. The S model additionally includes an in-built digital indicator to which an external temperature sensor can be connected.

For Dry Block use the unit under test may be compared to the controller value, Isotech recommend the use of an external probe connected to the indicator of the Site model (see page 23) 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 Liquid Bath, Surface Sensor or Blackbody use an external thermometer should always be used - either with the S model or the B model and a separate stand-alone indicator. For laboratory use the Venus can be used with a laboratory performance temperature indicator such as one of the Isotech True Temperature Indicators (TTI).

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±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 good absolute accuracy.

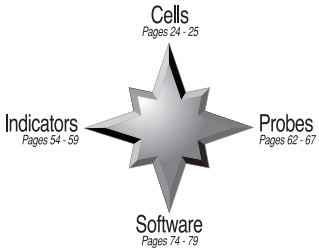
PLUS FEATURES

The S model has 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 on the inbuilt indicator. 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

- **Calibrate Whole Measurement Loop -** using a heat source rather than an electrical simulator a test instrument and probe can be calibrated as a system.
- **Calibrate as a Dry or Liquid Bath,** thermocouples, platinum resistance thermometers, thermistors, liquid in glass, thermostats, semiconductor types.
- **Covers key calibration points** from below to above ambient, 0°C, 121°C (250°F), 135°C.
- **Simple To Use -** Outstanding Value for Money!
- **S 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.isotech.co.uk/industrial.



Venus^{PLUS} 2140

ISOCAL-6® Range

Options

1. Metal Block Insert	951-02-15	Standard Insert *Included*
	951-02-15A	Blank Insert *Insert without pockets for local machining*
	951-02-15C	Special Insert *Contact Isotech with your requirements*

Alternative Metal Block Inserts

	951-06-07	Standard Insert type B 13mm , 10mm, 8mm, 5mm and 3.5mm diameter holes, all 157mm deep
	951-06-08	Special Insert type C 8mm, 6 x 6.5mm diameter holes, all 157 deep

2. Stirred Liquid Bath 3. Water/Ice Bath	951-06-01	Includes a container, magnetic stirrer and probe guide
Thermometer Support Kit	951-06-03	*Allows three thermometers to be suspended in the bath, including liquid in glass types*
	520-05-01	0.1L of Oil *-35°C to 140°C*
4. Blackbody Target	951-06-04	Use with Standard Probe (935-14-82)
5. Surface Sensor Kit	951-06-02	Includes an Insert and an angled PRT.
6. Fixed Point Cells	D8 17401 Slim	Water Slim Cell Gallium Slim Cell
Standard Probe	935-14-82	Platinum Resistance Thermometer
UKAS Calibration	UKAS Calibration available to Order	
Carrying Case	931-22-64	Sturdy case accommodates the unit with room for accessories

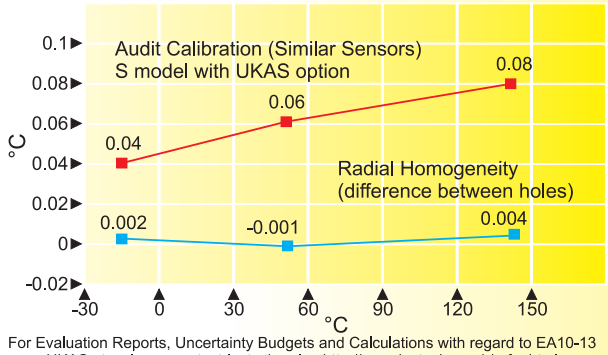
To see the ISOCAL-6 in use ask for our 27 minute video supplied on CD-Rom

Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

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 Venus^{PLUS} 2140 meets the Calibration Capacity requirements of EA I0/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

VENUS^{PLUS} 2140 Performance

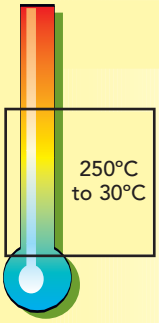


For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	VENUS^{PLUS} 2140	
Temperature Range	55°C below ambient to +140°C (absolute minimum -55°C)	
Absolute stability over 30 minutes	Dry Block Bath	±0.03°C
	Stirred Liquid Bath	±0.025°C
	Ice/Water Bath	±0.001°C
	Blackbody Source	±0.3°C
	Surface Sensor Calibrator	±0.5°C
	ITS-90 Fixed Point Apparatus	±0.0005°C
Computer Interface	Included with Software	
Cools from	140°C to 0°C in 15 minutes	
Heats from	-30°C to 140°C in 15 minutes	
Best Performance	See Graph	
Calibration volume	35mm diameter by 160mm deep	
Standard Insert	6 pockets, 9.5mm, 8.0mm, 6.4mm, 6.4mm, 4.5mm, 4.5mm, all 157mm deep	
Uniformity	±0.018°C	
Display Resolution	0.01	-19.99 to 99.99
	0.1	-55.0 to -20.0 and 100.0 to 140.0
		PC can display 0.01 across whole range with the software included
Indicator units	°C, °F, K	
Power	100 to 120V (50 / 60 Hz) or 200 to 240V (50 / 60 Hz) 150 Watts	
Overall dimensions	Height	302mm
	Width	176mm
	Depth	262mm
Weight	10.2kg	
How to Order	Venus^{PLUS} 2140 Please specify model type required Please specify voltage required Please specify options required	

Calisto^{PLUS} 2250

ISOCAL-6® Range



The Calisto^{PLUS}2250 range offers outstanding performance in an easy to use portable package. As part of the ISOCAL-6 series the Calisto^{PLUS}2250 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. The Calisto^{PLUS}2250 is available in two models, the BASIC (B) and the SITE (S). The B model includes a sophisticated temperature controller with a dual display for Set Temperature and Dry Block Temperature, refer to page 27 for further details. The S model additionally includes an in-built indicator to which an external temperature sensor can be connected.

For Dry Block use the unit under test may be compared to the controller value, Isotech recommend the use of an external probe connected to the indicator of the Site model (see page 23) 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 Liquid Bath, Surface Sensor or Blackbody use an external thermometer should always be used - either with the S model or the B model and a separate stand-alone indicator. For laboratory use the Calisto^{PLUS}2250 can be used with a laboratory performance temperature indicator such as one of the Isotech True Temperature Indicators (TTI).

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±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 good absolute accuracy.

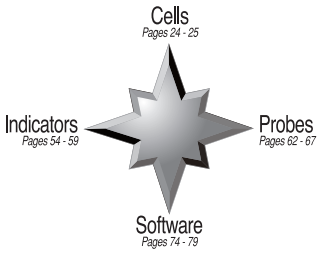
PLUS FEATURES

The S model has 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 on the inbuilt indicator. 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

- **Calibrate Whole Calibration Loop -** using a heat source rather than an electrical simulator a test instrument and probe can be calibrated as a system.
- **Calibrate as a Dry or Liquid Bath,** thermocouples, platinum resistance thermometers, thermistors, liquid in glass, thermostats, semiconductor types.
- **Covers key calibration points** 37°C, 121°C (250°F), 135°C.
- **Simple To Use -** Outstanding Value for Money!
- **S 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.isotech.co.uk/industrial



Calisto^{PLUS} 2250

ISOCAL-6® Range

Options

1. Metal Block Insert	951-02-15	Standard Insert *Included*
	951-02-15A	Blank Insert *Insert without pockets for local machining*
	951-02-15C	Special Insert *Contact Isotech with your requirements*

Alternative Metal Block Inserts		
	951-06-07	Standard Insert type B 13mm , 10mm, 8mm, 5mm and 3.5mm diameter holes, all 157mm deep
	951-06-08	Special Insert type C 8mm, 6 x 6.5mm diameter holes, all 157 deep

2. Stirred Liquid Bath	951-06-01	Includes a container, magnetic stirrer and probe guide
Thermometer Support Kit	951-06-03	*Allows three thermometers to be suspended in the bath, including liquid in glass types*
C20 Oil	951-06-06	0.1L *(Ambient to +200°C)*
Oil	953-04-01	0.1L *(+150°C to +250°C)*
4. Blackbody Target	951-06-04	Use with Standard Probe (935-14-82)
5. Surface Sensor Kit	951-06-02	Includes an Insert and an angled PRT.
6. Fixed Point Cells	17401 Slim	Gallium Slim Cell
UKAS Calibration	UKAS Calibration available to Order	
Standard Probe	935-14-82	Platinum Resistance Thermometer
Carrying Case	931-22-64	Sturdy case accommodates the unit with room for accessories

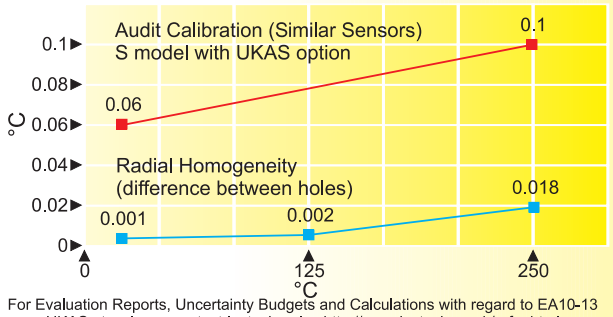
To see the ISOCAL-6 in use ask for our 27 minute video supplied on CD-Rom

Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

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 Calisto^{PLUS} 2250 meets the Calibration Capacity requirements of EA I0/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

CALISTO^{PLUS}2250 Performance

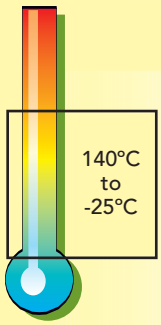


For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	CALISTO^{PLUS} 2250	
Temperature Range	+30°C to +250°C	
Absolute stability over 30 minutes	Dry Block Bath	±0.03°C
	Stirred Liquid Bath	±0.025°C
	Blackbody Source	±0.3°C
	Surface Sensor Calibrator	±0.5°C
	ITS-90 Fixed Point Apparatus	±0.0005°C
Computer Interface	Included with Software	
Cools from	250°C to Ambient in 25 minutes	
Heats from	Ambient to 250°C in 25 minutes	
Best Performance	See Graph	
Calibration volume	35mm diameter by 160mm deep	
Standard Insert	6 pockets, 9.5mm, 8.0mm, 6.4mm, 6.4mm, 4.5mm, 4.5mm, all 157mm deep	
Uniformity	±0.018°C	
Display Resolution	0.01	Up to 99.99
	0.1	100.0 to 250.0°C
		PC can display 0.01 across whole range with the software included
Indicator units	°C, °F, K	
Power	100 to 120V (50 / 60 Hz) or 200 to 240V (50 / 60 Hz) 300 Watts	
Overall dimensions	Height	302mm
	Width	176mm
	Depth	262mm
Weight	8kg	
How to Order	Calisto^{PLUS} 2250 Please specify model type required Please specify voltage required Please specify options required	

580 Oceanus-6PLUS

ISOCAL-6® Range



The Oceanus-6PLUS has all the advantages of the Isocal-6 models but with a substantially larger calibration volume, 52mm diameter by 300mm deep. The Oceanus-6 can be used as a Dry Block, a Liquid Bath, a Blackbody Source for infra red thermometers, a Surface Sensor Calibrator and for performance to a few mK (0.001°C) ITS-90 Fixed Points. The Oceanus-6PLUS is available in two models, the BASIC (B) and the SITE (S). The B model includes a sophisticated temperature controller with a dual display for Set Temperature and Dry Block Temperature, refer to page 27 for further details.

The S model includes a built in digital thermometer to which an external standard thermometer can be connected, for Dry Block use this will give greater accuracy eliminating temperature gradient and loading errors.

For Liquid Bath, Surface Sensor or Blackbody use an external thermometer should always be used - either with the S model or the B model and a separate stand-alone indicator. For Lab use the Oceanus-6PLUS can be used with a laboratory performance temperature indicator such as one of the Isotech True Temperature Indicators with performance, for similar sensors, down to hundredths of a degree. The Oceanus-6PLUS offers unprecedented accuracies of ±0.0002°C (2 Sigma) at the Water triple point and the Gallium melt temperature of 29.7646°C and up to ±0.005°C in the stirred liquid bath option (by comparison).

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±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 good absolute accuracy.

The S model has 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 on the inbuilt indicator. 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 Improved Temperature Range and the Site model can now be used with the supplied Cal Notepad software to test thermostats.

Key Features

- **S Model Includes Universal Input Temperature Indicator** allowing for up to five "correction" points to be programmed.
- **Realise ITS-90 Fixed Points -** the Oceanus-6PLUS can be used with the Gallium and Triple Point of Water Fixed Point Cells.
- **Calibrate as a Dry or Liquid Bath,** thermocouples, platinum resistance thermometers, thermistors, liquid in glass, thermostats, semiconductor types.
- **Windows Software and PC Interface as Standard.**
- **High Capacity Deep Block** 50mm diameter x 300mm Deep.
- **Use for Comparison and Fixed Point Calibration.**
- **Use with very long thermometers.**

Cells
Pages 24 - 25
Indicators
Pages 54 - 59
Probes
Pages 62 - 67
Software
Pages 74 - 79

580 Oceanus-6PLUS

ISOCAL-6® Range

Options

1.	Metal Block Insert	580-06-03	Standard Insert *Included*
		580-06-04	Blank Insert *Insert without pockets for local machining*
		580-06-05	Special Insert *Contact Isotech with your requirements*
		580-06-06	Adjustable Equalising Block
2.	Stirred Liquid Bath	580-06-07	Includes a container, magnetic stirrer and probe guide
	Thermometer Support Kit	580-06-00	*Allows three thermometers to be suspended in the bath, including liquid in glass types*
	C20 Oil	936-06-07	1 Litre (-35°C to +140°C)
4.	Blackbody Target	580-02-12	Use with Standard Probe (935-14-85)
5.	Surface Sensor Kit	580-06-08	Includes an Insert and angled thermocouple
6.	ITS-90 Fixed Point	B12/46 17401	Water Triple Point Cell Gallium Cell
UKAS Calibration		UKAS Calibration available to Order	
Standard Probe		935-14-85	Platinum Resistance Thermometer for use up to 250°C
Carrying Case		931-22-58	Large sturdy case accommodates the unit with room for accessories

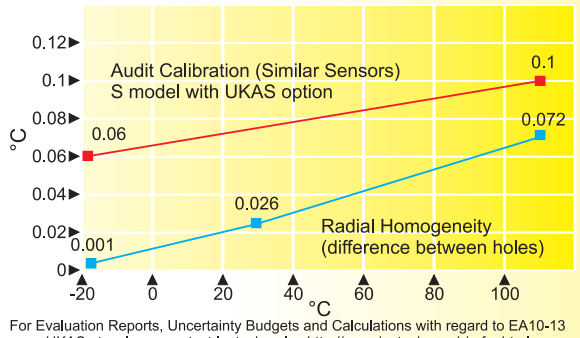
To see the ISOCAL-6 in use ask for our 27 minute video supplied on CD-Rom

Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

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 580 Oceanus-6PLUS meets the Calibration Capacity requirements of EA I0/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

580 OCEANUS-6 Performance

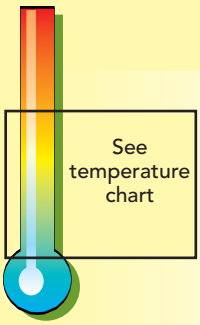


For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	OCEANUS-6	
Temperature Range	45°C below ambient to +140°C	
Absolute stability over 30 minutes	Dry Block Bath	±0.03°C
	Stirred Liquid Bath	±0.025°C
	Ice/Water Bath	±0.001°C
	Blackbody Source	±0.03°C
	Surface Sensor Calibrator	±0.5°C
	ITS-90 Fixed Point	±0.0002°C
Computer Interface	Included with Software	
Cools from	20°C to -10°C in 90 minutes	
Heats from	-10°C to 80°C in 60 minutes	
Best Performance	See Graph	
Calibration volume	50mm diameter by 300mm deep	
Standard Insert	6 pockets, all 8.0mm diameter and 250mm deep	
Display Resolution	0.01	-19.99 to 99.99
	0.1	100.0 to 140.0
		PC can display 0.01 across whole range with the software included
Indicator units	°C, °F, K	
Power	108 to 130V (50 / 60 Hz) or 208 to 240V (50 / 60 Hz) 300 Watts	
Overall dimensions	Height	430mm
	Width	310mm
	Depth	300mm
Weight	17kg	
How to Order	Oceanus PLUS 580 Please specify model type required Please specify voltage required Please specify options required	

Slim Fixed Point Cells

Proven Quality



The International Temperature Scale of 1990 applies World-wide; it includes specified fixed points - fundamental constants of nature. The majority of which relate to the freezing point of a pure substance, e.g. Pure Aluminium freezes at 660.3230°C. These standards are generally kept by Primary and National Laboratories. Isotech's Databook 1 includes these Primary Standards and associated equipment. Databook 2 includes a range of more affordable fixed points that are used in Secondary Laboratories and for extreme accuracy industrial calibration.

Many of the products featured in this Databook can be used with Fixed Point Cells enabling a modestly conceived industrial laboratory to be upgraded if and as the requirements arise. These Fixed Points are called *Slim Cells* because they are somewhat smaller than the cells normally used for Primary Standards.

These more economic cells are available in a number of constructions including metal clad as well as quartz glass clad cells. The metal cells are pure to 6N, 99.9999% pure and are sealed with 99.9999% pure argon at one atmosphere.

The Water Triple Point is perhaps the most important of the fixed points and there is a choice of two models, the smaller for the ISOCAL-6 Range, and the larger cell for the Oceanus-6.

The table opposite shows the Slim Cells available for the products in this databook. For further information relating to fixed point calibration please refer to Databook 1, Databook 2 and visit our web-site.

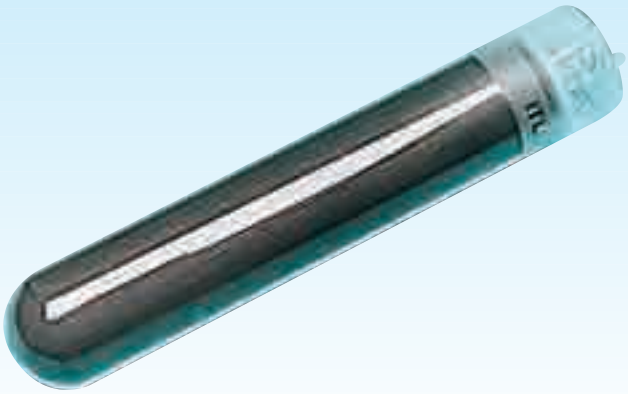
Isotech's Slim Fixed Point Cells can be used to calibrate temperature sensors, either as the metal within them melts, or as it freezes. Typically, says CCT/96-8, a 6N pure cell will melt over 80% of its plateau within ±1mK. Exceptionally Isotech's Gallium Cell will melt over ±0.2mK.

Allowance must be made for the sensor being calibrated, sensors with short sensing lengths will add no additional errors to the above but other types with longer sensing lengths will add additional uncertainties. An article is available from Isotech detailing stem conduction errors, please ask for your copy, free with our compliments.

Two examples showing the cell/apparatus/sensor performance are illustrated on the facing page.

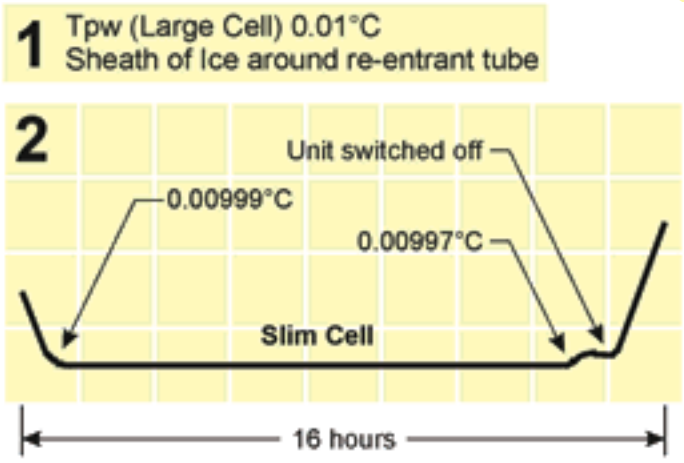
Key Features

- **Affordable solution for extreme accuracy Industrial calibration.**
- **6N (99.9999%) purity metals.**
- **Sealed with 6N (99.9999%) pure argon at the freeze temperature.**
- **Smaller versions of ITS-90 optimal Fixed Points.**
- **Ideal for shorter sensors.**
- **10 years of proven history of use in many laboratories throughout the World.**

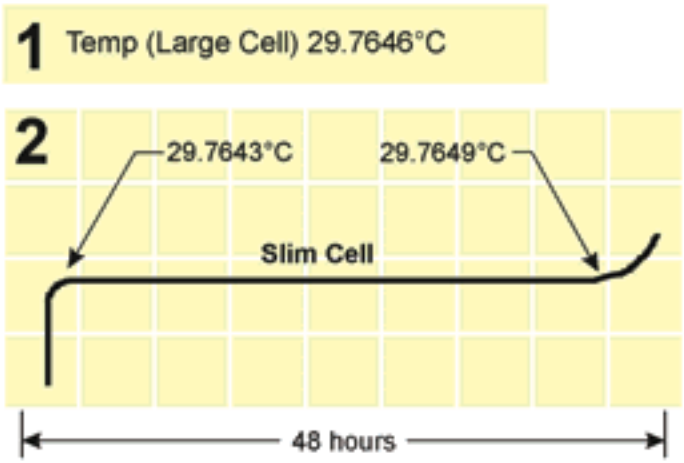


Slim Fixed Point Cells

Proven Quality



The graph shows a Standard Platinum Resistance Thermometer's temperature firstly as measured in a 2 week old large Water Triple Point Cell and then as measured in a Slim Cell placed in an Isotech metal block bath such as Europa-6 or Venus 2140. After 16 hours the apparatus was switched off (we wanted to go home).



The graph shows a Standard Platinum Resistance Thermometer's temperature firstly as measured in a large 7N pure Gallium Cell and then as recorded in a Slim Gallium Cell placed in an Isotech metal block bath such as Europa-6 or Venus 2140.

Cell	*Temperature ITS-90 Value (°C)*	*Length Immersed (mm) (1) (2)*	*Uncertainty*	*Type*	*Apparatus*	*Model Number*
Mercury	-38.8344°C	130	±0.001°C	Metal Clad	Europa-6	17724 Slim
Water	0.01°C	130	±0.001°C	Glass	Europa-6 Venus 2140	B8
Water	0.01°C	260	±0.001°C	Glass	Oceanus-6	B12/46
Gallium	29.7646°C	250	±0.001°C	Metal Clad	Oceanus-6	17401
Gallium	29.7646°C	140	±0.001°C	Metal Clad	Europa-6 Venus 2140 Calisto 2250	17401 Slim
Indium	156.5985°C	140	±0.001°C	Metal Clad	Medusa	17668M Slim
Tin	231.928°C	140	±0.002°C	Metal Clad	Medusa	17669M Slim
Lead	327.462°C	140	±0.010°C	Metal Clad	Medusa	17670M
Zinc	419.527°C	140	±0.005°C	Metal Clad	Medusa	17671M Slim
Aluminium	660.323°C	140	±0.010°C	Metal Clad	Oberon / Medusa 3	17672M Slim
Silver	961.78°C	140	(3)	Quartz Clad	Oberon	17673 Slim
Gold	1064.78°C	140	(3)	Quartz Clad	See Databook 2 Model 469	17675 Slim
Copper	1084.62°C	140	(3)	Quartz Clad	See Databook 2 Model 469	17674 Slim

(1) Depth from metal surface to the bottom of the re-entrant quartz tube
(2) Immersion errors depend on total depth of immersion in the apparatus which for Oceanus, Medusa and Oberon is 300mm, for Europa is 160mm.
Please ask for a free article titled 'Depth of Immersion Errors' for more details.
(3) Please consult Isotech.

How to Order Slim Cells
Please state Type and Model Number

Dry Block Calibrators

Introduction to Dry Block Calibration

Isothermal Technology manufacture a full range of temperature calibration equipment for Primary Standards used in National and Primary Labs, for Secondary Lab Equipment used in accredited calibration laboratories and through to the Dry Blocks featured here. Customers include the worlds largest Primary Standards Laboratories, Accredited Laboratories (UKAS, DKD etc), large multinational companies, research organisations, manufacturing etc. Eighty percent of Nations rely on Isotech to supply their country's standards. This is not a responsibility taken lightly and Isotech constantly invests in its own full scale UKAS (formerly NAMAS) accredited laboratory. Isotech issues UKAS certificates for fixed point cells, thermometers, indicators and dry blocks. Isotech have issued several thousand calibration certificates and carried out several thousand measurements on Dry Blocks. We calibrate all types, not just our own.

The benefit of this experience, and the knowledge of years of manufacturing Dry Blocks is invested back into these products with the goal of constant improvement. In recent years the number of producers of Dry Blocks has increased dramatically, whilst many look similar (and some look surprisingly similar to our established models) they are often very different inside and can perform very badly.

The Dry Block Calibrators complement with the ISOCAL-6 range. Above temperatures of approximately 250°C it is not practical to use stirred liquids due to fumes, risk of ignition and safety considerations.

Isotech's higher temperature calibration baths incorporate as many of the Isocal-6 options as is safe and practical to provide.

Dry Block Check List Before you purchase check:-

1 - Does the Producer Have an Accredited Laboratory?

UKAS accreditation, "is the means by which, in the public interest, the integrity and competence of independent evaluators is confirmed and declared". Isotech can issue a UKAS certificate with the performance expressed in the manner that you will need, not to some confusingly expressed specification that is made with no confirmation of integrity and competence.

2 Experience

Does the producer have experience? Do they understand the difference between accuracy and uncertainty? Can they tell you how to calculate the uncertainty of a probe being calibrated in the block? Isotech can.

3 Expandable

Can the Dry Block be used with other sensors? Are there accessories available for future expansion? With Isotech products they are.

4 - PC Support

Can it be connected to a computer? Is there software available, can it be automated? Isotech Dry Block Calibrators have a range of software options.

5 - Documented

Is the bath fully documented? Can you download a full evaluation report from the Web Site? Does it come with a comprehensive handbook and tutorial? Is training available? Isotech provide all of these free of charge.

6 Practical

Isotech Dry Blocks are practically designed with a strong metal case, and are a compact portable size. If you are going to carry it around don't forget to check the size and weights. It is surprising how large some other blocks are, even though they take the same number of probes. Beware if the specification does not include the weight.

7 Value

Check the prices, all the above come at an amazingly competitive price if you buy from Isotech.

New Features

Isotech Dry Block Calibrators, Portable Liquid Baths and Isocal-6 models now include updated electronic instrumentation.

- Unit Selection - choose from °C, °F or K.
- Thermostat Testing - The SITE models can now test thermostats with or without a PC - on contact close the indicator display is frozen.
- Tactile Keys.
- Scrolling Text Messages, such as "Heating to Temperature" and "Cooling to Temperature".
- New PC Software - Cal Notepad Version 3.0

Dry Block Calibrators

Introduction to Dry Block Calibration

Improvements

New in this Databook are the PLUS models. Isotech worked with a world leader in temperature control technology to develop easy to use Dry Block controllers and Indicators. Now Isotech plug-in controllers are exceptionally easy to use with a clear user interface. Power feedback is used to stabilise against supply voltage changes, a digital filter circuit ensures high integrity of measurement without drift, rejecting 50/60Hz pick up and filtering out other sources of noise. Resolution is increased. The indicators have universal thermocouple inputs and we have added a PC interface and software as standard. Check the individual models for full details. Windows software is now provided as standard, with expandable options to calibrate up to 16 sensors at a time. The new I-CAL software can event capture images for automatic calibration of hand-helds etc.

Inbuilt Indicator

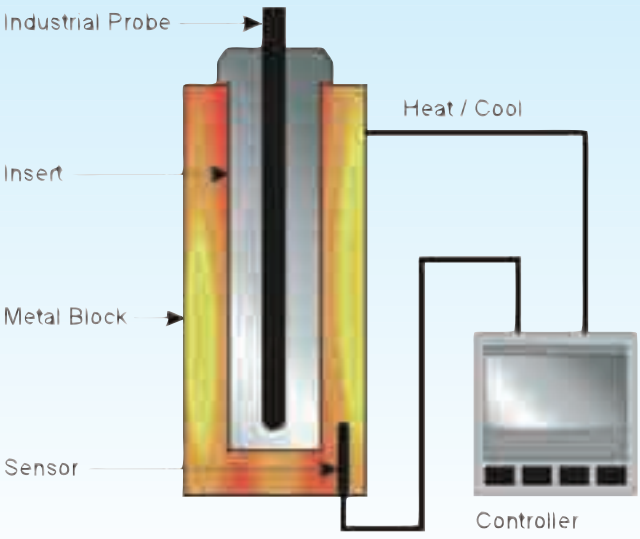
The SITE (S) models include an electronic temperature indicator that can be used with a 100Ω Resistance Thermometer, Thermocouples, (K, N, R, S, L, B, PL2, T, J and E) and DC process inputs including 4-20mA current transmitters . A reference thermometer can be connected or for complete flexibility the in-built indicator can be used to show the value from a sensor being calibrated.

Using Isotech's Dry Blocks Traceable Calibration

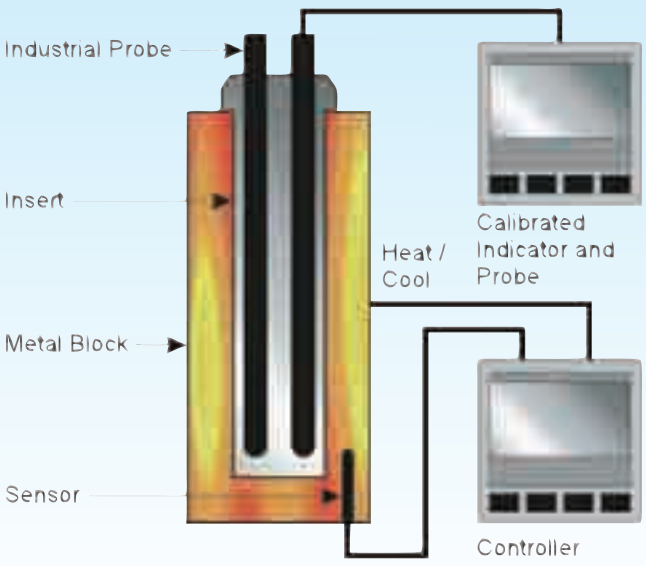
For best practice the recommendation is that a calibrated probe is placed into the Dry Block Insert and the thermometers under test *"can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons"*. Thus meeting many quality systems including requirements of ISO 9000.

Using the Dry Bock itself as the Reference (or standard) raises a number of issues, such as how is the uncertainty of the Dry Block calculated. In practice, it can vary significantly, and there are some poor designs from many suppliers where it is not possible to achieve this in a satisfactory manner. Recently, International Guidelines have been published from the EA (European co-operation for Accreditation) that give guidance, and requirements, for the calibration of Dry Blocks (EA10-13). For the most demanding applications we continue to recommend that a reference probe is used, the same method as used in secondary temperature laboratories, but for less demanding calibration, and the quick testing of sensors the Dry Block can be used without a reference probe, refer to the Dry Block's Evaluation Report for typical performance.

Metal Block Calibrator of Poor Design

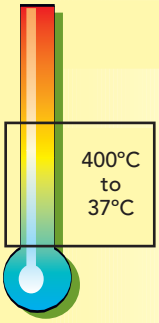


Metal Block Calibrator Meeting ISO9000 Requirements



Apollo 1 & 2

Dry Block Calibrator



The Apollo Dry Block range offer a complete self contained and simple solution for the checking and calibrating of temperature sensors. The sensors under test are placed in the large block and one of the five preset temperatures is selected, the temperature from the sensor is then recorded against the value from the Apollo's UKAS (formerly NAMAS) Calibration Certificate. This calibration certificate is included as standard. The moderate temperature range, deep immersion depth and fixed block allow it to be issued without the need for an external standard.

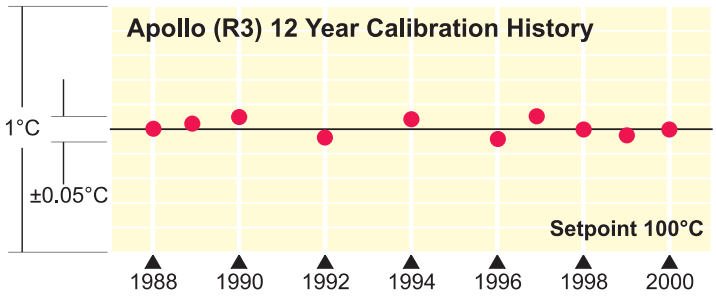
The Apollo is widely used as a reference standard in hospitals, local government and food industries etc. The Apollo has been developed from Isotech's very first dry block and has a long history of successful use. See the calibration history chart of a typical bath.

The block has four 8mm pockets and four 19.5mm pockets all 160mm deep.

The Apollo can be provided with customer selected temperatures in addition to the two standard models which have the following temperatures preset.

Apollo 1	37°C	65°C	100°C	121°C	130°C
Apollo 2	100°C	150°C	200°C	250°C	300°C

This graph shows the actual calibration history over 12 years of an Apollo, the deviation over 12 years is ±0.05°C and all values fall comfortably within the uncertainty band, 0.15°C



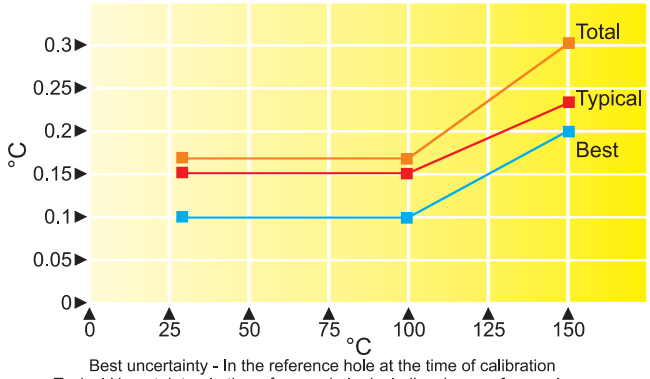
Key Features

- **Easy to use temperature reference, self contained no further equipment necessary.**
- **High Capacity Block.**
- **Gold Plated Selector Switch.**
- **Exceptionally Low Drift.**
- **Includes UKAS Certificate as Standard.**
- **Option for customer specified preset temperatures in the range 35°C to 400°C.**

Apollo 1 & 2

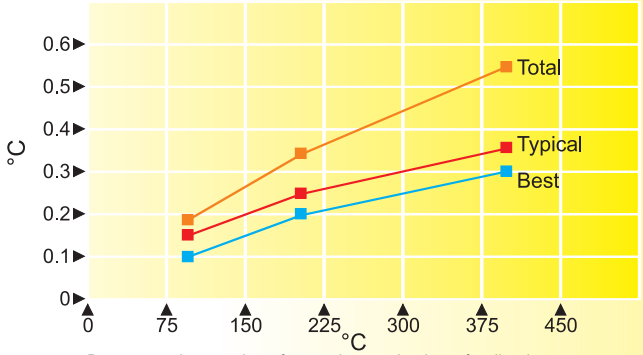
Dry Block Calibrator

APOLLO 1 UNCERTAINTY



Best uncertainty - In the reference hole at the time of calibration
Typical Uncertainty - In the reference hole, including 1 year of normal use
Total uncertainty - In the other 8mm diameter holes, including 1 year of normal use

APOLLO 2 UNCERTAINTY



Best uncertainty - In the reference hole at the time of calibration
Typical Uncertainty - In the reference hole, including 1 year of normal use
Total uncertainty - In the other 8mm diameter holes, including 1 year of normal use

Options

Customer Specified Temperatures		Select Five Points between 35 and 400°C
	Point	Nominal Temperature Value
	1.	
	2.	
	3.	
	4.	
	5.	

Carrying Case	931-22-64	Sturdy case accommodates the unit with room for accessories

Calibration and Uncertainty

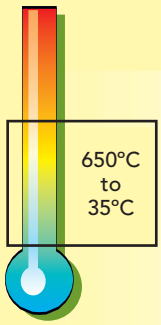
A UKAS calibration certificate is included as standard.

The Apollo meets the Calibration Capacity requirements of EA-10/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

Model No.	APOLLO 1 & APOLLO 2	
Temperature Range	APOLLO 1 APOLLO 2	37, 65, 100, 121, 130°C 100, 150, 200, 250, 300°C
Absolute stability over 30 minutes	At 100°C	±0.02°C
Cools from	Apollo 1	Apollo 2
130°C to 65°C	70 minutes	N/A
300°C to 100°C	N/A	160 minutes
Heats from	Apollo 1	Apollo 2
37°C to 130°C	20 minutes	N/A
100°C to 300°C	N/A	30 minutes
Uncertainties	Refer to Uncertainties Graph	
Calibration volume	Four 8mm pockets, 160mm deep and four 19.5mm pockets, 160mm deep	
Display	LED indicator of	At Temperature Under Temperature and Over Temperature
Power	100 to 120V (50 / 60 Hz) or 200 to 240V (50 / 60 Hz) 500 Watts	
Overall dimensions	Height Width Depth	302mm 176mm 262mm
Weight	Apollo 1 Apollo 2	9.5kg 9.5kg
How to Order	Apollo 1 or Apollo 2 Please specify model type required Please specify voltage required Please specify options required	

Jupiter^{PLUS} 650

Dry Block Calibrator



The Jupiter^{PLUS}650 Dry Block range offers industry-leading performance in an easy to use portable package - ideal for the calibration of thermocouples and platinum resistance thermometers. It has been designed for fast heating and cooling for convenient field use. For flexibility surface sensor and infrared thermometer accessories can be added.

The standard insert can hold up to six thermometers. For larger blocks see the Gemini and Medusa models. The Jupiter^{PLUS}650 is available in two models, the BASIC (B) and the SITE (S). The B model includes a sophisticated temperature controller with a dual display for Set Temperature and Dry Block Temperature.

The S model includes a built in digital indicator to which an external standard thermometer can be connected giving greater accuracy eliminating temperature gradient and loading errors. For Surface Sensor and Blackbody use an external thermometer should always be used. For lab accuracy the Jupiter^{PLUS}650 can be used with a high-end temperature indicator such as one of the Isotech True Temperature Indicators (TTI).

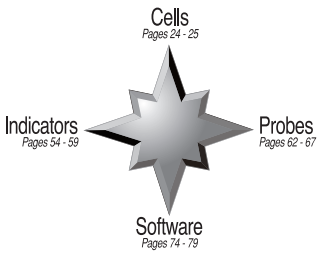
Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±0.01 available throughout the range via the PC interface and from 0.01 to +99.99 locally on the auto-ranging front display. The controller features multi-point block to display correction giving good absolute accuracy.

The S model has 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 on the inbuilt indicator. 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

- **Calibrate Whole Calibration Loop -** using a heat source rather than an electrical simulator a test instrument and probe can be calibrated as a system.
- **Good Temperature Uniformity**
  Careful design and research allows use of a high conductivity heater block to give the best temperature uniformity.
- **Wide Operating Range**
  Fast response from 35°C to 650°C ideal for field use.
- **Simple To Use -** Outstanding Value for Money!
- **S 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.isotech.co.uk/industrial.



Jupiter^{PLUS} 650

Dry Block Calibrator

Options

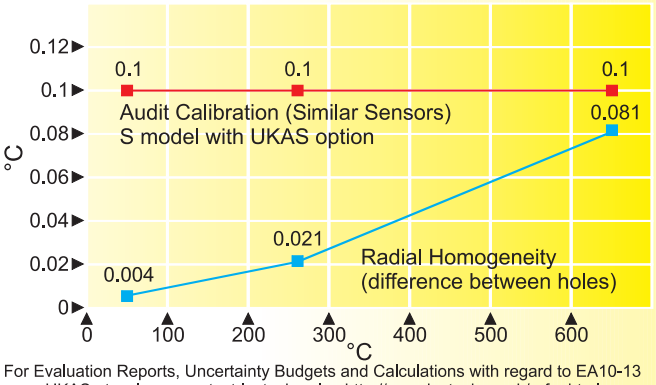
Metal Block Insert 	852-07-11	Standard Insert *Included*
	852-07-07	Blank Insert *Insert without pockets for local machining*
	852-07-07C	Special Insert *Contact Isotech with your requirements*
Alternative Metal Block Inserts		
	852-09-03	Standard Insert type B 13mm , 10mm, 8mm, 5mm and 3.5mm diameter holes, all 140mm deep
	852-09-04	Special Insert type C 8mm, 6 x 6.5mm diameter holes, all 140 deep
Blackbody Kit	852-09-05	Includes a Blackbody target and Sensor
Surface Sensor Kit	852-07-15	Includes an Insert and angled thermocouple
UKAS Calibration	UKAS Calibration available to Order	
Air Cooling	853-04-02	For use with a compressor this accessory allows air to be blown into the block for rapid cooling.
Standard Probe	935-14-72	Platinum Resistance Thermometer for use up to 650°C
Carrying Case	931-22-64	Sturdy case accommodates the unit with room for accessories

Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

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 Jupiter^{PLUS} 650 meets the Calibration Capacity requirements of EA I0/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

JUPITER^{PLUS}650 Performance

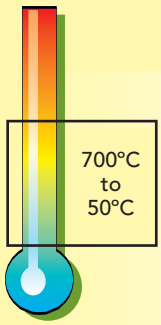


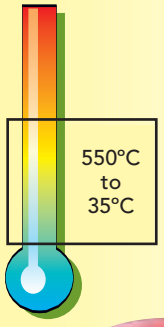
For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	JUPITER^{PLUS} 650	
Temperature Range	35°C to 650°C	
Absolute stability over 30 minutes	At 50°C	±0.02°C
	At 250°C	±0.02°C
	At 650°C	±0.03°C
	Blackbody Source	±0.3°C
	Surface Sensor Calibrator	±0.5°C
Computer Interface	Included with Software	
Cools from	650°C to 150°C in 60 minutes	
Heats from	30°C to 650°C in 20 minutes	
Best Performance	See Graph	
Calibration volume	35mm diameter by 148mm deep	
Standard Insert	6 pockets, 2 x 4.5mm, 2 x 6.4mm, 1 x 8.0mm, 1 x 9.5mm diameter, all 140mm deep	
Display Resolution	0.01 to 99.99	
	0.1 100.0 to 650.0	
	PC can display 0.01 across whole range with the software included	
Indicator units	°C, °F, K	
Power	100 to 120V (50 / 60 Hz) or	
	200 to 240V (50 / 60 Hz)	
	1000 Watts	
Overall dimensions	Height	302mm
	Width	176mm
	Depth	262mm
Weight	8.5kg	
How to Order	Jupiter^{PLUS} 650	
	Please specify model type required	
	Please specify voltage required	
	Please specify options required	

Gemini^{PLUS} 550/700

Dry Block Calibrator





The Gemini^{PLUS} Dry Block range offers industry-leading performance in an easy to use portable package - ideal for the calibration of thermocouples and platinum resistance thermometers. It has been designed to have a large block suitable for more probes, or larger probes than can be accommodated in the Jupiter and Calisto models.

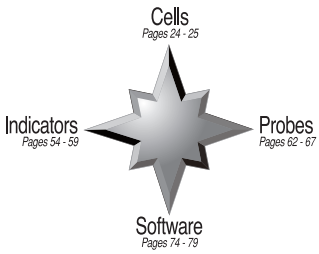
The Gemini^{PLUS} is available with a fixed block with 8 pockets or with a large removable block, see Gemini LRI overleaf. The Gemini^{PLUS} is available in two models, the BASIC (B) and the SITE (S). The B model includes a sophisticated temperature controller with a dual display for Set Temperature and Dry Block Temperature. The large block has the benefit of higher capacity but with longer heating and cooling times compared to the fast response models such as the Jupiter 650.

The S model includes a built in digital indicator to which an external standard thermometer can be connected giving greater accuracy eliminating temperature gradient and loading errors. For lab accuracy the Gemini^{PLUS} can be used with a high-end temperature indicator such as one of the Isotech True Temperature Indicators (TTI).

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±0.01 available throughout the range via the PC interface and from 0.01 to +99.99 locally on the auto-ranging front display. The controller features multi-point block to display correction giving good absolute accuracy.

The S model has 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 on the inbuilt indicator. 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

- **Calibrate Whole Calibration Loop -** using a heat source rather than an electrical simulator a test instrument and probe can be calibrated as a system.
- **High Capacity Block -** Large Calibration volume for many sensors and low loading errors.
- **Two Operating Ranges -** Fast response from 35°C to 550°C or 50°C to 700°C.
- **Simple To Use -** Outstanding Value for Money!
- **S 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.isotech.co.uk/industrial

Gemini^{PLUS} 550/700

Dry Block Calibrator

Options

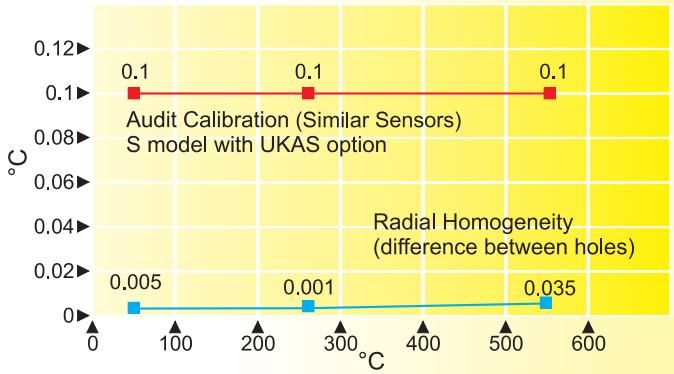
Metal Block Sleeves Gemini^{PLUS} 550	Please specify	Set of four Sleeves to suit the block. Optional single hole sizes 4, 6, 8, 10, 12, 14mm diameter all 150mm deep.
	857-07-01	Undrilled sleeves for local machining
	857-07-03	1 sleeve with 2 holes 4.5mm x 150mm deep
Gemini^{PLUS} 700	Please specify	Set of four Sleeves to suit the block. Optional single hole sizes 4, 6, 8, 10, 12, 14mm diameter all 150mm deep
	857-07-02	Undrilled sleeves for local machining
	857-07-04	1 sleeve with 2 holes 4.5mm x 150mm deep
Note: The use of sleeves will introduce an additional thermal gradient into the block. This can be avoided by using the LRI model with a block drilled for specific probes		
UKAS Calibration	UKAS Calibration available to Order	
Standard Probe	935-14-72	Platinum Resistance Thermometer for use up to 650°C
	935-14-63	Type N Thermocouple for use up to 700°C
Carrying Case	931-22-64	Sturdy case accommodates the unit with room for accessories

Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

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 Gemini^{PLUS} 550/700 meets the Calibration Capacity requirements of EA I0/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

GEMINI^{PLUS}550 Performance

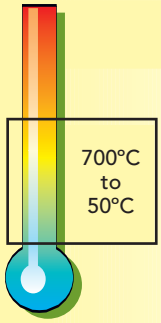


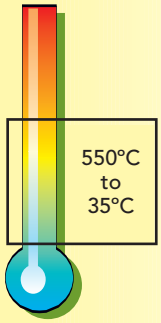
For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	GEMINI^{PLUS} 550 / 700	
Temperature Range	GEMINI^{PLUS} 550 GEMINI^{PLUS} 700	35°C to 550°C 50°C to 700°C
Absolute stability over 30 minutes	At 35°C At 275°C At 550°C At 700°C	±0.05°C ±0.05°C ±0.05°C ±0.05°C
Computer Interface	Included with Software	
Cools from 550°C to 275°C 550°C to 60°C	Gemini^{PLUS} 550 35 minutes 345 minutes	
Heats from 30°C to 550°C 50°C to 700°C	Gemini^{PLUS} 550 35 minutes N/A	Gemini^{PLUS} 700 N/A 110 minutes
Best Performance	See Graph	
Calibration volume Standard Block	Four 8mm pockets, four 19.5mm pockets, all 160mm deep	
Display Resolution	0.01 to 99.99 0.1 100.0 to 700.0 PC can display 0.01 across whole range with the software included	
Indicator units	°C, °F, K	
Power	100 to 120V (50 / 60 Hz) or 200 to 240V (50 / 60 Hz) 600 Watts	
Overall dimensions	Height 302mm Width 176mm Depth 262mm	
Weight	Gemini^{PLUS} 550 Gemini^{PLUS} 700	8.5kg 14kg
How to Order	Gemini^{PLUS} 550 or Gemini^{PLUS} 700 Please specify model type required Please specify voltage required Please specify options required	

Gemini^{PLUS} 550/700 LRI

Dry Block Calibrator





The Gemin^{PLUS} LRI (Large Removable Insert) Dry Block range offers industry-leading performance in an easy to use portable package - ideal for the calibration of thermocouples and platinum resistance thermometers.

It differs from the Gemini^{PLUS} models in that it has been designed to have a large *removable* block with eight 8mm pockets, supplied as standard. Alternatively a block can be custom drilled allowing many probes to be calibrated simultaneously without the need for inserts and ensuring excellent temperature uniformity.

Gemini^{PLUS} LRI is available in two models, the BASIC (B) and the SITE (S). The B model includes a sophisticated temperature controller with a dual display for Set Temperature and Dry Block Temperature. The large block has the benefit of higher capacity but with longer heating and cooling times compared to the fast response models such as the Jupiter 650.

The S model includes a built in digital indicator to which an external standard thermometer can be connected giving greater accuracy eliminating temperature gradient and loading errors. For lab accuracy the Gemini^{PLUS} LRI can be used with a high-end temperature indicator such as one of the Isotech True Temperature Indicators (TTI).

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±0.01 available throughout the range via the PC interface and from 0.01 to +99.99 locally on the auto-ranging front display. The controller features multi-point block to display correction giving good absolute accuracy.

The S model has 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 on the inbuilt indicator. 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

- **Calibrate Whole Calibration Loop -** using a heat source rather than an electrical simulator a test instrument and probe can be calibrated as a system.
- **High Capacity Insert -** Large removable insert can hold many sensors simultaneously.
- **Custom Inserts Available -** Inserts can be drilled to customer specifications to hold many sensors without the need for packing sleeves or inserts.
- **Simple To Use -** Outstanding Value for Money!
- **S 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.isotech.co.uk/industrial

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Gemini^{PLUS} 550/700 LRI

Dry Block Calibrator

Options

Removable Inserts Gemini^{PLUS} 550 LRI	976-07-01a	Included as Standard *Removable insert with eight 8mm pockets*
	976-07-01b	Blank Insert *Insert without pockets for local machining*
	976-07-01c	Special Insert *Contact Isotech with your requirements*
Gemini^{PLUS} 700 LRI	976-07-02a	Included as Standard *Removable block with eight 8mm pockets*
	976-07-02b	Blank Insert *Insert without pockets for local machining*
	976-07-02c	Special Insert *Contact Isotech with your requirements*

UKAS Calibration	UKAS Calibration available to Order

Standard Probe	935-14-72	Platinum Resistance Thermometer for use up to 650°C
	935-14-63	Type N Thermocouple for use up to 700°C

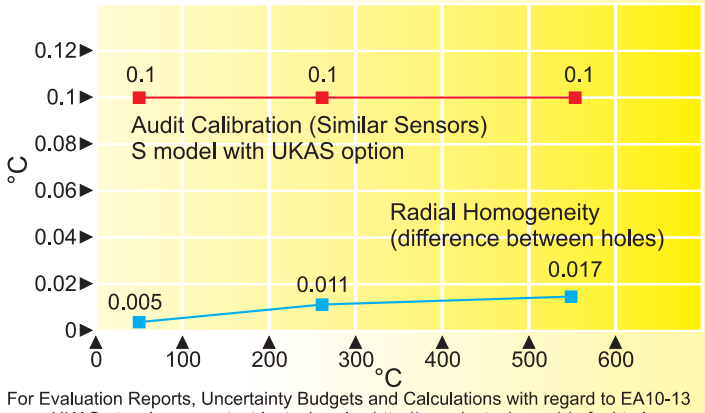
Carrying Case	931-22-65	Sturdy case accommodates the unit with room for accessories

Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

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 Gemini^{PLUS} 550/700 LRI meets the Calibration Capacity requirements of EA I0/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

GEMINI^{PLUS} 550 LRI Performance

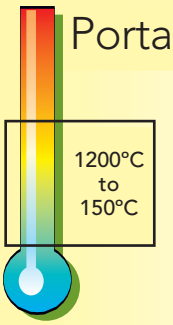


For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	GEMINI^{PLUS} 550 / 700 LRI	
Temperature Range	GEMINI^{PLUS} 550 LRI GEMINI^{PLUS} 700 LRI	35°C to 550°C 50°C to 700°C
Absolute stability over 30 minutes	At 35°C At 250°C At 550°C At 700°C	±0.02°C ±0.03°C ±0.04°C ±0.05°C
Computer Interface	Included with Software	
Cools from 550°C to 275°C 550°C to 60°C	Gemini^{PLUS} 550 132 minutes 420 minutes	
Heats from 30°C to 550°C 50°C to 700°C	Gemini^{PLUS} 550 60 minutes N/A	Gemini^{PLUS} 700 N/A 120 minutes
Best Performance	See Graph	
Calibration volume	64mm diameter by 160mm deep	
Standard Insert	Eight 8mm diameter pockets all 154mm deep	
Display Resolution	0.01 to 99.99 0.1 100.0 to 700.0 PC can display 0.01 across whole range with the software included	
Indicator units	°C, °F, K	
Power	100 to 120V (50 / 60 Hz) or 200 to 240V (50 / 60 Hz) 1000 Watts	
Overall dimensions	Height 302mm Width 176mm Depth 262mm	
Weight	Gemini^{PLUS} 550 Gemini^{PLUS} 700	8.5kg 18kg
How to Order	Gemini^{PLUS} 550 or Gemini^{PLUS} 700 Please specify model type required Please specify voltage required Please specify options required	

Pegasus^{PLUS} 1200

Portable Calibration Furnace



The Pegasus^{PLUS} range offers extreme high temperature calibration in an easy to use portable package - ideal for the calibration of high temperature thermocouples. It has been designed for fast heating and finds applications in the glass, electrical power, automotive and material processing industries. A Blackbody target can be added for the calibration of infrared thermometers.

The standard insert has four 8mm pockets 80mm deep. The metal insert is strategically placed beneath 50mm of insulation to provide optimal performance over the radiant temperature range. For larger blocks see the Oberon model. The Pegasus is available in two models, the BASIC (B) and the SITE (S). The B model should be used with an external reference probe and indicator, such as the TTI 7. The thermocouples under test should be calibrated by *comparison* to the external probe.

The S model includes a built in digital indicator to which an external standard thermometer should be connected, giving greater accuracy eliminating temperature gradient and loading errors. The recommended probe is a platinum Type R thermocouple. The optional Blackbody target is used with a specially angled Type R thermocouple that sits immediately behind the target area.

Includes as standard: Windows Software and a Computer Interface. Increased resolution of ±0.1 available throughout the range via the PC interface and from 150.0 to 999.9 locally on the auto-ranging front display. The controller features multi-point block to display correction giving good absolute accuracy.

The S model has 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 on the inbuilt indicator. 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

- **Calibrate Whole Calibration Loop -** using a heat source rather than an electrical simulator a test instrument and probe can be calibrated as a system.
- **Custom furnace design -** provides fast heating with optimised thermal profile.
- **High Operating Range**
  Portable field use up to 1200°C.
- **Simple To Use -** Outstanding Value for Money!
- **S 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.isotech.co.uk/industrial

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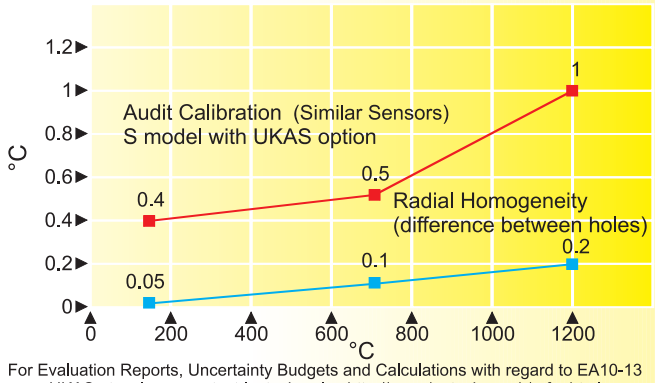
Pegasus^{PLUS} 1200

Portable Calibration Furnace

Options

Metal Block Insert 	853-06-01	Standard Insert *Included*
	853-06-02	Blank Insert *Insert without pockets for local machining*
	853-06-02b	Special Insert *Contact Isotech with your requirements*
Blackbody Kit	853-06-03	Includes a Blackbody target and Sensor *The Pegasus 1200 has to be used with the target vertical. Databook 4 includes the Pegasus 1200R which is suitable for horizontal operation*
UKAS Calibration		UKAS Calibration available to Order (S models only)
Air Cooling	853-04-02	For use with a compressor this accessory allows air to be blown into the block for rapid cooling.
Ceramic Insulators	853-06-04	Spare insulation pack Includes 2 x standard tops and 2 x standard bottoms
Standard Probe	935-14-91	Type R Platinum Thermocouple for use up to 1200°C
Carrying Case	931-22-64	Sturdy case accommodates the unit with room for accessories

Pegasus^{PLUS} 1200 Performance



For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	PEGASUS^{PLUS} 1200	
Temperature Range	150°C to 1200°C	
Absolute stability over 30 minutes	At 150°C At 1200°C Blackbody Source	±0.1°C ±0.2°C ±0.3°C
Computer Interface	Included with Software	
Cools from	1200°C to 800°C in 50 minutes* 1200°C to 200°C in 180 minutes* *substantially reduced by the cooling adaptor	
Heats from	100°C to 1200°C in 20 minutes	
Best Performance	See Graph	
Calibration volume	33.5mm diameter by 130mm deep	
Standard Insert	4 pockets, 8.0mm diameter by 80mm deep	
Display Resolution	0.1 to 999.9 1 1000 to 1200 PC can display 0.1 across whole range with the software included	
Indicator units	°C, °F, K	
Power	100 to 120V (50 / 60 Hz) or 200 to 240V (50 / 60 Hz) 2300 Watts	
Overall dimensions	Height Width Depth	302mm 176mm 262mm
Weight	8.5kg	
How to Order	Pegasus^{PLUS} 1200 Please specify model type required Please specify voltage required Please specify options required	

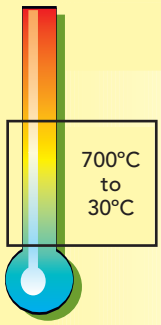
Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

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 Pegasus^{PLUS} 1200 meets the Calibration Capacity requirements of EA I0/13, "EA Guidelines on the Calibration of Temperature Block Calibrators".

510 Medusa & 511 Medusa 3

Dry Block Calibrator



Isotech have a wide range of Dry Blocks to suit probes requiring a large immersion depth. These products feature large and deep calibration volumes. As such they are less portable then the earlier Dry Blocks in this databook but have higher capacities and retain outstanding temperature uniformity, this uniformity is so good that these larger products are also featured in DataBook 2 as apparatus for Secondary Laboratories to realize the Fixed Points of ITS-90.

Medusa 510 has a maximum operating temperature of 550°C. The Medusa 3 Model 511 can be used to 700°C and features three zone control. In addition to the main heating zone there are additional top and bottom heaters which compensate for the end losses creating a constant temperature zone across the well.

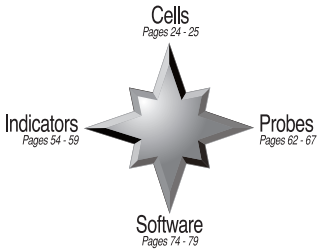
For Comparison Calibration the MedusaPLUS should be used with an insert, the standard insert has six 8mm pockets 250mm deep. Also available is an insert 44mm diameter x 170mm deep which is suspended from the top of the block so that the height is user adjustable. For flexibility the MedusaPLUS can also be used with accessories for infrared thermometers and surface sensors. The MedusaPLUS is available in two models, the BASIC (B) and the SITE (S). The B model includes a sophisticated temperature controller with a dual display for Set Temperature and Dry Block Temperature.

The S model includes a built-in digital thermometer to which an external standard thermometer can be connected giving greater accuracy, eliminating temperature gradient and loading errors. Also included in the Site model is a timer which can set the bath between two temperatures, and automate ITS-90 fixed point operation. For Surface Sensor and Blackbody use an external thermometer is recommended. For laboratory accuracy the MedusaPLUS can be used with a high-end temperature indicator such as an Isotech TTI model.

Includes as standard: Windows Software, Computer Interface and a Ramp to Set Point Feature. Increased resolution of ±0.01 available throughout the range via the PC interface and from 0.01 to +99.99 locally on the auto-ranging front display. The controller features multi-point block to display correction giving good absolute accuracy.

New in the S model is 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 on the in-built indicator. 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.



Fixed Point Cells Available

Material	*Temperature*	*Uncertainty*
Gallium	29.7646°C	±0.001°C
Indium	156.598°C	±0.001°C
Tin	231.928°C	±0.002°C
Zinc	419.527°C	±0.005°C
Lead	327.462°C	±0.010°C
Zinc	419.527°C	±0.005°C
Aluminium	660.323°C	±0.010°C

Key Features

- **High Capacity Deep Block**
  45mm diameter x 285mm Deep.
- **Use for Comparison and Fixed Point Calibration.**
- **Use with very long thermometers.**

510 Medusa & 511 Medusa 3

Dry Block Calibrator

Options

510 Metal Block Insert 	510-06-01	Standard Insert *Included*
	510-06-02	Blank Insert *Insert without pockets for local machining*
	510-06-03	Special Insert *Contact Isotech with your requirements*
	510-06-04	Adjustable Equalising Block

511 Metal Block Insert 	511-06-01	Standard Insert *Included*
	511-06-02	Blank Insert *Insert without pockets for local machining*
	511-06-03	Special Insert *Contact Isotech with your requirements*
	511-06-04	Adjustable Equalising Block

510 Blackbody Kit	510-06-05	Includes a Blackbody target and Sensor
511 Blackbody Kit	511-06-05	Includes a Blackbody target and Sensor

510 Surface Sensor Kit	510-06-06	Includes an insert and angled thermocouple
511 Surface Sensor Kit	511-06-06	Includes an insert and angled thermocouple

ITS-90 Fixed Points	ITL17401M	Gallium Slim Cell (510 only)
	ITL17668M	Indium Slim Cell
	ITL17669M	Tin Slim Cell
	ITL17670M	Lead Slim Cell
	ITL17671M	Zinc Slim Cell
	ITL17672M	Slim Aluminium Cell (511 only)
		Slim Cell Holder

UKAS Calibration	UKAS Calibration available to Order

Standard Probe	935-14-95	Platinum Resistance Thermometer for use up to 650°C

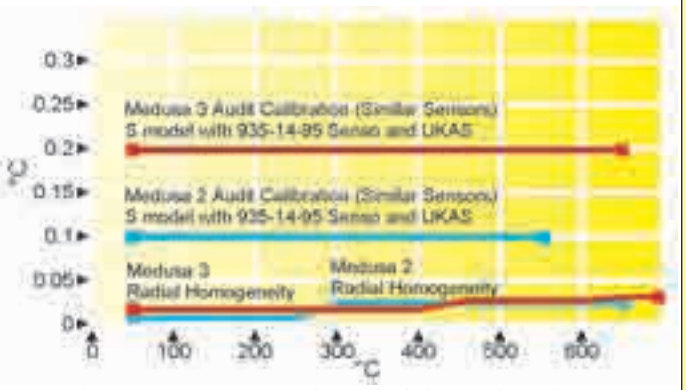
Carrying Case	931-22-58	Sturdy case accommodates the unit with room for accessories

Calibration and Uncertainty

A certificate, traceable to National Standards, is included as standard. Recommended is an optional UKAS five-point calibration.

The accuracy of the Medusa will depend very much on the mode of use, see the Uncertainty Graph for typical uncertainties. NTPL calculate the uncertainties to UKAS requirements. The Medusa meets the Calibration Capacity requirements of EA-10/13, "EA Guidelines on the Calibration of Temperature Block Calibrators."

510 Medusa^{PLUS} Performance

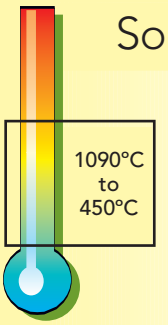


For Evaluation Reports, Uncertainty Budgets and Calculations with regard to EA 10-13 UKAS etc, please contact Isotech - also http://www.isotech.co.uk/refer.html

Model No.	510 MEDUSA^{PLUS}	511 MEDUSA 3
Temperature Range	30°C to 550°C	50°C to 700°C
Absolute stability over 30 minutes	Metal Block Bath ±0.03°C Blackbody Source ±0.1°C Surface Sensor Calibrator ±0.5°C ITS-90 Fixed Point ±0.001°C	
Computer Interface	Included with Software	
Cools from	550°C to 30°C in 5 hours	
Heats from	30°C to 550°C in 90 minutes	
Uncertainties	Refer to Uncertainties Graph	
Calibration volume	45mm diameter by 285mm deep	
Standard Insert	Six 8mm pockets all 250mm deep	
Display Resolution	0.01 to 99.99 0.1 100.0 to 650.0 PC can display 0.01 across whole range with the software included	
Indicator units	°C, °F, K	°C, °F, K
Power	100 to 120V (50 / 60 Hz) or 200 to 240V (50 / 60 Hz) 1000 Watts	108 to 130V (50 / 60Hz) or 208 to 240V (50 / 60Hz) 1800 Watts
Overall dimensions	Height 430mm Width 310mm Depth 300mm	Height 430mm Width 310mm Depth 300mm
Weight	17kg	25kg
How to Order	510 Medusa^{PLUS} or 511 Medusa 3 Please specify model type required Please specify voltage required Please specify options required	

426 Oberon

Sodium Heatpipe Furnace



Isotech has a wide range of Dry Blocks to suit probes requiring a large immersion depth. These products feature large and deep calibration volumes. As such they are less portable then the earlier Dry Blocks but have higher capacities and retain outstanding temperature uniformity, this uniformity is so good that these larger products are also featured in DataBook 2 as apparatus for Secondary Laboratories to realise the Fixed Points of ITS-90.

For comparison calibration the Oberon should be used with an insert. The insert has six pockets 8mm diameter by 160mm deep which is suspended from the top of the heatpipe so that the height is user adjustable. The shape of the cavity and its essentially gradient free temperature profile allow it to be used as a source for the calibration of infrared thermometers. See Databook 4 for details of Fixed Point Cells for calibration of infrared thermometers.

The Oberon uses a specially designed stress free isothermal heat-pipe as its furnace that ensures a very low thermal gradient along the furnace core.

The heat-pipe is designed so that the inner wall is not subject to thermal expansion stresses from the outer wall before the heat-pipe reaches conduction temperature. The working fluid is permanently and safely sealed within the plasma-arc welded enclosure.

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Fixed Point Cells Available

Material	*Temperature*	*Uncertainty*
Aluminium	660.323°C	±0.02°C
Silver	961.78°C	±0.04°C

Key Features

- **Uses a Heat-pipe to eliminate vertical temperature gradients.**
- **Use for Comparison and Fixed Point Calibration.**
- **Use with very long thermometers.**

426 Oberon

Sodium Heatpipe Furnace

Options

Metal Block Insert	426-06-05	Adjustable Equalising Block
ITS-90 Fixed Points	17672 Slim 17673 Slim 426-04-00	Aluminium Cell Silver Cell Slim Cell Holder
Transformer	935-19-43	230V/110V Transformer

Model No.	OBERON
Temperature Range	450°C to 1090°C
Absolute stability over 30 minutes	Metal Block Bath ±0.05°C Blackbody Source
Computer Interface	Included with Software
Display Resolution	0.1 to 999.9 PC can display 0.1 across whole range with the software included
Power	108 to 130V (50 / 60 Hz) 1000 Watts (230V Transformer available as an option)
Overall dimensions	Height 410mm Width 415mm Depth 280mm
Weight	30.5kg
How to Order	426 Oberon Please specify model type required Please specify options required

Fast Calibrators

Introduction to Fast Calibrators

This section focuses on the equipment needed for the rapid checking, testing and calibrating of instrumentation and temperature sensors. Service engineers and those working on site will appreciate the benefits of simple and fast temperature calibration. An engineer forced to carry a calibrator up a ladder or into a confined space will value the handheld QuickCal.

Included are three simulators, two for resistance thermometers and a thermocouple simulator. In use the simulator replaces the temperature sensor and the instrument can be rapidly calibrated by setting the simulator to have the same output as an RTD or thermocouple at a particular temperature.

The Products Featured in this section have:

- Outstanding Value
- Compact Size with true handheld models
- Wide Operating Ranges
- Fast Response

Quick-Cals

There are two Quick-Cal models, handheld, portable and capable of operating from -12°C to 350°C

Fast-Cals

FAST-CALs work from -35°C to 650°C in three ranges, -35°C to 140°C, 30°C to 350°C and 35°C to 650°C

During 2004 20 experienced engineers from many parts of the world specified their ideal products for Industrial Calibration. FAST-CAL realizes their top ten requirements of:

1. Rugged
2. Lightweight
3. Easy to use on site
4. Low cost/high benefit ratio,
5. Fast response, high stability
6. Time saving features
7. Multiple sensor testing
8. Software
9. Modern design
10. Compliant with latest regulations.

One model is ideal for the Validation of Washer Disinfectors, Steam Sterilisers, Autoclaves. In place of a removable insert it has a fixed block with pockets for a reference probe and the type of test sensor commonly used in validation applications.

Simulators

These three models simulate a temperature sensor's output signal. Two for RTDs, one having laboratory performance, one provides a cost effective solution. The DP6 can both source and measure thermocouple signals with flexible reference junction operation. These models are made for Isotech by Cropico a UK company with a 50-year reputation for quality in electrical instrumentation

Small Hot Plate

The Isotech Model 983 is a simple, small hotplate for surface sensor calibration. It is ideal for use with the 944 True Surface Temperature Measurement System.

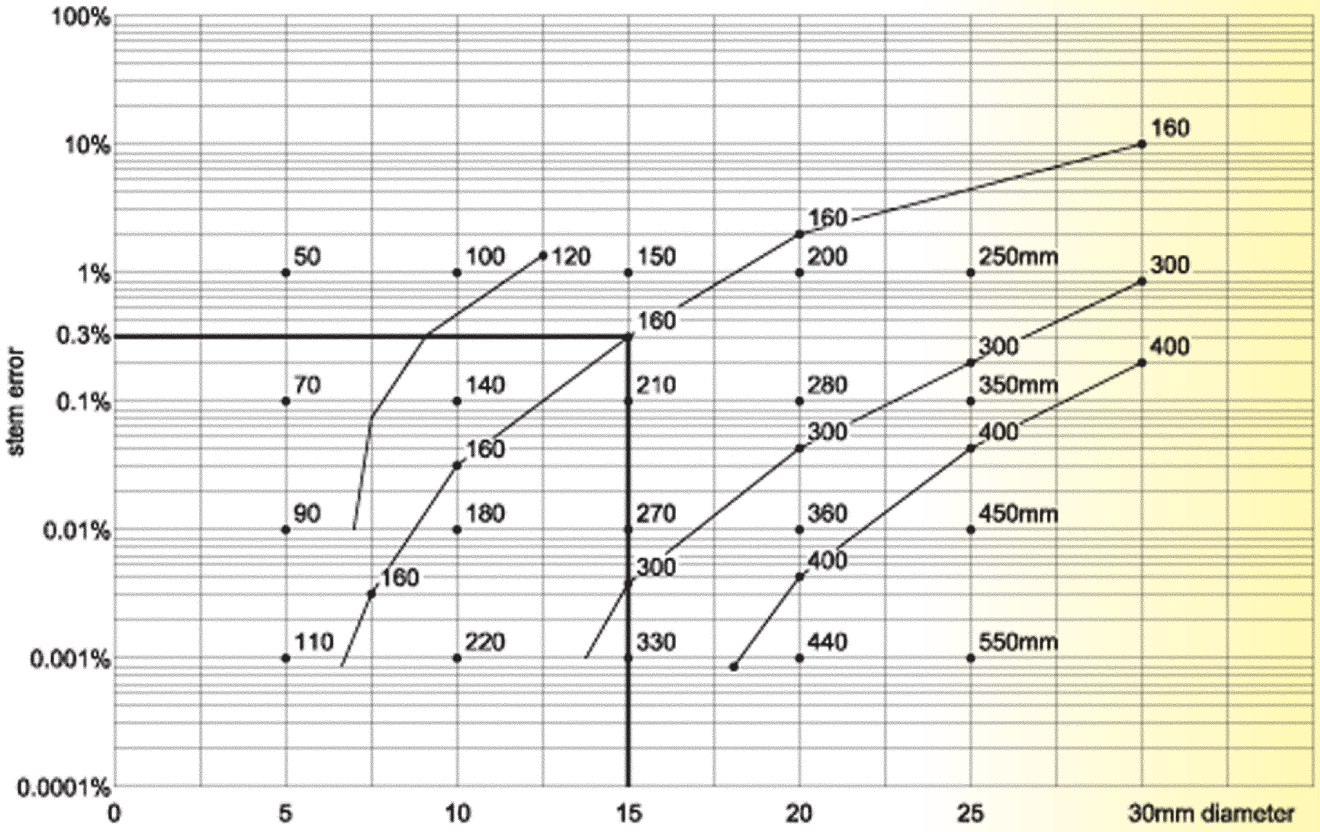
Fast Calibrators

Introduction to Fast Calibrators

Immersion depth is very important

When selecting a Dry Block Calibrator depth of immersion is very important. The chart below provides guidance in selecting a bath for immersion depth. Note that sensors with a long sensing length will require greater immersion. The chart is general and applies equally to all dry blocks - not to a particular model or manufacturer.

Immersion depths for various diameter thermocouples or thermistors in a dry block bath



Example shows 0.3% stem error for a 15mm diameter thermocouple immersed 160mm in a dry block.

Note 1. For sensors immersed in stirred liquids the diameter of sensor can be doubled, or the minimum depth halved.

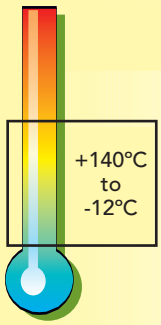
Note 2. The sensing length must be added to the above immersion depth calculation

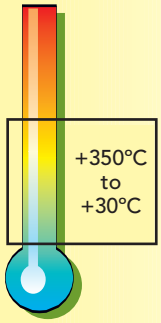
N.B. The above gives a good guide, however each sensor will be slightly different.

For full information on selecting the correct immersion depth for all types of sensors ask for our free 8 page immersion tutorial.

Quick-Cal Range

Temperature Test Unit





Isotech's Quick Cal range of testers are ideally suited to the less exacting applications where our larger, better specified baths are unnecessary.

The Low Temperature Quick Cal covers the temperature range of -12°C to +140°C, making it ideal for the medical, sterilisation and food industries.

The High Temperature Quick Cal covers the temperature range from 30°C to 350°C.

Both have interchangeable inserts, so you don't have to buy another calibrator each time you find a new diameter sensor to calibrate. The Low Temperature Quick Cal is particularly exciting since it can work from a small 12 volt battery, making it truly portable, alternatively a mains supply is available with 100V - 240V, 50/60Hz input.

The Low Temperature Quick Cal comes complete with two inserts, one blank and one drilled 6.8mm diameter 120mm deep. Alternatively we can provide pre-drilled inserts to suit your needs. Each calibration well is 13mm diameter and 120mm deep.

The High Temperature Quick Cal has a single larger well and interchangeable inserts, 25mm in diameter by 120mm deep. Blank and other special drillings are available to order. The High Temperature Quick Cal is supplied 100-130 or 200-250V AC, 50/60Hz.

The handbook which accompanies the Quick Cal contains helpful advice on how to get the best from your calibrator. Accessories for the above include a carry case, alternative inserts and a rechargeable battery for the Low Temperature Quick Cal.

Key Features

- **Interchangeable inserts -** to suit different diameter sensors.
- **Wide Temperature Range** -12°C to 350°C in two ranges.
- **Faster -** 9 minutes to temperature.
- **Compact -** 65mm x 142mm x 175mm not including power entry.
- **Lightweight -** weighs 1.5kg (3.3 pounds).
- **Two models -** Low Temperature Quick Cal and High Temperature Quick Cal.

Quick-Cal Range

Temperature Test Unit

Low Temperature Quick-Cal Options

A. Extra Sleeves	560-06-01A	Standard Sleeve
	560-06-01B	Blank Sleeve
	560-06-01C	Special Sleeve (maximum bore 10mm)
B. Carrying Case	931-22-66	
C. UKAS Certification		
D. Rechargeable Battery & Charger *Battery is 12V 12Ah.* *On full charge battery: 60 minutes when cooling* *90 minutes when heating* *Longer life available with larger batteries - consult Isotech* *Temperature Range is -10°C to 123°C with battery operation*		
E. Fahrenheit Operation *Unit can be supplied for °F Operation*		

High Temperature Quick-Cal Options

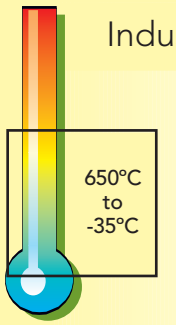
A. Extra Inserts	550-06-01A	Standard Insert
	550-06-01B	Blank Insert
	550-06-01C	Special Insert
B. Carrying Case	931-22-66	
C. UKAS Certification		
E. Fahrenheit Operation *Unit can be supplied for °F Operation*		
F. Semi Standard Platinum Thermometer, model 935-14-98		

Model No.	Low Temperature Quick-Cal
Temperature Range	-12°C to +140°C *In an ambient of 20°C* *The Quick-Cal will achieve lower temperature if used in a lower ambient temperature*
Set Point Resolution	0.1°C over range
Accuracy	±0.1 to ±0.4°C using Comparison Techniques ±0.4°C against display temperature with a single probe in the 6.8mm drilled sleeve
Stability	±0.05°C
Time to Set Point	9 minutes from 0°C to 100°C
Additional Time for best stability	Typically 5 minutes
Calibration volume	Two 13mm diameter pockets 120mm deep Supplied with two sleeves, one blank and one drilled 6.8mm diameter 120mm deep
Power	15V DC or 100-240V, Switch mode power supply (50 / 60 Hz)
Overall dimensions	Height 65mm Width 152mm Depth 175mm
Weight	1.5kg
How to Order	Low Temperature Quick-Cal Please specify Options required

Model No.	High Temperature Quick-Cal
Temperature Range	+30°C to +350°C *In an ambient of 20°C*
Set Point Resolution	0.1°C over range
Accuracy	±0.1 to ±0.4°C using Comparison Techniques <100°C ±0.4°C against display temperature with a single probe in the 4.5mm pocket >100°C ±1.5°C against display temperature with a single probe in the 4.5mm pocket
Stability	±0.05°C
Time to Set Point	9 minutes from Ambient to 350°C
Additional Time for best stability	Typically 5 minutes
Calibration volume	25mm diameter 120mm deep Supplied with insert, 5 pockets, 8mm, 6.5mm, 6.5mm, 4.5mm, 4.5mm, all 115mm deep
Power	100-130V or 200-240V, (50 / 60 Hz)
Overall dimensions	Height 65mm Width 152mm Depth 175mm
Weight	1.5kg
How to Order	High Temperature Quick-Cal Please specify Voltage required Please specify Options required

Fast-Cal Range

Industrial Temperature Calibrators



Fast-Cal - the product range you designed !

During early 2004 20 experienced engineers from many parts of the world were asked to produce their ideal specification for industrial calibration. Their top ten requirements, in order of priority, are listed below.

1. **Rugged**
2. **Lightweight**
3. **Easy to use on site**
4. **Low cost/high benefit ratio**
5. **Fast response, high stability**
6. **Time saving features**
7. **Multiple sensor testing**
8. **Software**
9. **Modern design**
10. **Compliant with the latest regulations**

They told us "Whatever you do don't use membrane keypads. They look great new, but after a year of being poked with ball point pens and screwdrivers the results have to be seen to be believed." We were going to include a picture but we might upset the competition.

The result is the range of Fast-Cal products.

Key Features

- Rugged, hard-wearing stainless steel case.
- Hygienic with no paint to chip or flake.
- No membrane keypads.
- Lightweight, between 6.35 and 6.60 kg depending upon the model.
- Easy to use on site. A soft, lightweight shoulder case makes transporting the Fast-Cal effortless.
- Fast response, high stability. Isotech has put 24 years of manufacturing and design experience into optimising the performance of the Fast-Cal. Compare the specifications overleaf. The block gradients are minimised by non-linear heating and cooling profiles to compensate for end losses to ambient temperature.
- The Fast-Cals are so easy to use you hardly need the manual.
- The Medium and High Fast-Cals incorporate a built-in Insert holder for ultra fast changes and restarts of calibration cycles.
- The Fast-Cals (excepting the 2010) all have the same sized removable inserts which can be drilled to your exact requirements. A standard insert is included, see the drawing on the following page.
- Benefit from the PC interface. Extra software is available for automatic calibration.
- The Fast-Cal design is modern and complies with all the relevant requirements and directives which are applicable.
- The Fast-Cals come with a certificate traceable to National Standards. Five point UKAS Certification is also available.
- Mains power variance immunity has been standard on all Isotech dry block calibrators since their conception. This feature resolves problems with fluctuating power supplies which if not acknowledged causes instability in the bath.

BASIC OR COMPLETE EXPLAINED

FAST-CALS ARE AVAILABLE IN BASIC OR COMPLETE MODELS

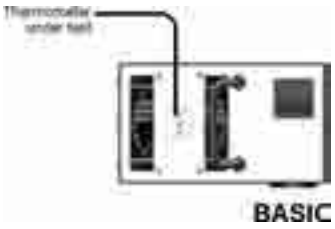
A BASIC DRY BLOCK CALIBRATOR

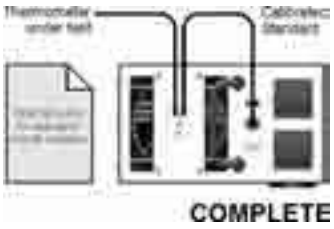
The thermometer under test is compared to the dry block controller value. useful for moderate temperature ranges and quick testing.

AN ISO 9000 CALIBRATION SYSTEM

A thermometer under test is compared to a calibrated standard, for true traceability and clearly meets the requirements of ISO9000.

Complete models include a semi-standard probe. See order form for details.





Fast-Cal Range

Industrial Temperature Calibrators

FAST-CAL OPTIONS

Metal Block Insert	907-02-03	Standard Insert Included (Low and Medium)
	907-02-03b	Blank Insert (Low and Medium)
	907-02-03c	Special Insert (Low and Medium)
	907-02-03d	Standard Insert Included (High only)
	907-02-03f	Blank Insert (High only)
	907-02-03g	Special Insert (High only)

UKAS Calibration	UKAS Calibration available to Order

FAST-CAL INSERTS

Fixed Block 2010

Model HTM2010 has a fixed block optimised for Hospital Validation Systems.

Ø8.0mm x 145mm deep
Ø6.5mm x 145mm deep
Ø4.5mm x 145mm deep
Ø4.5mm x 145mm deep
Ø4.5mm x 145mm deep

Standard Insert **Low, Medium, High**

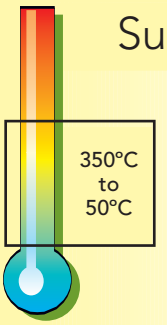
Ø8.0mm x 140mm deep
Ø6.5mm x 140mm deep
Ø4.5mm x 140mm deep
Ø4.5mm x 140mm deep
M4 Extraction Hole

Model No.	**FAST-CAL HTM 2010**	**FAST-CAL LOW**	**FAST-CAL MEDIUM**	**FAST-CAL HIGH**
Range at 20°C	-35 to +140°C	-35 to +140°C	30 to 350°C	35 to 650°C
Stability	0.02°C	0.02°C	0.03°C	0.03 to 0.05°C
Accuracy - Basic	±0.2°C	±0.2°C	±0.3°C	±1°C (500°C) ±2°C (650°C)
Accuracy - Complete*	±0.15°C	±0.15°C	±0.2°C	±0.5°C
Heating Time	-30 to +140°C In 15 minutes	-30 to +140°C In 15 minutes	50 to 350°C In 15 minutes	50 to 650°C In 20 minutes
Cooling Time	+140 to 0°C In 15 minutes	+140 to 0°C In 15 minutes	350 to 100°C In 40 minutes	650 to 300°C In 20 minutes
Calibration Capacity	145mm depth 8Ø, 6.5Ø, 3 x 4.5Ø	148mm depth 25mm Ø	148mm depth 25mm Ø	148mm depth 25mm Ø
Power	150W	150W	750W	750W
Traceable Certificate	Included	Included	Included	Included
UKAS Certificate	Extra	Extra	Extra	Extra
PC Communications	Included	Included	Included	Included
Software	Included	Included	Included	Included
4-20mA Input	Complete Models	Complete Models	Complete Models	Complete Models
Thermal Switch Test	Complete Model with Software	Complete Model with Software	Complete Model with Software	Complete Model with Software
Ramps and Dwells	Yes with Software	Yes with Software	Yes with Software	Yes with Software
Dimensions	228 x 248 x 143mm	228 x 248 x 143mm	228 x 248 x 143mm	228 x 248 x 143mm
Weight	6.60kg	6.60kg	6.35kg	6.35kg
How to Order	**FAST-CAL HTM2010** Basic or Complete Please specify Voltage Please specify Options	**FAST-CAL LOW** Basic or Complete Please specify Voltage Please specify Options	**FAST-CAL MEDIUM** Basic or Complete Please specify Voltage Please specify Options	**FAST-CAL HIGH** Basic or Complete Please specify Voltage Please specify Options

*When used with a suitable Isotech Semi Standard PRT.

983 Small Hot Plate

Surface Sensor Calibrator



The Isotech Small Hotplate is a lightweight portable calibration system purpose designed for surface mounted sensors. The flat surface plate is made from precision-machined aluminum. The sensor to be tested is simply placed on the surface, for higher accuracy a calibrated surface sensor can be placed alongside and the two compared, see page 68 for details.

Good thermal contact is ensured by the flat disk that is recessed to allow the optional use of a heat transfer paste or fluid. Uniform heat distribution is achieved with a flat spiral heater clamped to an integrating block below the surface of the plate. The typical accuracy that can be achieved 1°C but this will be influenced by the type of sensor to be calibrated.

The internal control sensor is located immediately below the plate's surface.

A protective cover that can fit over the block is included along with a comprehensive handbook. The Hot Plate can be supplied configured for Fahrenheit operation, please specify on order.

The temperature range is from 35 to 350°C, which is set by an advanced, but easy to use temperature controller. The controller has been upgraded to have 0.01 resolution below 100°C (0.1° above 100°). A PC interface is included as standard along with an RS232 converter lead and Windows software.

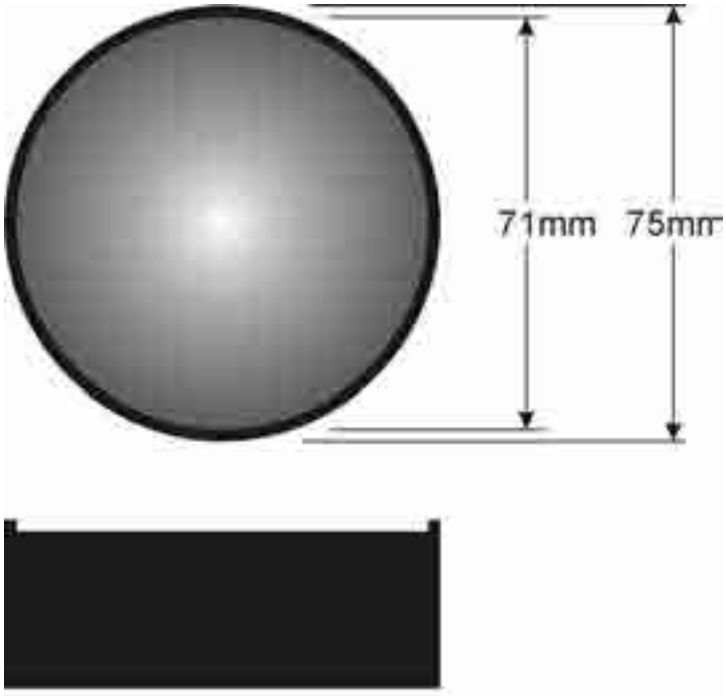
Isotech has a True Surface Temperature Measurement System (see page 72) which is ideal for use with this surface sensor calibrator.

Key Features

- **Low Cost Portable Hot Plate.**
- **PC Interface and Software.**
- **Stable to +/- 0.1C.**

983 Small Hot Plate

Surface Sensor Calibrator



Dimensions of hotplate

Model No.	983 Small Hot Plate
Temperature Range	50°C to 350°C
Stabilisation Time	10 minutes
Cools from	350°C to 100°C in 125 minutes
Heats from	50°C to 350°C in 20 minutes
Uncertainties	Dependant on sensors and method of use 1°C typical
Calibration volume	Flat Plate 71mm diameter
Display Resolution	0.01 to 99.99 0.1 100 to 350.0 PC can display 0.01 across whole range with the software included
Indicator units	°C, °F, K
Power	100 to 115V (50 / 60 Hz) or 200 to 230V (50 / 60 Hz) 200 Watts
Overall dimensions	Height 115mm Width 230mm Depth 225mm
Weight	3.9kg
How to Order	983 Small Hot Plate Please specify voltage required

Notes:

A similar model but with a black high emissivity surface is available, please refer to databook 4 for details.

Many of the dry block calibrators featured earlier within this databook have accessories available for surface sensor calibration.

Pt100 S2

Resistance Thermometer Simulator

Model Pt100 S2 is a simple to use simulator for platinum resistance thermometers (Pt100). Simply connect the Pt100 S2 to the instruments RTD input and simulate the resistance thermometer by selecting one of the 24 preset calibration points between -100C and 500C.

Model Pt100 S2 gives the benefit of high accuracy and low drift in a solid metal case. Wire wound resistance elements give good stability with low temperature coefficients. The high quality switch has low contact resistance and the overall accuracy is better than 0.15C with a temperature coefficient less than <10ppm. The unit features high long term stability of 0.01% per year.

To simplify connection to the temperature indicator the Pt100 S2 has 4mm binding posts which accept bare wires, spade terminals and 4mm plugs. It is suitable for two, three and four wire connections, accuracy quoted is for four wire connection. The temperature resistance relationship is as defined in IEC 751.

The unit ships with a certificate traceable to National Standards or optionally UKAS Calibration from Isotech's leading temperature laboratory.

This product is made for Isotech by Cropico who over a 52-year period have gained a reputation of being one of the world's leading manufacturers of electrical instruments and resistance sources.

Pt100S/2 - Temperature Values

Temperature °C	-100	-80	-60	-40	-20	-10	0	10	20	30	40	50
	60	70	80	90	100	150	200	250	300	350	400	500

Accuracy	±0.15°C
Temperature Coefficient	≤10ppm/°C

Terminals: Four 4mm binding posts accept spade and 4mm banana plugs.
Working Temperature: +5 to 40°C
Storage Temperature: -5 to +50°C
Switch: CROPICO type SP1 switch with low and constant contact resistance.
Resistance Elements: Wire wound resistors with low temperature coefficient and long term stability †0.01%/year.
Case: Painted Aluminium.
Dimensions: 190 wide, 110mm deep, 95mm high.
Weight: 0.75kg approx.

Key Features

- **High Calibration Accuracy**
- **Rugged Construction**
- **High Quality Switching**
- **High Accuracy Wire Wound Resistance Elements**
- **Low Drift**

How to Order Pt100 S2
Please specify if UKAS calibration is required.

Model 006-B

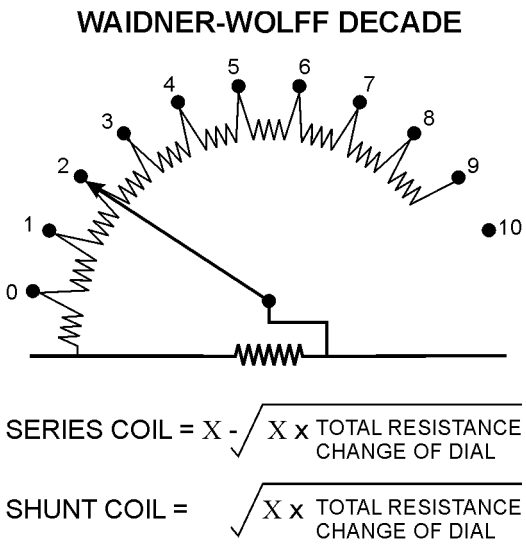
Laboratory Accuracy Resistance Box for RTD Simulation

As industry increasingly moves to high precision instrumentation there is an increasing need to utilise very high performance test and service equipment. Model 006-B is a laboratory accuracy six decade resistance box with a total resistance of 1,112.11Ω.

The performance is made possible using the Waidner-Wollf decade which avoids problems when switching low values by employing series and shunt coils. Simple to operate with a resolution of just 0.001Ω (a nominal 0.0025°C). To use just dial in the required resistance value.

The resistor windings use an exclusive 'air cushion' technique providing virtually stress-free elements. For improved performance the elements are non-inductively wound and the direction of each winding is reversed at the half turn points. Accuracy is +/-0.01% with exceptional stability and temperature coefficients of just ±35 ppm/ 10,000 hours. Noise is essentially non-measurable. The unit ships with a certificate of conformity or optionally UKAS Calibration from Isotech's leading temperature laboratory.

This product is made for Isotech by Cropico who over a 52-year period have gained a reputation of being one of the world's leading manufacturers of electrical instruments and resistance sources.



Decade	Accuracy	I max
10 x 0.001Ω	±2%	1.4A
10 x 0.01Ω	±1%	1.4A
10 x 0.1Ω	±0.5%	1.4A
10 x 1Ω	±0.2%	300mA
10 x 10Ω	±0.01%	100mA
10 x 100Ω	±0.01%	30mA

Residual Resistance 1Ω
(1 ohm dial starts at 1 not 0)

Key Features

- **Accuracy 0.01%**
- **6 decades, 0.001Ω Resolution**
- **High quality switches ensure trouble free operation**
- **Low temperature coefficient**
- **Wire wound Resistors ensure high accuracy and permanence of calibration**
- **Suitable for both Laboratory and on-site calibration**
- **Special Waidner-Wolff Decade construction eliminates errors due to residual resistance**

How to Order	006-B Please specify if UKAS calibration is required.

Model DP6

Thermocouple Calibrator/Simulator

Use the portable DP6 to electrically simulate thermocouples and to measure thermocouple outputs. Simply program the desired thermocouple type and desired temperature and the DP6 will provide the equivalent voltage signal for a thermocouple at that temperature.

Flexible reference junction operation allows for automatic cold junction compensation, manual value entry or it may be switched off when an ice point reference is used. DP6 supports ten major thermocouple types and can be switched for operation in °C, °F, K or mV. For convenient portable operation the DP6 has an internal rechargeable battery giving a typical continual use of 15 hours.

A transport case is included and has room for the charger and a copper transition adapter that allows easy connection to miniature thermocouple connectors.

The instrument has a high contrast LCD display and a second two line alphanumeric LCD display for programming and display of configuration data independent of the main measurement display. In addition to English the language for the set up can be set to Spanish, French, Italian or German. Choose the calibration between IPTS68 and ITS-90.

Save time by storing commonly used values in the 130 store memory.

The DP6 brings precision, high integrity performance for the industrial user, see the tables for the one year accuracy figures.

This product is made for Isotech by Cropico who over a 52-year period have gained a reputation of being one of the world's leading manufacturers of electrical instruments and resistance sources.

Working Temperature
0 to 40°C

Storage Temperature
-20 to +50°C

Battery
6 Volt 1.2 Ah sealed lead acid, replaceable

Operating Time
15 Hours typical continual use

Charger Type
External charger operating from main supply

Case
Shockproof thermoplastic with polycarbonate sealed membrane keyboard
Soft carrying case available as an accessory

Size
150mm Wide, 130mm Deep, 60mm High
350 x 260 x 65mm in transport case

Weight
1.4kg

Key Features

- **Linearised for 10 Thermocouple Types**
- **Measures and Sources**
- **Calibrated in °C, °F, K and mV.**
- **1µV Resolution**
- **Reference Junction Compensation**
- **Rechargeable Battery**
- **Memory with 130 stores**
- **Digital Calibration**

How to Order DP6
Please specify if UKAS calibration is required.

Model DP6

Thermocouple Calibrator / Simulator

Model DP6			
Thermocouple Type		Range	Accuracy
Code	Material	Degrees C	Measure & Source
B	PtRh30-PtRh6	+500 to +1820 +200 to +500 +60 to +200	±0.5°C ±1.5°C ±6.0°C
E	NiCr-CuNi	-200 to +1000 -250 to -200 -270 to -250	±0.2°C ±0.6°C ±6.0°C
J	Fe-CuNi	+800 to +1200 +200 to +800 0 to +200 -210 to 0	±0.3°C ±0.2°C ±0.1°C ±0.3°C
K	NiCr-NiAl	+1000 to +1370 +100 to +1000 -50 to +100 -150 to -50 -225 to -150 -270 to -225	±0.4°C ±0.3°C ±0.1°C ±0.2°C ±0.5°C ±3.0°C
L	Fe-CuNi	+300 to +900 -100 to +300 -200 to -100	±0.2°C ±0.1°C ±0.15°C

Thermocouple Type		Range	Accuracy
Code	Material	Degrees C	Measure & Source
N	NiCrSi-NiSi	+1100 to +1300 +400 to +1100 +150 to +400 0 to +150	±0.4°C ±0.3°C ±0.15°C ±0.1°C
R	PtRh13-Pt	+1200 to +1760 +100 to +1200 0 to +100 -50 to 0	±0.8°C ±0.4°C ±0.5°C ±0.8°C
S	PtRh10-Pt	+1400 to +1760 +1200 to +1400 +50 to +1200 -50 to +50	±0.95°C ±0.5°C ±0.4°C ±0.6°C
T	Cu-CuNi	-100 to +400 -230 to -100 -250 to -230 -270 to -250	±0.2°C ±0.5°C ±1.0°C ±2.5°C
U	Cu-CuNi	+300 to +400 0 to +300 -150 to 0 -200 to -150	±0.2°C ±0.1°C ±0.15°C ±0.2°C

Resolution on all types of thermocouple 0.1°C, 0.1°F, 0.1K. Limits of error apply for 1 year at 20°C ±1°C.

Range	Maximum Display	Uncertainty	Resolution
10mV	±15.000mV	±0.02% or reading ±0.015% FS	1µV
100mV	±150.000mV	±0.01% of reading ±0.015% FS	10µV
1V	±1.5V	±0.01% of reading ±0.015% FS	100µV

Temperature coefficient: typically 17 ppm / °C +0.2µV / °C

Reference Junction Specification

Reference Junction
Referenced to 0°C and with three operating modes. Automatic with internal sensor, Off (=to 0°C) and Manual entry via keyboard.

Accuracy
Better than ±0.1°C at +20°C

Deviation
0.01°C / °C over the range 0 to +50°C

Manual Input Range
The reference junction reference value may also be set via the keyboard over the range 0 to +100°C.

Indicators, Probes

& Accessories - Introduction

PRT and PRT / Thermocouple Indicators

Our TTI range are *True Temperature Indicators,* this means individual calibrated sensors can have their calibration values programmed into the TTI. The instrument then digitally 'calibrates' to suit the probe and the TTI shows the corrected value accordingly. Additional manual measurements are not required to compute the precise temperature readings since these are displayed correctly, miscalculation errors are avoided.

These instruments both have two channel operation, which allows for a calibrated reference probe to be used on one channel, with the unit under test on the second, permitting simultaneous comparison calibration which eliminates many errors compared to a single channel system that calibrates sequentially.

When several sensors need to be switched Isotech has a range of Selector Switches to accompany the indicators, along with software to ease and automate the instruments use.

True Surface Temperature Measuring System

This is a true temperature indicator for use with surface temperature measurement, ideal for use with the small hot-plate model 983, see page 44.

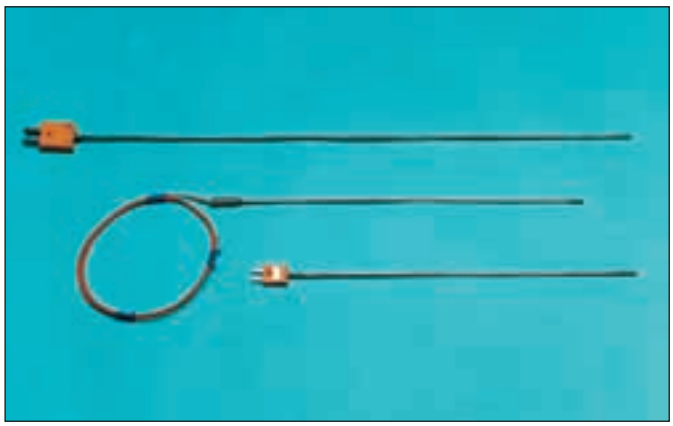
Indicators, Probes
& Accessories - Introduction

Semi Standard Resistance Thermometers and Thermocouples

This section includes a range of "Semi Standard" thermometers that can be used with the TTI's. These precision semi standards are more rugged and affordable than the standard thermometers featured in Databooks 1 and 2 – and ideal for most industrial applications.

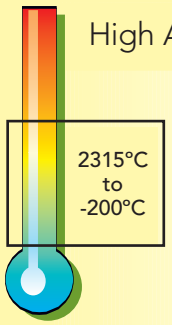
Fixed Resistors

Isotech have a miniature resistor with an ultra low temperature coefficient, model 836, with accuracies of ±0.005% and temperature coefficients of less than 1ppm. These resistors offer an outstanding cost to performance ratio and will find use alongside a model from our TTI range and in other areas of industrial calibration. For more information see page 70.



TTI-7 PLUS

High Accuracy PRT and Thermocouple Thermometer



The TTI-7 PLUS is a very high accuracy multi purpose digital thermometer for both platinum resistance thermometers and thermocouples. Laboratory users will welcome the features to eliminate Thermal EMF Errors and Self Heating Errors along with provision to store the calibration data of up to 20 PRT probes. The rugged aluminum case, internal battery pack and integrated power supply ensure reliable portable field use for demanding measurement applications all at great value for money.

Dual Channel input allows a probe on Channel B to calibrated against a standard on Channel A - directly compare any combination of PRT and Thermocouple. The TTI-7 PLUS now supports thirteen thermocouple types, B, C, D, E, J, K, L, N, R, S, T, U, Au/Pt along with 25 and 100 ohm platinum resistance thermometers.

Data Logging and Statistical Analysis
The TTI-7 PLUS includes an inbuilt data logger internally storing up to 4,000 date and time stamped readings. Recall the data from the front panel or send to a PC or Printer via the PC interface which is included as standard. The powerful math function enables statistical analysis of the captured data, mean, max, min, peak and standard deviation. The TTI-7 plus now also includes a real time rolling display.

Usability
Ease of use, password protected digital calibration and a large clear backlit LCD graphics panel ensure the TTI-7 PLUS is a delight to use. Resistance thermometer connections are via LEMO connectors. Both sub miniature thermocouple and standard thermocouple plugs are accepted directly into the thermocouple inputs with no need for further adapters.

Why the TTI-7 PLUS ?
The TTI-7 PLUS has the features you need for high accuracy temperature measurement. With resistance thermometers used at high temperatures unwanted thermal EMFs are generated, the TTI-7 PLUS can take two measurements switching the polarity then computing the average to eliminate this error source. Many other instruments lack the ability to eliminate thermal EMFs. The thermal EMF error can be greater than the quoted accuracy of an instrument, if you need small measurement uncertainty for high temperature PRT work you need this feature. Add the internal scanner to expand the instrument to have up to 10 channels - any or all can be scanned and lodged with the internal data logger.

High accuracy, highest accuracy is for Pt100 inputs, the TTI-7 PLUS Uncertainty of Measurement (1 Year) in the range -100°C to 500°C is 0.01°C. Watch for specifications that quote the value at -100°C and then get larger as the temperature rises. The TTI-7 PLUS is optimized over the most frequently used and useful temperature range. For thermocouple measurements the automatic CJC is far better than 0.1°C at 20°C. Great design care was taken, both thermocouple inputs are measured with separate Pt100 sensors. This approach gives outstanding CJC performance, again a point to check against other instruments which can have significantly less performance.

Read the TTI-7 PLUS Buyers Guide
http://www.isotech.co.uk/tti7

Key Features

- **Now accepts 25 and 100 ohm Resistance Thermometers - Conversion to ITS-90 and IEC 751**
- **Eliminate unwanted thermal EMFs with current reversal**
- **Expandable to have 10 input channels**
- **Inbuilt data logger stores up to 4000 measurements**
- **Portable - 10 hours use from internal battery**

TTI-7 PLUS

High Accuracy PRT and Thermocouple Thermometer

TECHNICAL SPECIFICATION

Sensor	Range (°C)	Resistance (Ohm)	Current	Resolution °C °F K	Uncertainty 1 year @ 20 ±5°C
Pt25	-200 to -100	2.5 to 15	1mA	0.001	0.02°C
Pt25	-100 to +500	15 to 75	1mA	0.001	0.01°C
Pt25	+500 to +670	75 to 115	1mA	0.001	0.02°C
Pt100	-200 to -100	10 to 60	0.5mA	0.001	0.02°C
Pt100	-100 to +500	60 to 280	0.5mA	0.001	0.01°C
Pt100	+500 to +670	280 to 460	0.5mA	0.001	0.02°C

Type	Range °C	Common Name	Resolution °C °F K	Standard	Uncertainty @20°C ±5°C 1 Year	Uncertainty @20°C ±5°C 60 Days
B	+250°C to +1820	Platinum / Rhodium	0.01	NIST 175	±(0.025% Rdg + 0.006%FS)*	±(0.02% Rdg + 0.006%FS)*
C	0 to +2315	Tungsten / Rhenium	0.01	ASTM E988	±(0.075% Rdg + 0.005%FS)	±(0.05% Rdg + 0.005%FS)
D	0 to +2315	Tungsten / Rhenium	0.01	ASTM E988	±(0.075% Rdg + 0.005%FS)	±(0.05% Rdg + 0.005%FS)
E	-200 to +1000	Chromel / Constantan	0.01	NIST 175	±(0.026% Rdg + 0.004%FS)	±(0.01% Rdg + 0.004%FS)
J	-210 to +1200	Iron / Constantan (SAMA)	0.01	NIST 175	±(0.03% Rdg + 0.005%FS)	±(0.008% Rdg + 0.005%FS)
K	-200 to +1372	Chromel / Alumel	0.01	NIST 175	±(0.035% Rdg + 0.006%FS)	±(0.01% Rdg + 0.006%FS)
N	-200 to +1300	Nicrosil / Nisil	0.01	NIST 175	±(0.035% Rdg + 0.005%FS)	±(0.01% Rdg + 0.005%FS)
R	-50 to +1768	Platinum / Rhodium	0.01	NIST 175	±(0.02% Rdg + 0.015%FS)	±(0.005% Rdg + 0.015%FS)
S	-50 to +1768	Platinum / Rhodium	0.01	NIST 175	±(0.02% Rdg + 0.015%FS)	±(0.005% Rdg + 0.015%FS)
T	-200 to +400	Copper / Constantan	0.01	NIST 175	±(0.025% Rdg + 0.015%FS)	±(0.005% Rdg + 0.015%FS)
U	-200 to +600	Copper / Constantan	0.01	DIN 43710	±(0.025% Rdg + 0.015%FS)	±(0.005% Rdg + 0.015%FS)
L	-200 to +500	Iron / Constantan	0.01	DIN 43710	±(0.03% Rdg + 0.005%FS)	±(0.008% Rdg + 0.005%FS)
Au/Pt	0 to +1000	Gold / Platinum	0.01	NIST - Burns	±(0.02% Rdg + 0.015%FS)	±(0.005% Rdg + 0.015%FS)

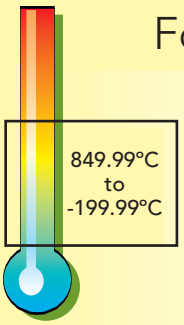
TC input for external CJC, automatic CJC is better than 0.1°C at 20°C, typically 0.01°C / °C over the range 0°C to 100°C *Apply to readings above 600°C

Model No.	TTI-7 PLUS
Temperature Range	Depending on Sensor -200 to 2315°C
Indicator units	°C, °F, K
Display	LCD Graphics Panel, 240 x 64 Dot with LED backlight contrast control via keyboard
Maths	Display Min / Max, Peak to Peak and Standard Deviation
PC Interface	RS232 and Software Included
Data Logging	Includes a data logging function, enabling up to 4000 single channel (2000 dual channel) readings to be stored together with a date and time stamp. The stored values can be recalled to the instrument display, downloaded to a PC file or printer.
Inputs	Thermocouples via sub miniature and standard connectors. Reference Junction Compensation - Automatic with internal sensor, or with external Pt100 probe. PRTs Lemo Socket.

Working Temperature	0°C to 40°C rel. humidity 80% max non condensing
Storage Temperature	-20°C to +50°C.
Main Supply	100/120/220/240 Volts +10% -13% 47 to 63Hz max. 40VA
Dimensions	Height 110mm Width 219mm Depth 315mm
Weight	8kg
Battery	Sealed lead acid, rechargeable cell giving approximately 10 hours continuous operation. Internal battery charger.
Scanner Option	With the scanner option fitted, scanner cards may be inserted into slots on the rear panel, cards for thermocouples and Platinum resistance thermometers are available, giving a maximum of 10 measuring channels. Each scanner card has 4 channels and up to 2 cards may be fitted, either thermocouple or PRT in any combination.

TTI-6

For 3 & 4 Wire PT100's



The TTI-6 is a high precision portable thermometer for metrology and other exacting laboratory applications, the TTI-6 is a proven instrument used World-wide as a laboratory and site standard. It is particularly suitable as the reference standard for temperature calibration baths.

The TTI-6 Digital Thermometer utilises highly advanced microprocessor circuit design to achieve exceptional measuring accuracy, linearisation conformity and stability in a versatile but easy to use configuration.

Based on a high resolution 20 Bit Analogue to Digital convertor, all measurement computations are performed digitally without drift. The 5 LED display provides a readout to 0.01°C over the entire -199.99°C to +849.99°C range; alternatively °F, Kelvin or Ohms values can be displayed up to 999.99 units.

Single or dual Pt100 3 or 4 wire sensors are accepted, the TTI-6 will automatically recognise and select 3 or 4 wire mode. Display of input A, B or A - B (differential) can be selected; a differential "zero function" allows sensor accuracy differences to be eliminated for accurate differential readings.

Calibrated sensors can have their calibration points programmed into the TTI-6 via a personal computer using Isotech Software. The instrument then digitally self calibrates to the probe(s) providing corrected temperature readout to give optimum system accuracy.

A common application is for the comparison calibration of a sensor on channel B against a reference standard on channel A. With one of the Selector Switches several sensors can easily be compared to a standard probe on A.

The instrument includes a UKAS certificate as standard (simulation calibrated). Isotech also offers a complete system calibration (probe and instrument combined). Refer to Databook 5 for details.

Key Features

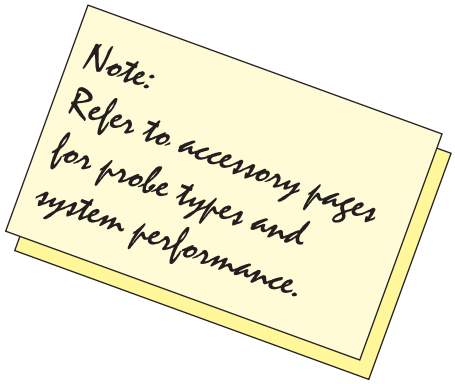
- **Two channel RTD indicator.**
- **RS232 and analogue output as standard.**
- **Correction facility for optimum system accuracy.**
- **Includes UKAS certificate and Cal NotePad Software.**

TTI-6 shown with optional Terminal Adaptor and Probe

TTI-6

For 3 & 4 Wire PT100's

Input Type	*Temperature Range*	*Overall accuracy*
Pt100 *To IEC 751, Amendment 2, (1995. -199.99 to 849.99°C. Ro=100Ω. Two input channels, each 3 or 4 wire connection with automatic recognition (with manual override)*	-199.99°C to 849.99°C	±0.02°C ±1 digit for range -200°C to +500°C ±0.005% reading ±1 digit for range 500°C to 850°C



Options

Carrying Case	931-22-71	Soft vinyl carrying case

Model No.	TTI-6
Linearisation Conformity	±0.01°C
Stability (vs ambient temperature)	0.0025°C / °C ambient change
Pt100 Sensor Current	0.5mA nominal
Resolution of data display	0.01°C, K, °F, Ω

Note: All values are valid for a nominal 240V 50Hz supply and 20°C ambient temperature (±2°C)

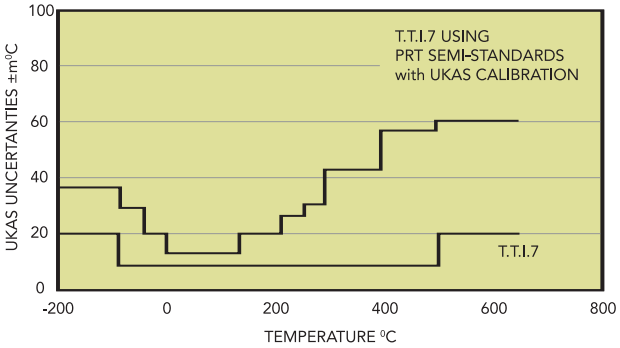
Measurement units	°C, °F, K, Ω,
Measurement modes	Input A or B or A-B (differential) Null facility in A-B mode
Custom calibration	Up to 10 calibration values can be allocated to (via PC DOS software) channels A and B. Values are retained in non-volatile memory until replaced by user
Null Function	Corrects differential temperature readout between two sensors to zero
Display	14mm LED, 5 digit, 999.99 range
Front panel controls	5 x membrane keys for user functions
Input Connections	2 x Pt100 via 'Lemo' connectors
Analogue output (standard)	Analogue 0 to 1 Volt d.c. Between programmable (standard) lower and upper set limits representing channel A, B or A-B. Accuracy 0.5% of reading. Non-isolated
Power Supply	Internal chargeable batteries. Mains 220/240V 50/60Hz, adaptor included. Battery life up to 12 hours with full charge dependent on pattern of usage. Charger requirement 10-11.5V d.c. 1A.10W nominal, max 20W
Overall dimensions	Height 145mm Width 66mm Depth 240mm
Weight	1.5kg
How to Order	TTI-6

TTI Accessories

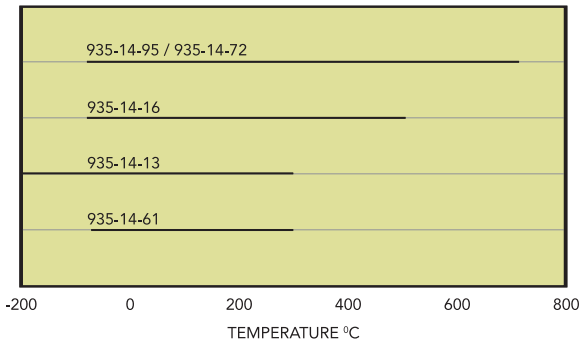
True Temperature Indicator Accessories

TTI-7

SYSTEM UNCERTAINTY
T.T.I.7 ISOTECHS UKAS UNCERTAINTIES (2 sigma)
Using semi-standards

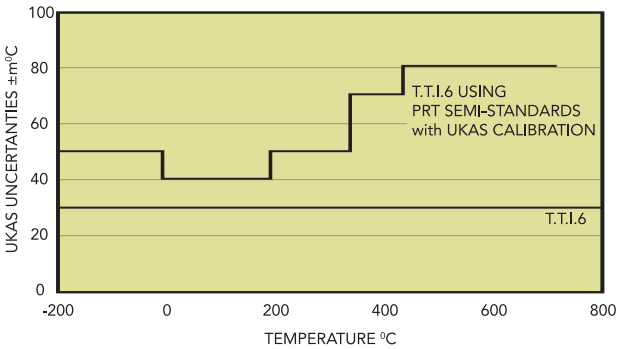


TEMPERATURE RANGE OF VARIOUS
SEMI-STANDARDS THAT CAN BE USED WITH T.T.I.7

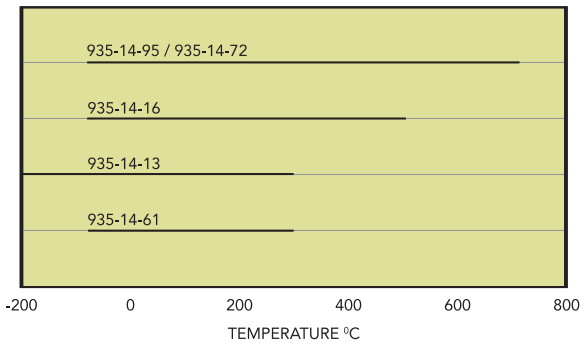


TTI-6

SYSTEM UNCERTAINTY
T.T.I.6 ISOTECHS UKAS UNCERTAINTIES (2 sigma)
Using semi-standards



TEMPERATURE RANGE OF VARIOUS
SEMI-STANDARDS THAT CAN BE USED WITH T.T.I.6

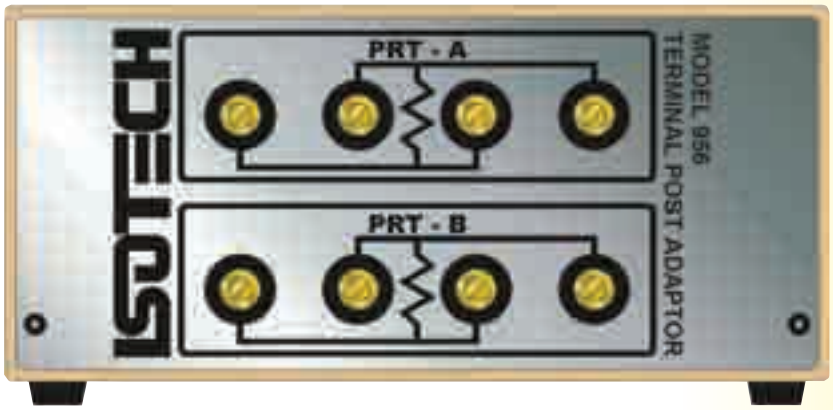


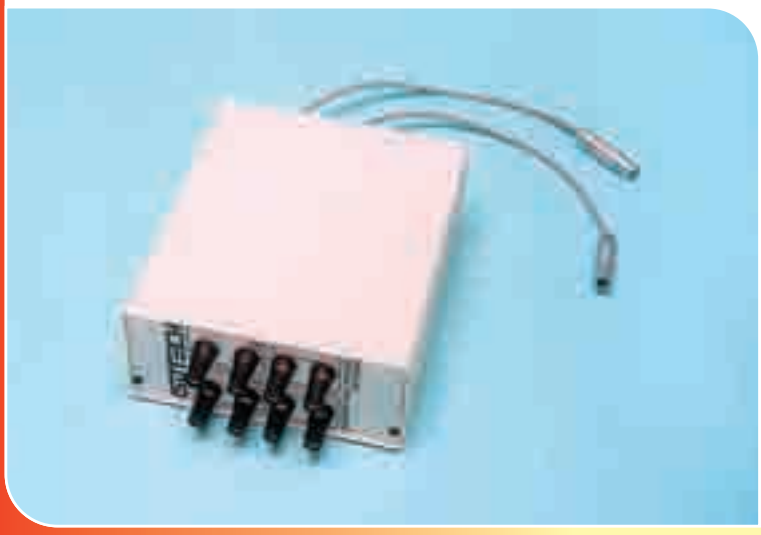
TTI Accessories

True Temperature Indicator Accessories

Terminal Adaptor

Our TTI range use high quality 'Lemo' connectors for the Pt100 inputs. This simple accessory provides 4mm Terminal Posts for the connection of bare wires, spade terminals or 4mm plugs - useful if a lot of probes are going to be used with the instrument.

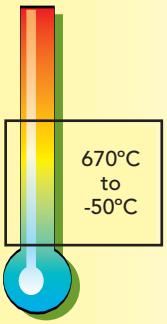




Overall dimensions	Height	68mm (including feet)
	Width	140mm
	Depth	185mm (including connectors)
Weight	0.660kg	
How to Order	956 Terminal Adaptor	

Semi-Standards

Platinum Resistance Thermometers



In most industrial laboratories the costly and mechanically fragile SPRT is unnecessary. For these applications the uncertainties may be larger, and hence the Isotech range of semi-standards may be a more practical choice. Usually made in stainless steel sheaths 6mm in diameter, with an Ro value of 100Ω and an $(R_{100}-R_0)/R_0$ of 0.385. A number of configurations are available since particular characteristics might be required such as short sensing length, fast response, or applicability to a particular temperature range.

In this collection of semi-standards Isotech has examined not only the uses that customers put them to but also the equipment that is used to calibrate them. Most units are now a little longer and have a slightly wider temperature range than our previous products.

The length of a thermometer is important, during calibration it needs to have sufficient length to allow adequate immersion in the calibration bath. In use it needs to be long enough to allow the handle to remain below 80°C whilst the measuring end is at high temperatures. To avoid damage to the thermometer assembly ensure in use that the handle or head of the thermometer remains below 80°C.

The stability of the semi-standard will depend upon its range of usage; your semi-standard should remain with those uncertainties between successive annual calibrations, unless you drop it or otherwise mechanically shock it. Our semi-standards are now fitted with a handle and strain relief bush for the cable, except where otherwise stated. All are made with our own high quality 100 ohm detectors and completely assembled and calibrated in-house in our UKAS accredited and supervised Laboratory. Calibration is available with fixed points for the best uncertainties and to give the highest confidence possible.

Please note that stem conduction accounts for the biggest sources of errors during calibration. Remember that for a given immersion depth stem conduction is dependent on the temperature difference between the sensing element and ambient temperature, and on the total conductance of the thermometer assembly. It is sometimes thought (mistakenly) that a shorter thermometer will be subject to less stem conduction.

Advantages

- **Ideal for all Industrial applications.**
- **High Stability.**
- **Low Drift.**
- **Can be supplied with UKAS Calibration.**
- **Selection of Temperature Ranges.**
- **Choice of lengths and diameters.**
- **Specials available to special order.**
- **Long life.**
- **Maximum accuracy for many of our Industrial products.**

Semi-Standards

Platinum Resistance Thermometers

Model Number	935-14-61	935-14-13	935-14-16	935-14-72	935-14-95
Diameter (A)	4mm	6mm	6mm	6.35mm	6.35mm
Length (B)	300mm	350mm	450mm	375mm	450mm
Sensing Length	6mm	25mm	25mm	25mm	25mm
Handle (C)	Yes	Yes	Yes	No	Yes
Cable (D)	2m PTFE 4 wire	2m PTFE 4 wire	2m PTFE 4 wire	2m PTFE 4 wire	2m PTFE 4 wire
Temperature Range (°C)	-50°C to +250°C	-196°C to +250°C	-100°C to +450°C	-50°C to +670°C	-100°C to +670°C
Application	Fast Response	Low Temperature Use	General Use	General Use Gemini Jupiter	General Use Medusa
Features	Small Stem Conduction		316 stainless steel sheath	Fits lid of Carry-case	Metal alloy sheath

Model Number	935-14-82	935-14-85	935-14-98
Diameter (A)	4mm	6mm	4mm
Length (B)	210mm	420mm	300mm
Sensing Length	6mm	25mm	8mm
Handle (C)	No (Angled Pot)	No (Angled Pot)	No
Cable (D)	1.5m PTFE 4 wire	540mm PTFE 4 wire	2m PTFE 4 wire
Temperature Range (°C)	-50°C to +250°C	-50°C to +250°C	-50°C to +350°C
Application	Europa Venus Calisto	Oceanus-6	Fast Response
Features	General Purpose	General Purpose	Small Stem Conduction

Model No.	Refer to Chart
Temperature Range	Refer to Chart
Ro	100 ohms ±0.05 ohms
Alpha	0.003850 ±0.000005
Stability	0.010 ohm/year
Calibration	A UKAS Calibration Certificate can be provided at extra cost
Recommended Current	1mA
Self-heating error at 1mA	0.004°C
Overall dimensions	Refer to Chart
How to Order	Please Specify Model Type and Termination Option (for example 935-14-13/BW) Please state whether UKAS Certification is required

Termination Options

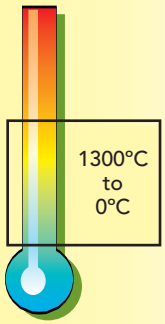
BW Bare Wire

TTI Lemo Connector to suit TTI-5, TTI-6, TTI-7

DB Connector for Dry Block Calibrator Site Indicator

For independent use (without Dry Block Calibrator) please refer to Databook 5 for Calibration ranges and uncertainties

Semi-Standard
Thermocouples



Semi-standard thermocouples without cold junction.

This range is based on our popular standard thermocouples. We receive many requests for different sizes, length and thermocouple materials. From our experience in calibration Isotech have been able to select those thermocouple combinations and sizes which give the best and most stable results.

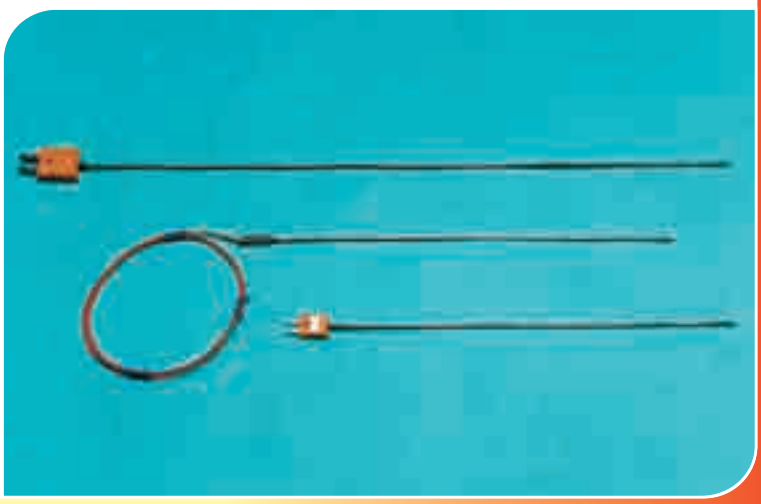
Below is an extract from Isotech's UKAS schedule that shows the laboratory's best capability to calibrate thermocouples. The uncertainty of a particular thermocouple will depend on factors including how it is calibrated. System uncertainties will also vary with which indicator and calibration bath that the sensor is used with. Most of the products shown here include system uncertainty graphs; please contact Isotech for details of any combination not shown. There is also a range of laboratory grade and standard thermocouples, Databooks 1 and 2.

These semi-standards do not have a cold-junction. This feature is usually incorporated in the indicator to which the semi-standard is connected. We offer the type N, R or S semi-standards either with 1 meter leads, with standard plug or miniature plug.

Item	*Measured Quantity Instrument or Gauge*	*Temperature Range*	*(k=2) Best measurement capability expressed as an uncertainty (±)*
1	Temperature Platinum Thermocouples	-50°C to 0°C 0°C to 50°C 50°C to 660°C 660°C to 1100°C Above 1100°C to 1300°C	0.5K 0.45K 0.4K 0.7K 1.7K
2	Other Thermocouples	-196°C -80°C to 300°C Above 232°C to 420°C Above 420°C to 660°C Above 660°C to 1100°C Above 1100°C to 1300°C	0.3K 0.25K 0.3K 0.4K 0.8K 2.2K
3	Compensating and Extension cable	-25°C to 200°C	1K

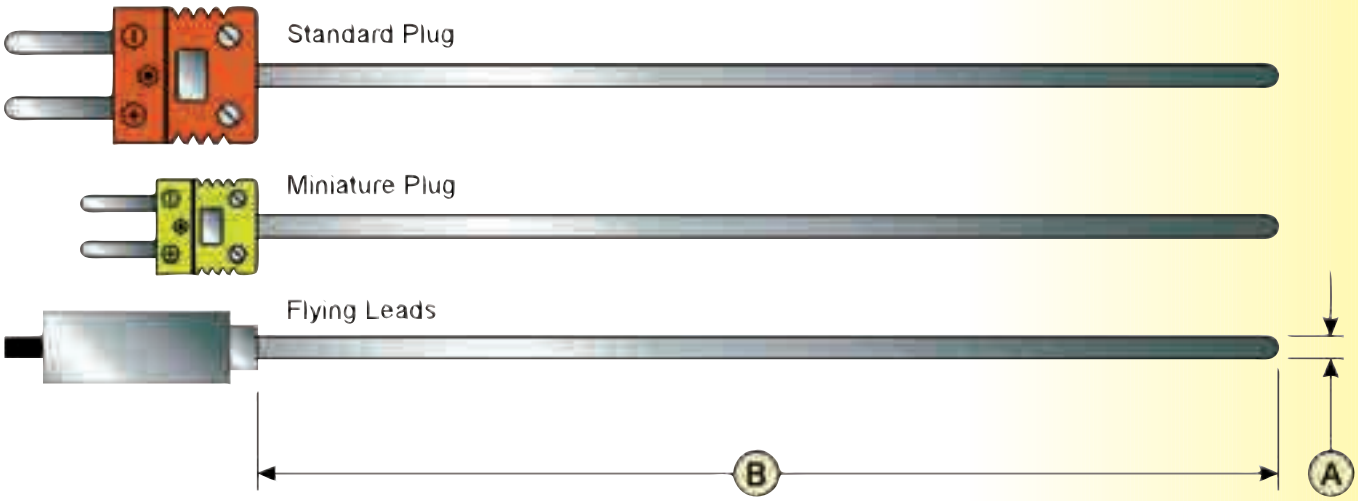
Key Features

- **Type N and Noble metal thermocouples give the best long life, stability and reproducibility.**
- **No Hysteresis.**
- **Wide temperature range.**
- **Ideal for all Industrial applications.**
- **Minimum uncertainties in many of our Industrial products.**
- **Can be supplied with UKAS Calibration.**



Semi-Standard

Thermocouples



Model No.	Diameter (A)	Length (B)	Termination	Range (°C)	Application	Type
935-14-91	5mm	300mm	1M Cable Miniature Plug	0 to 1300°C	Pegasus	R*
935-14-88	5mm	300mm	1M Platinum Cable	0 to 1300°C	Higher Accuracy	R*
935-14-63	3mm	300mm	1M Cable Miniature Plug	0 to 1300°C	Gemini 700 Jupiter 650	N
935-14-64	3mm	300mm	Miniature Plug	0 to 1300°C	General Purpose	N
935-14-65	3mm	300mm	Standard Plug	0 to 1300°C	General Purpose	N
935-14-66	3mm	500mm	1M Cable Miniature Plug	0 to 1300°C	General Purpose	N
935-14-67	3mm	500mm	Miniature Plug	0 to 1300°C	General Purpose	N
935-14-68	3mm	500mm	Standard Plug	0 to 1300°C	General Purpose	N

** Type S available to special order*

Model No.	Refer to Chart
Temperature Range	Refer to Chart
Calibration	A UKAS Calibration Certificate can be provided at extra cost
Overall dimensions	Refer to Chart
How to Order	Please Specify Model Type (for example 935-14-65) Please state whether UKAS Certification is required

For independent use (without Dry Block Calibrator) please refer to Databook 5 for Calibration ranges and uncertainties

Semi-Standards

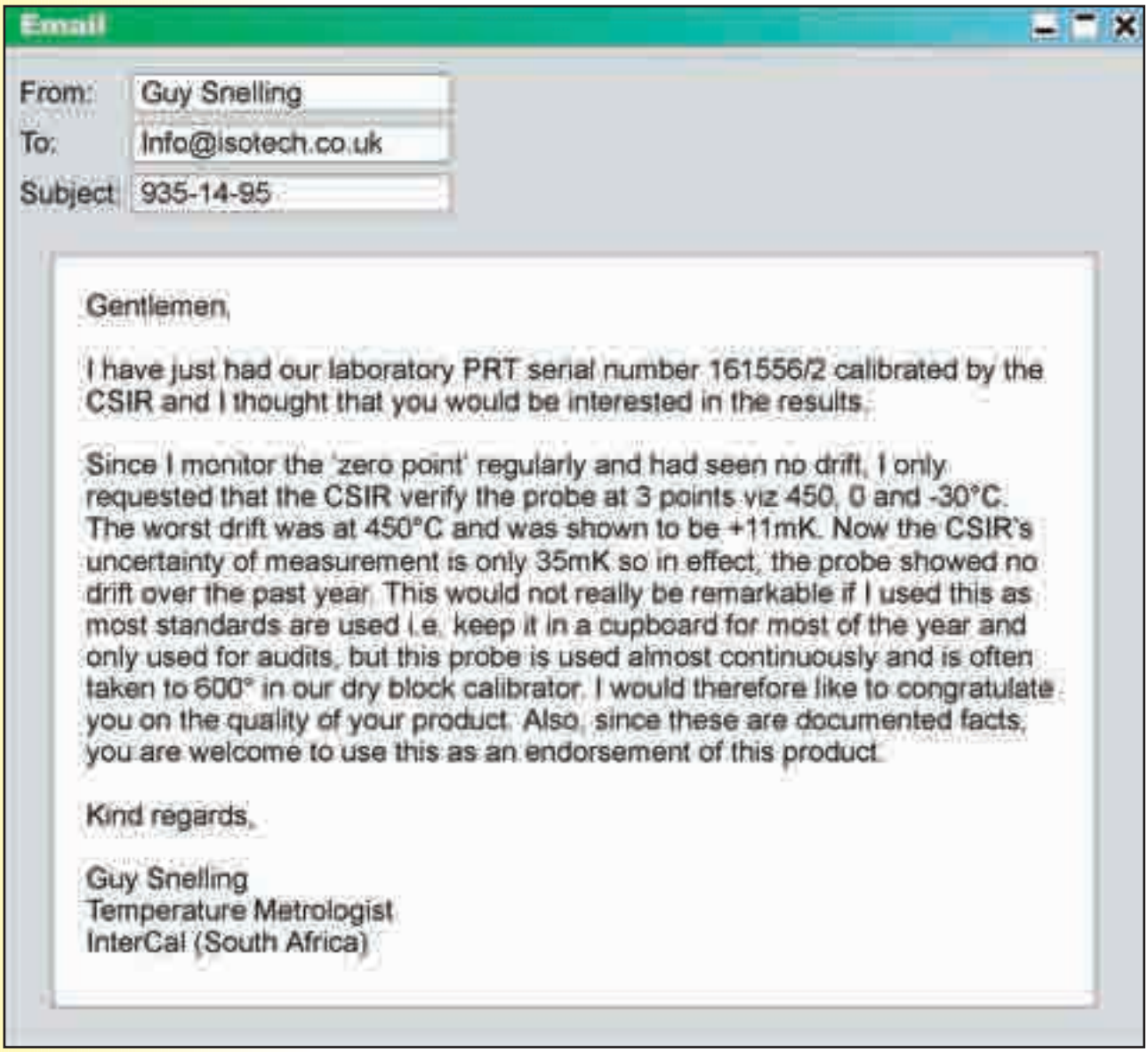
Documentation

Isotech have generated a long history of many of our semi-standards.

Here are a few documented facts:

The 935-14-95 model has the widest temperature range and in consequence is likely to suffer the largest changes in characteristics.

Guy Snelling sent the following email about the 935-14-95.



Email

From: Guy Snelling

To: Info@isotech.co.uk

Subject 935-14-95

Gentlemen,

I have just had our laboratory PRT serial number 161556/2 calibrated by the CSIR and I thought that you would be interested in the results.

Since I monitor the 'zero point' regularly and had seen no drift, I only requested that the CSIR verify the probe at 3 points viz 450, 0 and -30°C. The worst drift was at 450°C and was shown to be +11mK. Now the CSIR's uncertainty of measurement is only 35mK so in effect, the probe showed no drift over the past year. This would not really be remarkable if I used this as most standards are used i.e. keep it in a cupboard for most of the year and only used for audits, but this probe is used almost continuously and is often taken to 600° in our dry block calibrator. I would therefore like to congratulate you on the quality of your product. Also, since these are documented facts, you are welcome to use this as an endorsement of this product.

Kind regards,

Guy Snelling
Temperature Metrologist
InterCal (South Africa)

Semi-Standard

Documentation

The most severe test of a thermometer is to cycle it from its minimum temperature of use to its maximum temperature.

Below is tabulated the annealing drifts of a typical 935-14-95.

Annealing Range - 0°C to +670°C

with 4 hour dwell at 670°C

Cycle Number	Shift (mK)
1	-0.8
2	-2.2
3	+0.5
4	-0.5
5	-2.3
6	-1.2
7	-0.2
8	+0.6

Total Shift over 8 Cycles: -6.1mK

Mean Shift per Cycle: -0.76mK

Selector Switch

8 Way Selector Switch

Isotech produces two eight way selector switches, one for resistance thermometers Model 954 and Model 958 for thermocouples. These switches have been designed for use with a model from our TTI range.

The switches allow easy selection of connected sensors. They can be operated from either the front panel switch or from an RS232 interface that is provided as standard. Channel status is indicated via front panel LEDs. The Selector switches can be located adjacent to the sensors being calibrated, giving more flexibility than a permanently connected or stacked system.

The PRT Switch has 4mm Terminal Posts that can accept bare wires or 4mm plugs. The thermocouple switch has eight miniature thermocouple connectors. These thermocouple connectors are thermally bonded to a platinum resistance thermometer that measures the temperature of the connector and hence the "cold junction". The TTI range temperature indicators feature the ability to measure a remote cold junction and this permits a mixture of thermocouple types to be connected through the box.

The I-Cal software supports Switchbox models 954 and 958 and, for automatic operation, two boxes can be connected together with a "master / slave" lead allowing them to be controlled from a single RS232 port and up to 16 sensors to be switched. The software can automatically switch between the boxes and connect the appropriate output to the TTI. This 16 channel operation is not convenient without the software and manual operation of two boxes together is not recommended. See DataBook 2 for a 16 channel manual switch, the Model 947.

Advantages

- **Use with TTI-6 and TTI-7 easily switch up to eight sensors manually or with RS232.**
- **RTD and Thermocouple Models.**
- **Use with I-Cal Software for automatic switching and temperature calibration, add a second box (either type) to calibrate up to 16 Sensors.**
- **Switches are stand-alone allowing them to be positioned anywhere in a laboratory for most efficient operation.**

Selector Switch

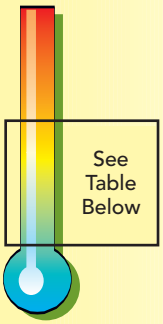
8 Way Selector Switch

Model No.	954 RTD Selector Switch
Channels	Eight - four wire (four pole)
Control	Front panel switch And RS232 (Also compatible with Isotech VLT system)
Connectors	4mm Terminal post
Internal Circuit Resistance	<250mΩ
Thermal EMF, typical	2µV after 1 minute of channel set 6µV after 30 minutes of channel set
Power	5 VDC 100-250 VAC, 50 / 60Hz Power Supply Included
Overall dimensions	Height 91mm Width 141mm Depth 165mm
Weight	1kg
How to Order	954 RTD Selector Switch

Model No.	958 TC Selector Switch
Channels	Eight - two wire (two pole)
Control	Front panel switch And RS232 (Also compatible with Isotech VLT system)
Connectors	Miniature Thermocouple Connectors
Internal Circuit Resistance	<250mΩ
Thermal EMF, typical	2µV after 1 minute of channel set 6µV after 30 minutes of channel set
Reference Junction Measuring Device	100Ω 1/10 Din Pt100
Thermal Coupling	<0.2°C* *Basis of test. At ambient 20°C ±2°C the internal Pt100 agreed with the connected thermocouples to ±0.2°C (including all measurement errors) using IEC584-1995 and IEC751-1995. The uncertainty of this test was ±0.3°C which includes the reproducibility of the test thermocouples.
Power	5 VDC 100-250 VAC, 50 / 60Hz Power Supply Included
Overall dimensions	Height 64mm Width 141mm Depth 165mm
Weight	1kg
How to Order	958 TC Selector Switch

836 Resistor

Miniature Fixed Resistor



Isotech produces a miniature resistor with ultra-low temperature coefficient and ultra-high stability.

This is achieved because the resistors are oil filled and hermetically sealed.

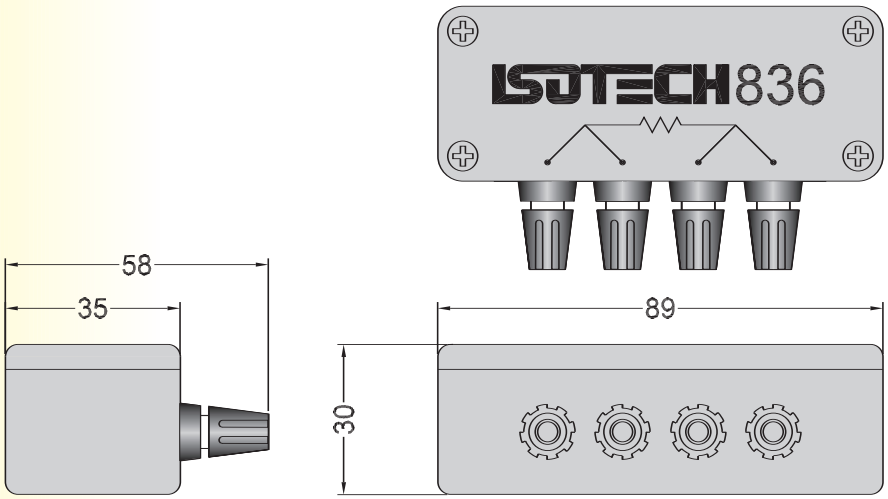
The function of hermetic sealing is to eliminate the ingress of moisture and oxygen both of which play a role in both short and long term degradation of unsealed resistors. A further enhancement in both short and long term stability is achieved by oil filling. The oil also acts as a thermal conductor allowing the device to accept short periods of overload without degradation.

With accuracies of ±0.005%, resistance range from 5 ohms to 3.3 megaohms and long term drift of less than 5ppm, these devices are virtually secondary standards that can be carried in sets for daily or periodic calibration of factory systems.

RESISTANCE VALUES

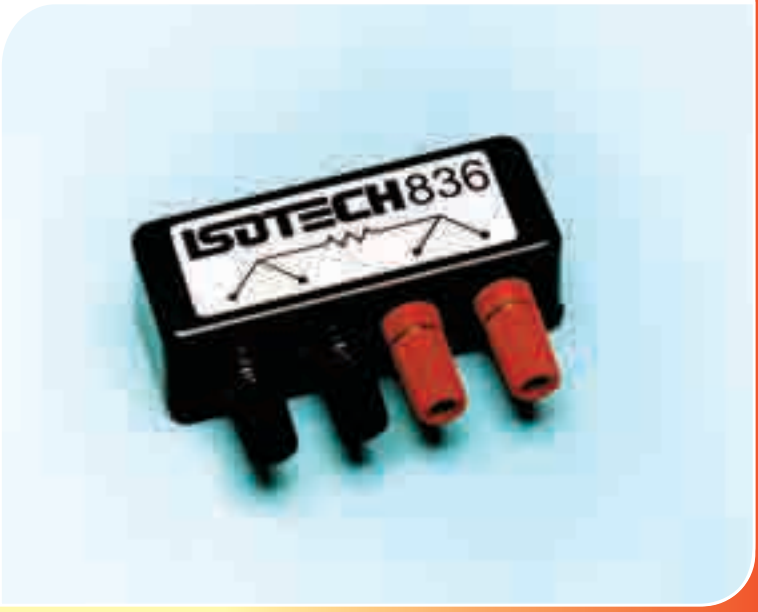
We can supply the value you choose ±0.1% between a minimum of 5 ohms and a maximum of 3.3 megaohms. However we bulk buy and keep in stock the following standard values:

10Ω, 25Ω, 100Ω, 1000Ω, 10,000Ω



Key Features

- **The most precise and stable resistors available for Industrial laboratories.**
- **Impervious to harmful environments - oil filled.**
- **Nominal temperature coefficients of resistance -** +0.6ppm/°C (0°C to +25°C); -0.6ppm/°C (+25°C to +60°C).
- **Power Rating - 0.5 watt at +25°C.**
- **Resistance tolerance -** (initial resistance accuracy): ±0.005%.



836 Resistor

Miniature Fixed Resistor

UKAS CALIBRATION

For the highest quality traceability we recommend that the 836 be UKAS Certified.

Measured Quantity Instrument or Gauge Range	*Frequency*	*Best measurement Capability expressed as an Expanded Uncertainty (k=2)*
DC RESISTANCE		
0.1 Ω to 10 Ω		±10ppm
10 Ω to 250 Ω		
250 Ω to 1000 Ω		±20ppm
1 KΩ to 1 MΩ		±55ppm
1 MΩ to 10 MΩ		
AC RESISTANCE		
2.5 Ω to 400 Ω	75 Hz	±15ppm
400 Ω to 1000 Ω	75 Hz	±100ppm

Model No.	836 Miniature Fixed Resistor
Power Rating	0.5 watt
Nominal Temperature Coefficient of Resistance	+0.6ppm/°C (0°C to +25°C) -0.6ppm/°C (+25°C to +60°C)
Resistance Tolerance	(Initial Resistance Accuracy) ±0.005%
Resistance Range	5 ohms to 3.3 megaohms
Current Noise	<0.010µV (RMS) / Volt of applied voltage
Thermal EMF	0.1µV/°C maximum 0.05µV/°C typical
Connections	Screw Terminal Posts
Stability	Typically 1ppm per year at 1mA
Overall dimensions	Height 30mm Width 89mm Depth 58mm (including terminals)
Weight	90g
How to Order	836 Miniature Fixed Resistor Please state Ohms Value Required Please state if UKAS Certification is required

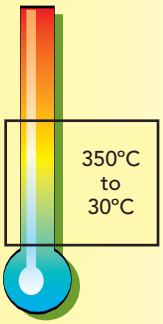
Please Note:

We offer other Resistor Ranges including the models 456, the SRA and the SRB ranges.

For more information please contact Isotech, or visit our website www.isotech.co.uk

944 True Surface

Temperature Measurement System



The fundamental problem with surface temperature measurement is that it is subject to large stem conduction errors, also because heat conducted from the surface of the hot-plate causes a localised cold spot to be created which means that the temperature indicated by the hot plate is not necessarily the temperature at the point of measurement.

An ideal system would not disturb the heat-flux from the hot-plate.

During 1993 such a system was described (ref. "Progress in Contact Thermometry" 1993 B. D. Foulis) and Isotech have the inventors permission to make and market the device World-wide.

Principal of Operation

A fine wire type N thermocouple is used as the surface temperature sensor, a second junction 2 to 3mm along the thermocouple, senses the temperature difference due to heat flux along the sensor. A heater heats the thermocouple stem until the temperature gradient is zero, thus creating a measurement without stem conduction, or disturbance of the hot-plate's surface.

The 944 can be used with the Isotech Small Hot Plate model 983, see the fast calibrator section. A traceable calibration certificate is available to order.

Key Features

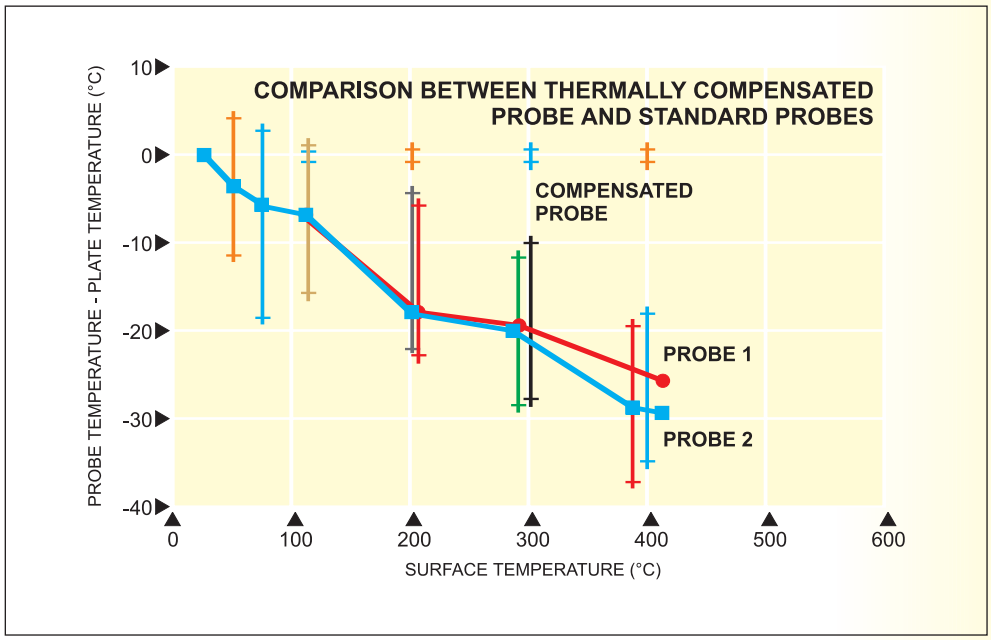
- **Indicates true surface temperature measurements digitally to a resolution of 0.1°C or 0.1°F.**
- **Temperature range of 30°C to 350°C.**

Hotplate not included.
For Hotplate see the Fast Calibrator section.

944 True Surface

Temperature Measurement System

True surface temperature measurements



Model No.	944 True Surface Temperature Measurement System
Temperature Range	30°C to 350°C
Resolution of display	0.1°C or 0.1°F
Stability	±1°C
Accuracy	±2°C with TRACEABLE Certification ±5°C without Certification
Probe Assembly	Probe Diameter 7.5mm Probe Length 150mm Lead Length 850mm
Power Supply	100V - 120V, 50 / 60Hz or 200V - 240V, 50 / 60Hz
Overall dimensions	Height 90mm Width 153mm Depth 265mm (excluding plugs)
Weight	4kg
How to Order	Model 944 & Probe 935-14-81 Please state supply voltage required Please state if Calibration is required

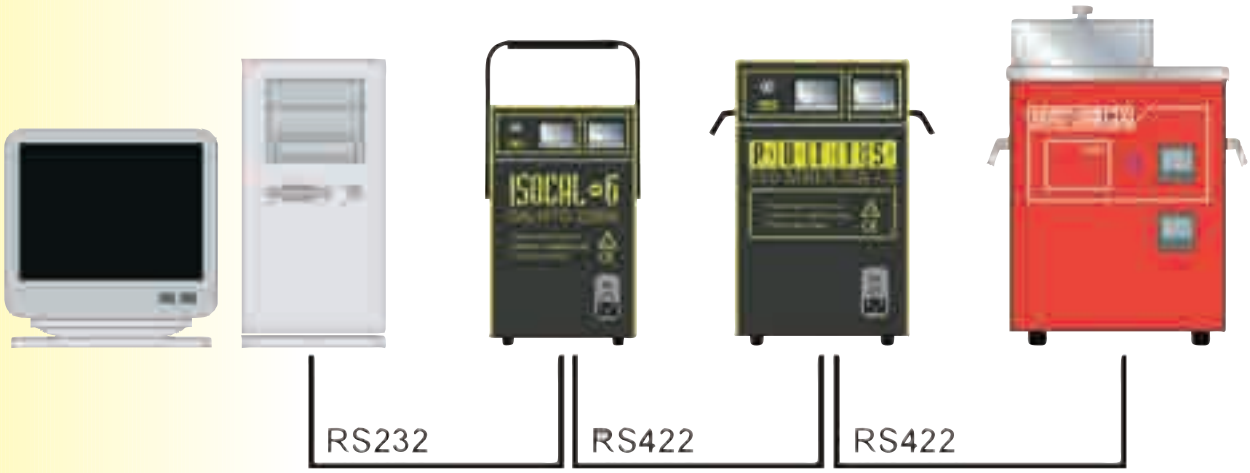
Software

Introduction

The Dry Block Calibration Baths included in this DataBook have been enhanced to feature serial communications as standard. The baths have a serial interface (RS422) as standard, this allows a number of calibration baths to be connected together in a daisy chain.

A special lead assembly is provided which converts the RS422 to a PC's standard RS232 port.

This innovative approach allows you a simple trouble free way of connecting a number of baths to a single PC's RS232 port



Software

Isotech software provides ease of use and routes to fully automatic temperature calibration.

CalNotePad

Included as standard with the calibration baths and TTI indicators. This permits you to connect both an indicator and the calibration bath to the PC. You can view data on clear configurable chart displays, log data to file and control the calibration bath.

I-cal

A software application that can automatically calibrate up to 16 temperature sensors, it provides an expandable low cost route to automatic calibration – with I-cal Capture you can store pictures (along with time and temperature data) to enable, for example, dial thermometers to be calibrated automatically; return to a set of images of the dial captured at each calibration temperature!

New I-CAL easy

Use I-cal Easy to automate the equipment in the lab, enter up to 20 calibration points and let the software set the bath wait for stability and log the data. Choose the stability criteria and how many points to record at each calibration temperature.

I-cal easy lets you use a built-in template or design your own certificate. Add text, data fields and graphics on a single or multiple pages. Then publish the calibration data to the certificate. Do you want to include or calculate coefficients? Then drag your data to the ITS-90 or Calender Van Duesen calculators. Also included is a powerful regression calculator.

Other systems have limited the user with a built in template and the need to pay extra for any changes. With I-cal Easy just build in your own certificate in minutes!

Please try the demo version, we would like you to see for yourself.

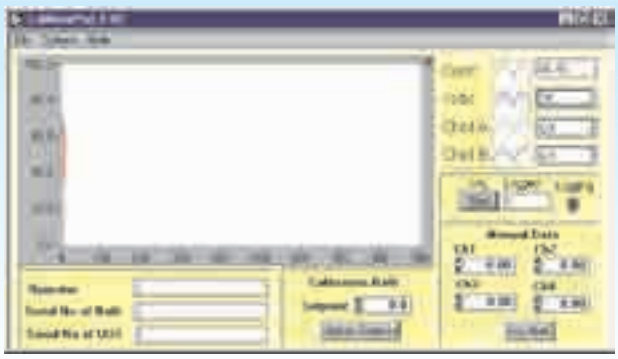
Software

Introduction

Comparison Chart	Cal NotePad	I-Cal	I-cal Capture	I-cal Easy*
Included with Isotech Equipment	Yes	No	No	Demo
Monitor and Record Data	Yes	Yes	Yes	Yes
Automatic Sensor Calibration	No	Yes	Yes	Yes
Maximum Number of Sensors	N/A	16	16	32
Save Results to file	Yes	Yes	Yes	Yes
Capture Images with Camera	No	No	Yes	Yes
Print Certificates	No	No	No	Yes
Design Custom Certificates	No	No	No	Yes
Calculate Coefficients to IEC 751	No	No	No	Yes
Calculate Coefficients to ITS-90	No	No	No	Yes
Regression Calculation	No	No	No	Yes

**See www.isotech.co.uk/software.html for a version of I-Cal Easy that interfaces to third party instruments.*

Photograph of I-Cal being used with a Gemini 700 Dry Block Calibrator and PC



Screenshot of Cal NotePad

Note:
Free software for Industrial PRTs PRTCalc download from www.isotech.co.uk

Cal NotePad

Software

The purpose of Cal NotePad (CNP) is to automatically log and display the temperature of an Isotech calibration bath together with the unit under test. Cal NotePad can be used with baths (or indicators) without PC interfaces by the user typing in values from the keyboard. The Cal NotePad can be used to identify the operator and the unit under test. With the click of a button data is logged with time information, it is also possible to log continually.

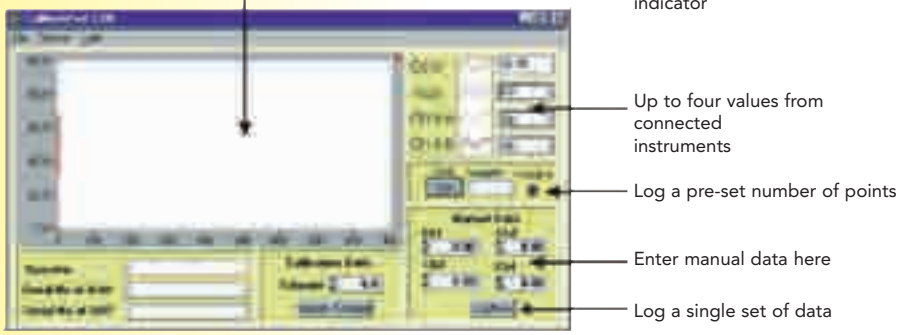
The calibration bath temperature can be changed from the PC or from the calibration bath's controller - Cal NotePad will display the temperature changes as they occur on the rescaleable chart display.

For traceable calibration the unit under test should be compared to a calibrated standard thermometer. Cal NotePad can record the actual temperature of the bath from either the in-built indicator of an Isotech SITE model or from a variety of external instruments – see list. If the external instrument has two channels (e.g. Isotech TTI) then the unit under test may be connected to channel B for logging with CNP. Alternatively the value can be typed in from the keyboard. Similarly the calibration bath controller value, actual temperature, SITE indicator value or unit under test value may also be entered manually.

Then the manually entered data is combined with that gathered automatically and the resultant file can be opened in an external application such as Excel* for the preparation of reports, certificates etc.

Cal NotePad is designed for ease of use, it will give a chart of the system. When the operator determines the system is stable - easily seen from the chart then clicking a button will record time, operator, serial numbers of unit under test along with controller and indicator values.

Cal NotePad can be used for semi-automatic calibration, see I-cal for a fully automated calibration solution.



System Requirements

- CNP requires a PC with Windows 98/200/XP
- CNP is compatible with the following Isotech calibration equipment:-

Isotech Dry Block Baths with RS232 or RS422 including:- Venus 2125 + 2150, Gemini 550 + 700, Jupiter 650, Venus, Gemini, Jupiter, Pegasus LAB models, ISOCAL-6 models with RS232 or Rs422

Isotech's Professional Comparison Baths with RS232 or RS422 - most models supported including:- Fluidised Furnace, Spherical Furnace, 915 + 814 Liquid Baths

Temperature Indicators:- Isotech T.T.I.1, Isotech T.T.I.2, Isotech T. T. I. 5, T.T.I.6 and Isotech T.T.I.7

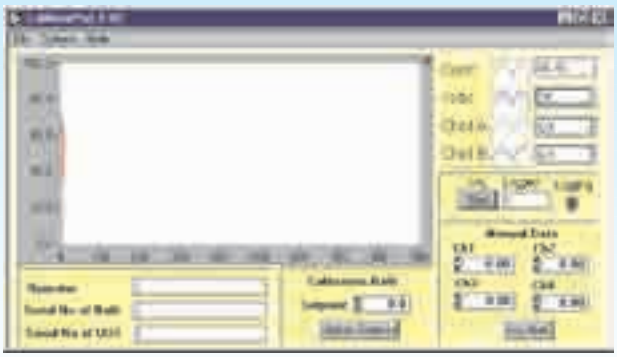
In addition the following third party instruments are supported:- Labfacility Tempmaster, Labfacility Labcal +, Fluke 45 DVM, in built conversion for type K, J, E, R, S, T, N, B (external CJC required) or Volts/Ohms display, Cropico, 3000 Series, and similar models with the same command protocol, e.g. ASL F150, Tinsley 5885 etc.

Manual Entry:- Any instrument data can be typed into Cal NotePad.

Key Features

- **Included with the PLUS models, the Isocal-6 range and Dry Block Calibrators.**
- **Provides Sophisticated Real Time Chart Display.**
- **Record Isotech Calibration Bath and Indicator Data.**
- **Export data for Excel, Word, etc.**

How to Order Cal NotePad
Supplied on 3.5" disks with a comprehensive manual.



I-Cal

Software

I-cal is a software application designed for automatic temperature calibration using Isotech products. It is affordable, easy to use and modular. In the simplest form it can be used with a SITE Dry Block Calibrator to automatically calibrate a single sensor against the block temperature. To calibrate multiple sensors simply add an Isotech Selector Switch - there are two models; one for up to eight resistance thermometers and one for up to eight thermocouples. You can have a total of two boxes, any combination, to calibrate up to 16 sensors!

I-cal also supports the TTI6 and TTI7 indicators and with these you can easily build an automatic calibration system to calibrate up to 16 sensors on the TTI's channel B, with a standard probe on channel A. The calibration results are saved to a text file that can be opened in your preferred application to create a certificate or report.

I-cal CAPTURE is suitable for the automatic calibration of hand-held thermometers and similar devices. Previously hand-helds could not be easily calibrated automatically because most models do not have provision for a connection to a PC. I-cal CAPTURE solves this by using a low cost camera. I-cal, as usual, monitors the dry block bath / standard for stability, it then grabs an image before setting the bath to the next temperature. The image is captured with the date and time to make a complete visual record (as shown).

Minimum System Requirements

- Desktop or Notepad PC
- 166Mhz Pentium Processor with mmx or greater
- 32Mb Ram
- 800 x 600 / 16 bit display

I-Cal	Windows 98/2000/XP
I-Cal Capture - Supported Camera	Check with ISOTECH for supported models. 150Mb free hard disk space
Serial Ports	A maximum of three ports are required, one for the dry block, one for the TTI and one for the switchboxes (Two switchboxes can be operated from a single port)

A caption is added showing dates, time and the standard temperature.

Key Features

- **Use ISOTECH equipment to automatically calibrate temperature sensors**
- **Affordable and Expandable -** A Selector Switch and or True Temperature Indicator can be added to the Dry Block at any time
- **Calibrate up to 16 sensors -** Use two switchboxes to calibrate up to 16 sensors at up to 10 temperatures
- **Save Time -** Set I-Cal going, go home and return to the calibration results!
- **Results saved to Text File -** the calibration results are stored to a text file for you to process
- **I-Cal CAPTURE can save images -** of devices like handheld thermometers that can be connected to the PC

How to Order I-Cal
I-Cal CAPTURE

I-Cal Easy

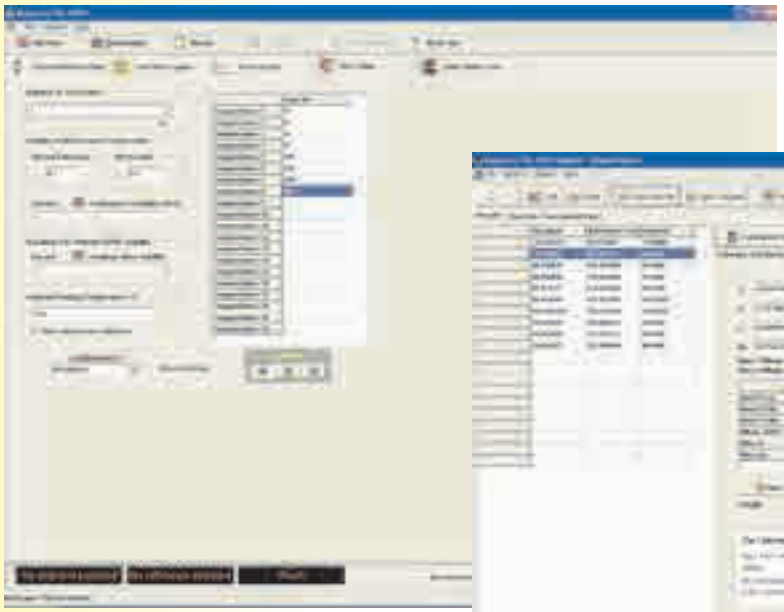
Software

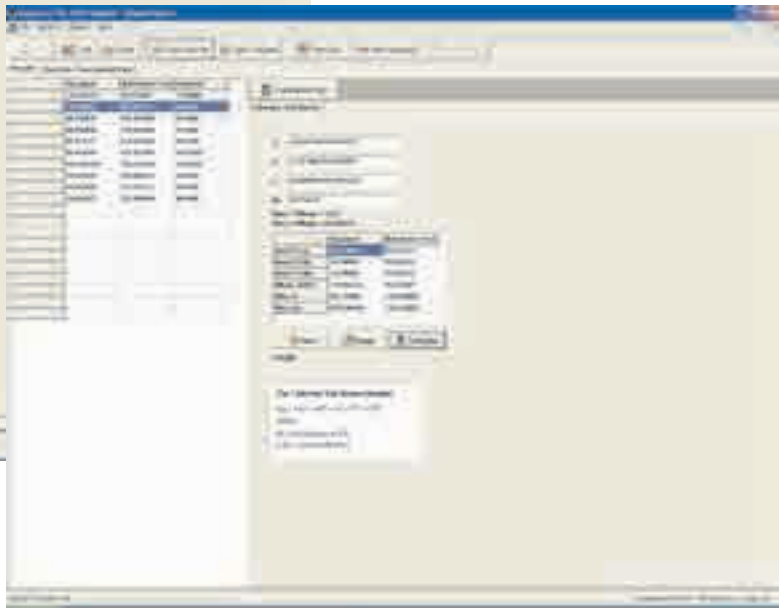
Use I-cal Easy to automate the equipment in the lab, enter up to 20 calibration points and let the software set the bath wait for stability and log the data. Choose the stability criteria and how many points to record at each calibration temperature.

I-cal Easy lets you use a built-in template or design your own certificate. Add text, data fields and graphics on single or multiple pages, then publish the calibration data to the certificate. Do you want to include or calculate coefficients? Then drag your data to the ITS-90 or Calender Van Duesen calculators. Also included is a powerful regression calculator.

Other systems have limited the user with a built-in template and the need to pay extra for any changes, with I-cal Easy just build in your own certificate in minutes!

Please try the demo version, we would like you to see for yourself, http://www.isotech.co.uk/software.html





New

Key Features

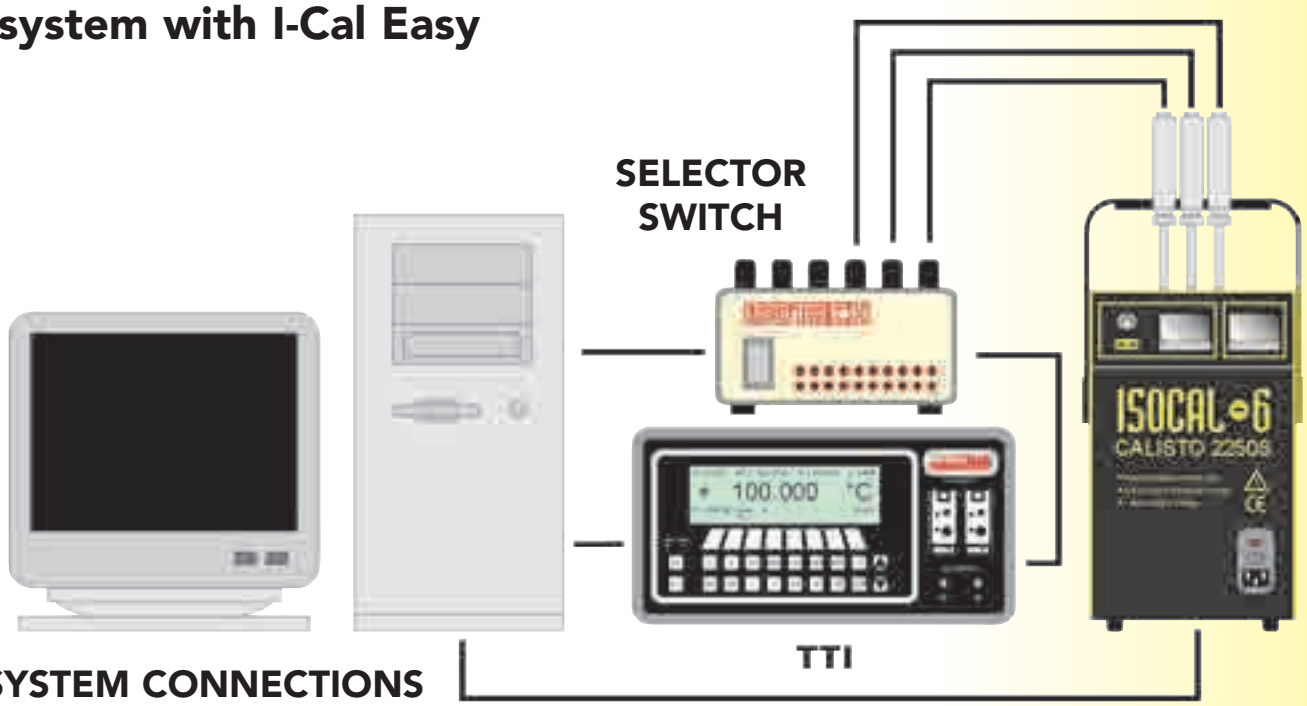
- **Fully Automatic Calibration**
- **Design and Print Certificates**
- **Calculate Coefficients**
- **More channels**
- **Supports more equipment**
- **Try the full version free for 30 days**

How to Order I-Cal Easy

I-Cal Easy

Software

Build an automatic calibration system with I-Cal Easy



SYSTEM CONNECTIONS

I-cal Easy supports the TTI-7 and Isotech Dry Blocks, Liquid Baths and Calibration Furnaces. Additional support for other and third party instruments is available, contact Isotech for details.

I-cal Easy provides a powerful but easy to use automatic calibration system. A graphical setup lets you drag and drop instruments and equipment onto the appropriate PC port - no need to create config files. In addition to the comprehensive manual balloon tips guide you as to the operation of each control. Once familiar with the system this balloon help feature can be turned off.

The criteria for stability can be set to suit all types of equipment; Dry Blocks, Liquid Baths and High Temperature Furnaces. Once the system is stable choose how many measurements to take at each calibration point and have the average value appear on the certificate. Create one or multiple page certificates, as many as required to suit different customers and different types of calibration, thermocouple, Industrial PRTs and SPRTs. Drag and drop data and text fields onto the certificate, link to logos and other graphic elements.

The in-built calculator will calculate coefficients for both IEC 751, ITS-90 and for thermocouples you can choose what order of regression to fit an error curve. Try the demo version and see how easy it is to drag data to the calculator and export the results straight to a certificate.

Judge for yourself how this compares to any other software. The demonstration version will run without restriction for 30 days and enable you to learn how to use I-cal Easy and save time by rapidly producing certificates to your own requirements. Try it and see why we are confident that I-cal Easy is the market leader.

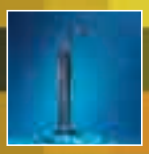
Note: Available in different languages - check the website for details.

Minimum System Requirements

- Desktop or Notepad PC
- 800 X 600 / 16 bit display (1024 X 768 recommended)

OS	Windows 98/2000/XP
I-Cal - Supported Camera	Check with ISOTECH for supported models
Serial Ports	A maximum of three ports are required, one for the dry block, one for the TTI and one for the Switchboxes (Two Switchboxes can be operated from a single port)

databookone
Realising ITS-90




Includes:

- Fixed Point Cells
- Primary Apparatus
- Thermometers
- Instruments & Software

databooktwo
Secondary Laboratory Equipment




Includes:

- Slim Cells
- Secondary Apparatus
- Thermometers
- Instruments & Software

databookthree
Industrial Laboratory Equipment




Includes:

- Metal Block Baths
- Furnaces
- Thermometers
- Instruments & Software

databookfour
Blackbody & Thermocouple Referencing




Includes:

- Blackbody Cells
- Blackbody Cavities
- Blackbody Furnaces
- Thermocouple Referencing

databookfive
Calibration Services & Information



Includes:

- U.K.A.S. Calibration
- Journal of Thermometry
- Video Courses
- Training Courses

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- databookfour ☐
- databookfive ☐

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