

CHOOSING A DRY BLOCK



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CHOOSING A DRY BLOCK

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Part One: Sensor Sizes

[Click Me](#)

Part Two: Temperature Ranges & Features

[Click Me](#)

Part Three: Basic, Site or Advanced

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Part Four: Calibration Options



Part One: Sensor Sizes

What size are the thermometers to be calibrated?



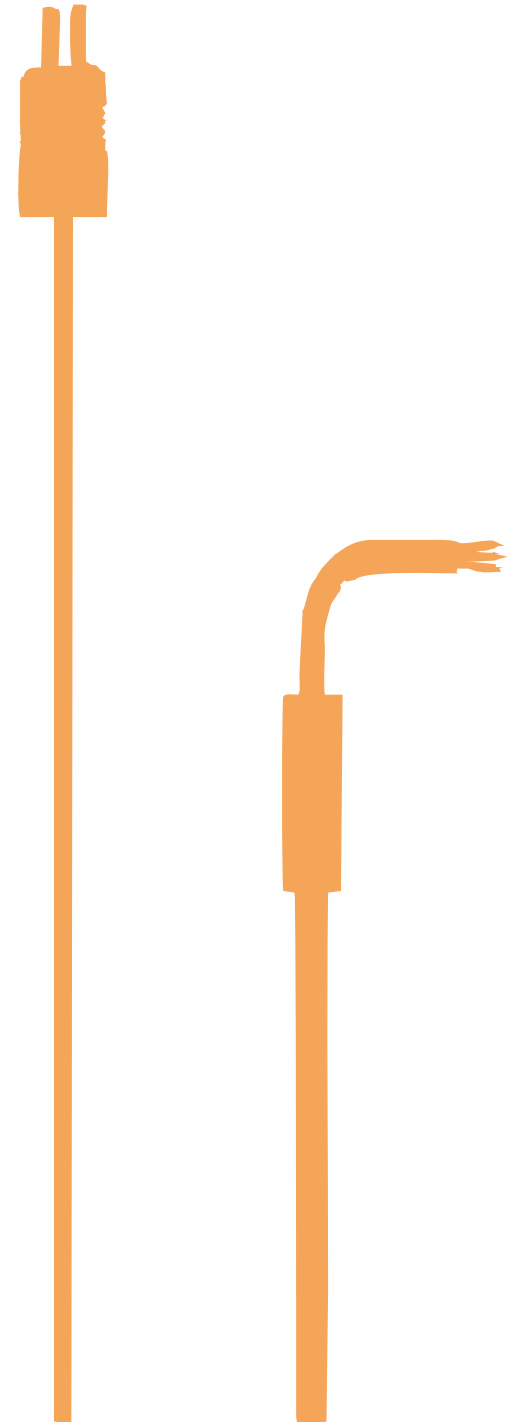
What size are the thermometers to be calibrated?

The Dry Block must have a block large enough and deep enough to suit the test thermometers.



What size are the thermometers to be calibrated?

PRT or RTDs & Thermocouples are commonly calibrated in blocks 140mm to 160mm deep.



CHOOSING A DRY BLOCK

What size are the thermometers to be calibrated?

But other sensor types may demand greater depth.



What size are the thermometers to be calibrated?

Isotech have depths from 115mm to 300mm and diameters from 25mm to 65mm.



CHOOSING A DRY BLOCK

Insert Size

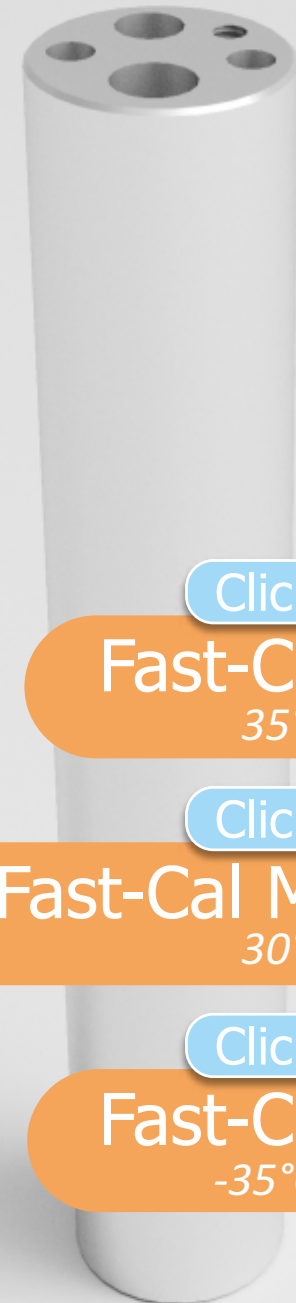
Insert Size - Fast-cal - 25mm x 148mm:

Standard Thermometer Pockets:

2x4.5mm, 1x6.5mm, 1x8mm.
(others to special order)



Fast response highly portable operation



[Click Me](#)

Fast-Cal High
35°C to 65°C

[Click Me](#)

Fast-Cal Medium
30°C to 350°C

[Click Me](#)

Fast-Cal Low
-35°C to 140°C

CHOOSING A DRY BLOCK

Insert Size

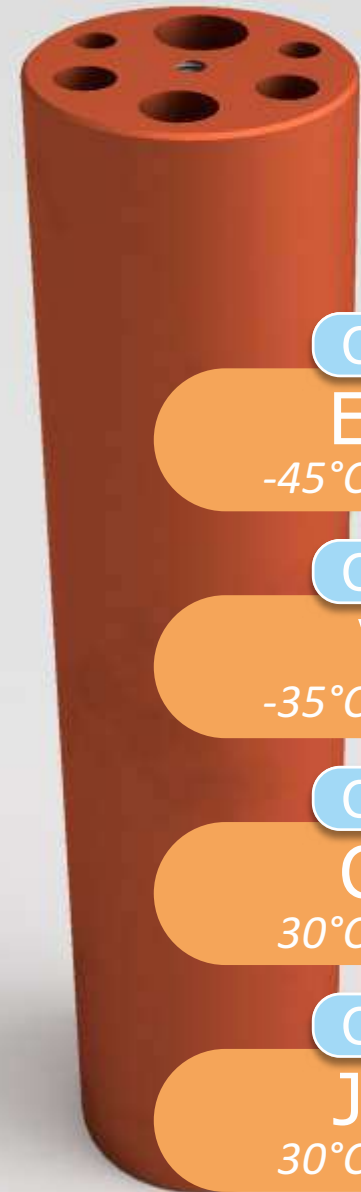
Insert Size - 4000 Range - 35mm x 160mm:

Standard Thermometer Pockets:

2x4.5mm, 2x6.5mm, 1x8mm & 1x9.5mm.
(others to special order)



35mm Diameter for More Pockets
and more features Dry Blocks



[Click Me](#)

Europa

-45°C to 140°C

[Click Me](#)

Venus

-35°C to 140°C

[Click Me](#)

Calisto

30°C to 250°C

[Click Me](#)

Jupiter

30°C to 660°C

CHOOSING A DRY BLOCK

Insert Size

Insert Size - Isotech 65mm Diameter Blocks:

Standard Thermometer Pockets:

Room for many more thermometers
or bigger thermometers - Depth to 160mm.



65mm Diameter for More Pockets
and more features Dry Blocks



[Click Me](#)

Drago
30°C to 250°C

[Click Me](#)

Hyperion
-25°C to 140°C

[Click Me](#)

Gemini
50°C to 700°C

CHOOSING A DRY BLOCK

Insert Size

Insert Size - Isotech "Deep" Blocks:

Standard Thermometer Pockets:

Depth to 300mm x 50mm Diameter.



[Click Me](#)

Medusa 511
50°C to 700°C

[Click Me](#)

Medusa 510
30°C to 550°C

[Click Me](#)

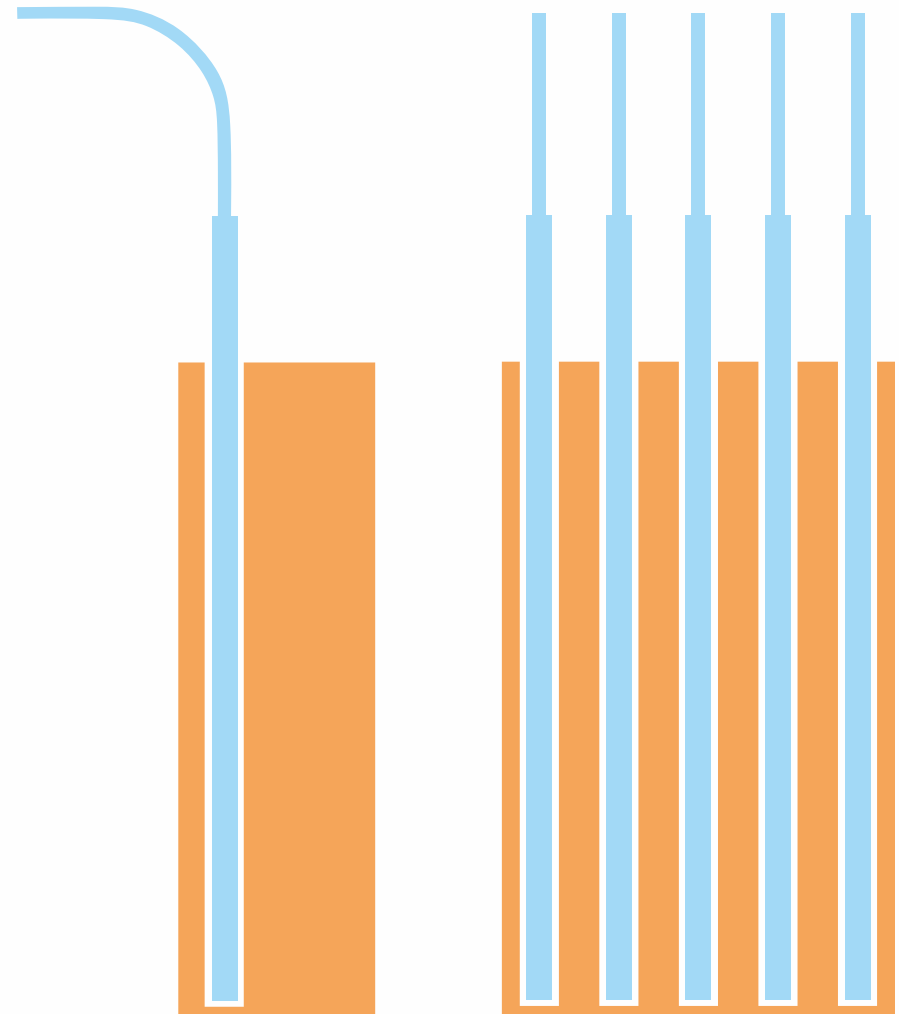
Oceanus-6
-25°C to 140°C

Greater Depth

RESPONSE TIMES

Smaller Blocks like Fast-Cal heat and cool much more quickly than larger blocks.

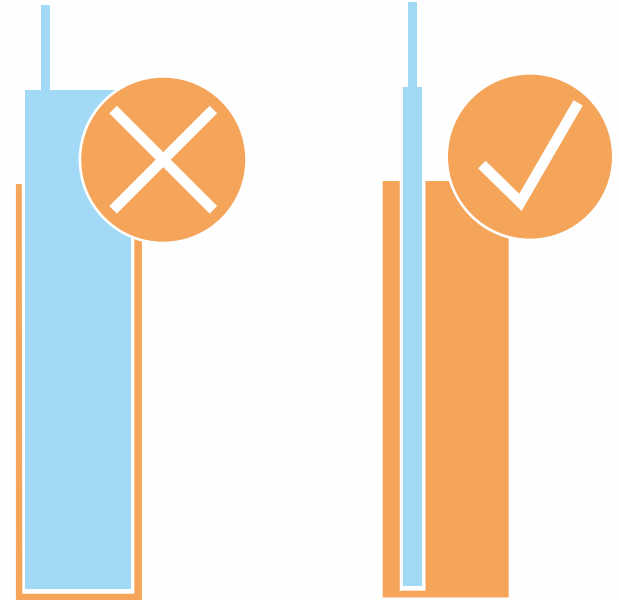
What is more important? Speed of response or ability to calibrate several sensors in one go?



TOP TIPS

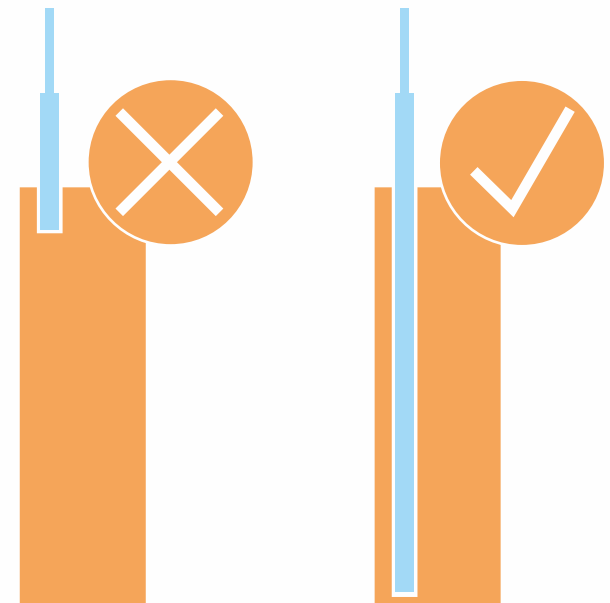
Adequate Thermal Volume

Keep probe or probes small compared to mass of block.



Ensure Good Immersion Depth

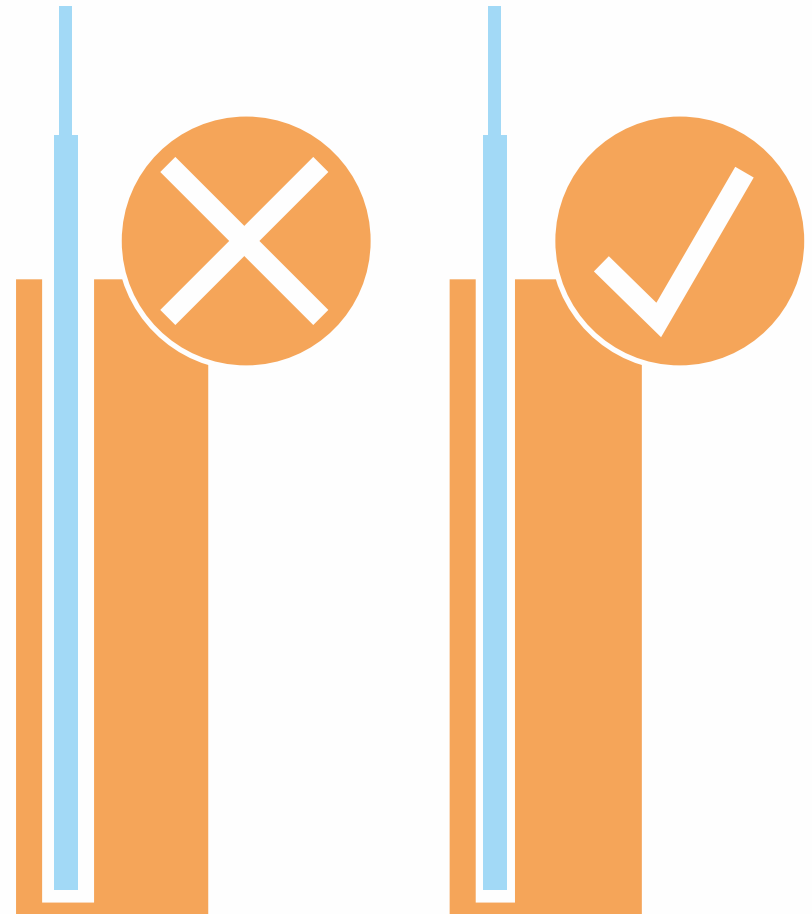
Ensure sensors are sufficiently immersed.



Hole Sizes

Generally make pockets 0.5mm larger than the probe size.

In Dry Blocks - Avoid liquids or other transfer mediums.



Learn More:

More Information About Depth

[Click Me](#)

Search Results for: Documents

[Temperature Calibration; Depths of Immersion](#)

[Industrial Measurements with Very Short Immersion](#)

[Immersion Depth Chart – Dry Block Bath](#)

Part Two: Temperature Ranges & Features

Temperature Range;
and multi functional calibrators.



CHOOSING A DRY BLOCK

What Temperature range needs to be covered?

Portable Dry Blocks can go to negative temperatures and as high as 1200°C.

There are three general categories.



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Peltier Blocks

Models covering -45°C to 140°C



[Click Me](#)

Fast-Cal



[Click Me](#)

4000 Series



[Click Me](#)

Oceanus-6

Peltier Blocks

PROS

- Fast
 - Portable
 - Good Value
 - Multi Purpose
-

CONS

- Limited in maximum temperature



CHOOSING A DRY BLOCK

Isotech Isocal-6 Models

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Surface
Sensor
Calibration



ITS-90
Fixed Point



Liquid
Bath



Ice
Bath



Infrared
Calibrator

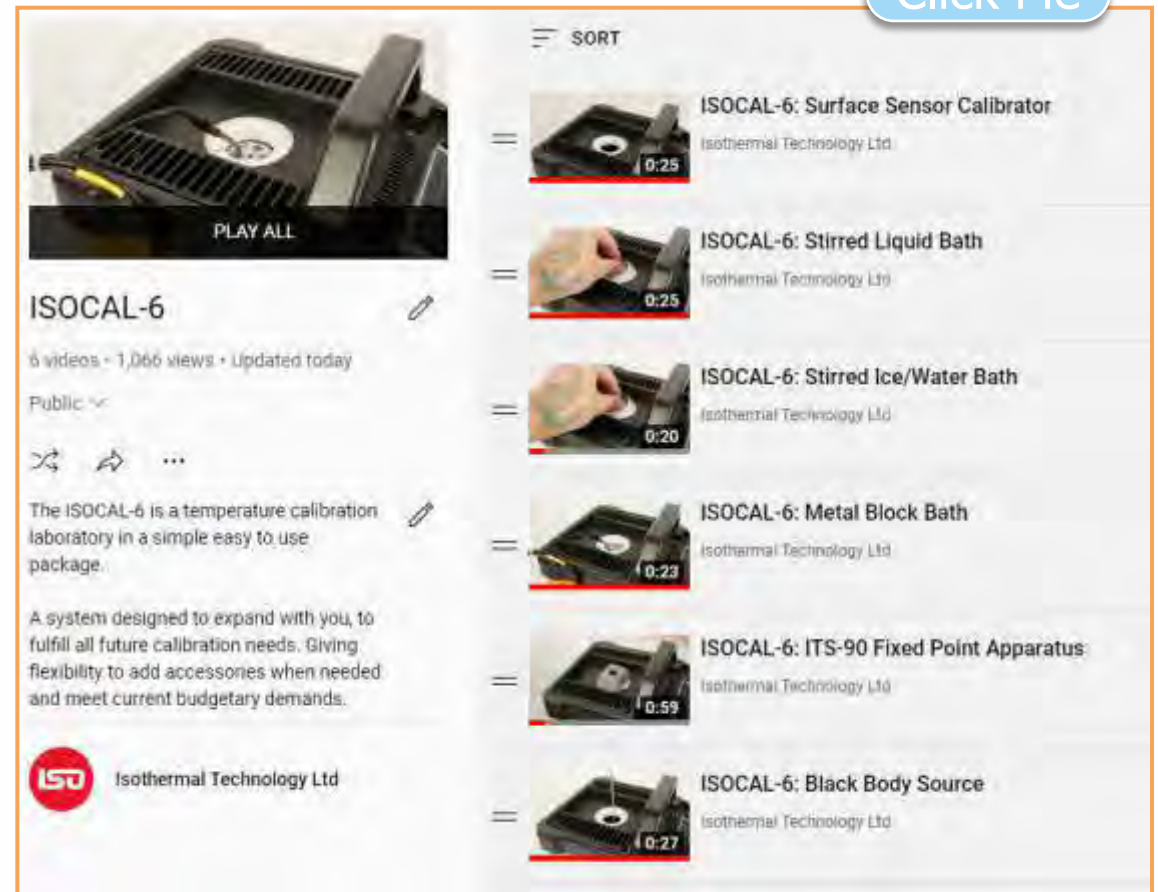


Dry
Block

Isocal-6 Multi Mode operation

- Metal Block Bath
- Liquid Baths
- A Stirred Ice Bath
- Blackbody Sources
- Surface Sensor Calibrators
- ITS-90 Fixed Points

Click Me



The screenshot shows a YouTube playlist for the ISOCAL-6 system. The main video thumbnail shows the device with a 'PLAY ALL' button. Below the thumbnail, the title 'ISOCAL-6' is displayed, along with '6 videos · 1,066 views · Updated today' and 'Public'. A description states: 'The ISOCAL-6 is a temperature calibration laboratory in a simple easy to use package. A system designed to expand with you, to fulfill all future calibration needs. Giving flexibility to add accessories when needed and meet current budgetary demands.' The channel name 'Isothermal Technology Ltd' is visible at the bottom left. On the right, a list of six videos is shown, each with a thumbnail, title, and duration:

- ISOCAL-6: Surface Sensor Calibrator (0:25)
- ISOCAL-6: Stirred Liquid Bath (0:25)
- ISOCAL-6: Stirred Ice/Water Bath (0:20)
- ISOCAL-6: Metal Block Bath (0:23)
- ISOCAL-6: ITS-90 Fixed Point Apparatus (0:59)
- ISOCAL-6: Black Body Source (0:27)

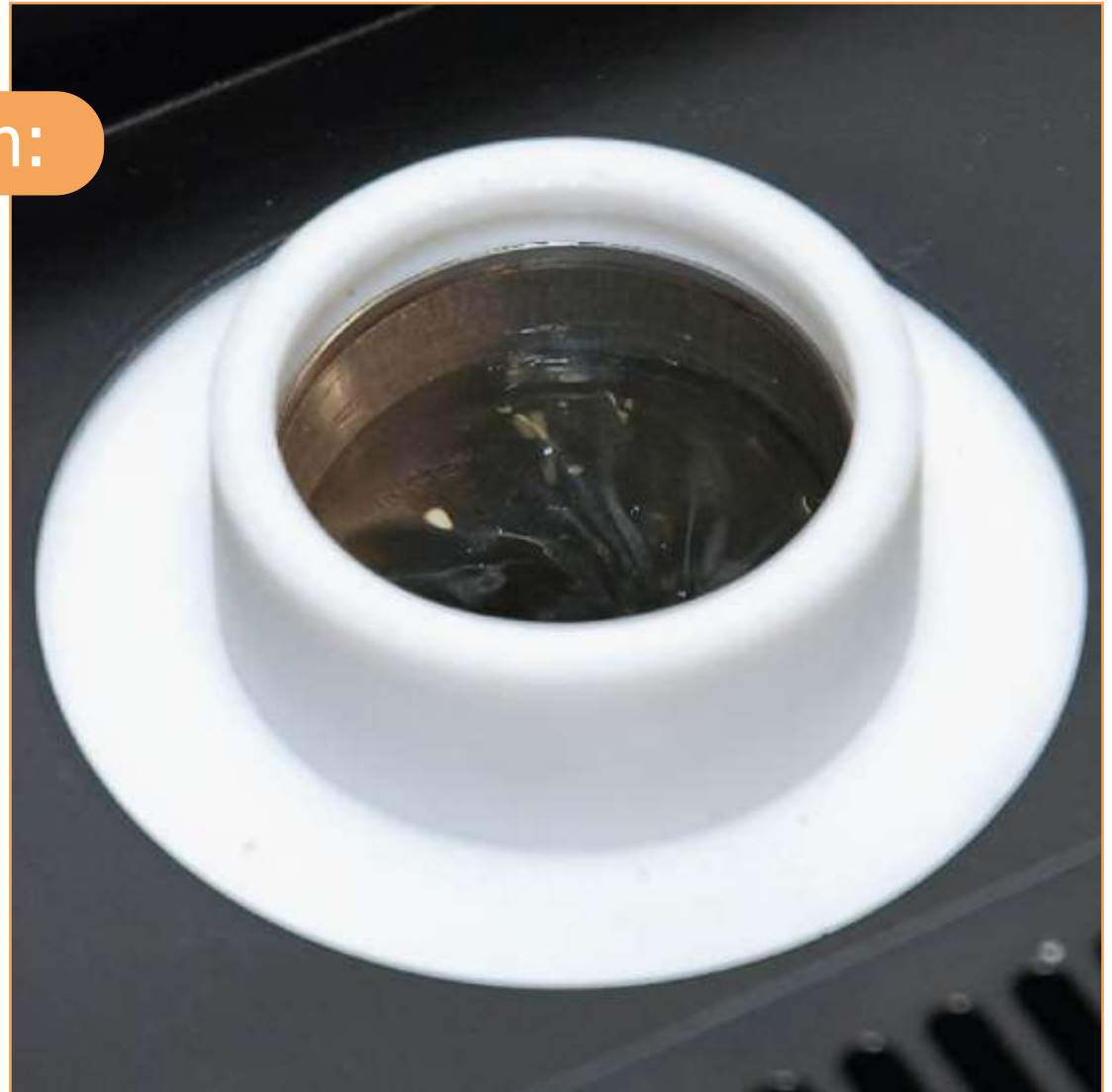
1. Metal Block Bath:

- Fast, Convenient, Mess free operation



2. Stirred liquid bath operation:

- Awkward shaped sensors
- Improved accuracies
- Use with reference probes



3. Stirred ice bath:

- Simple but effective 0°C ice bath
- Check for drift in thermometers



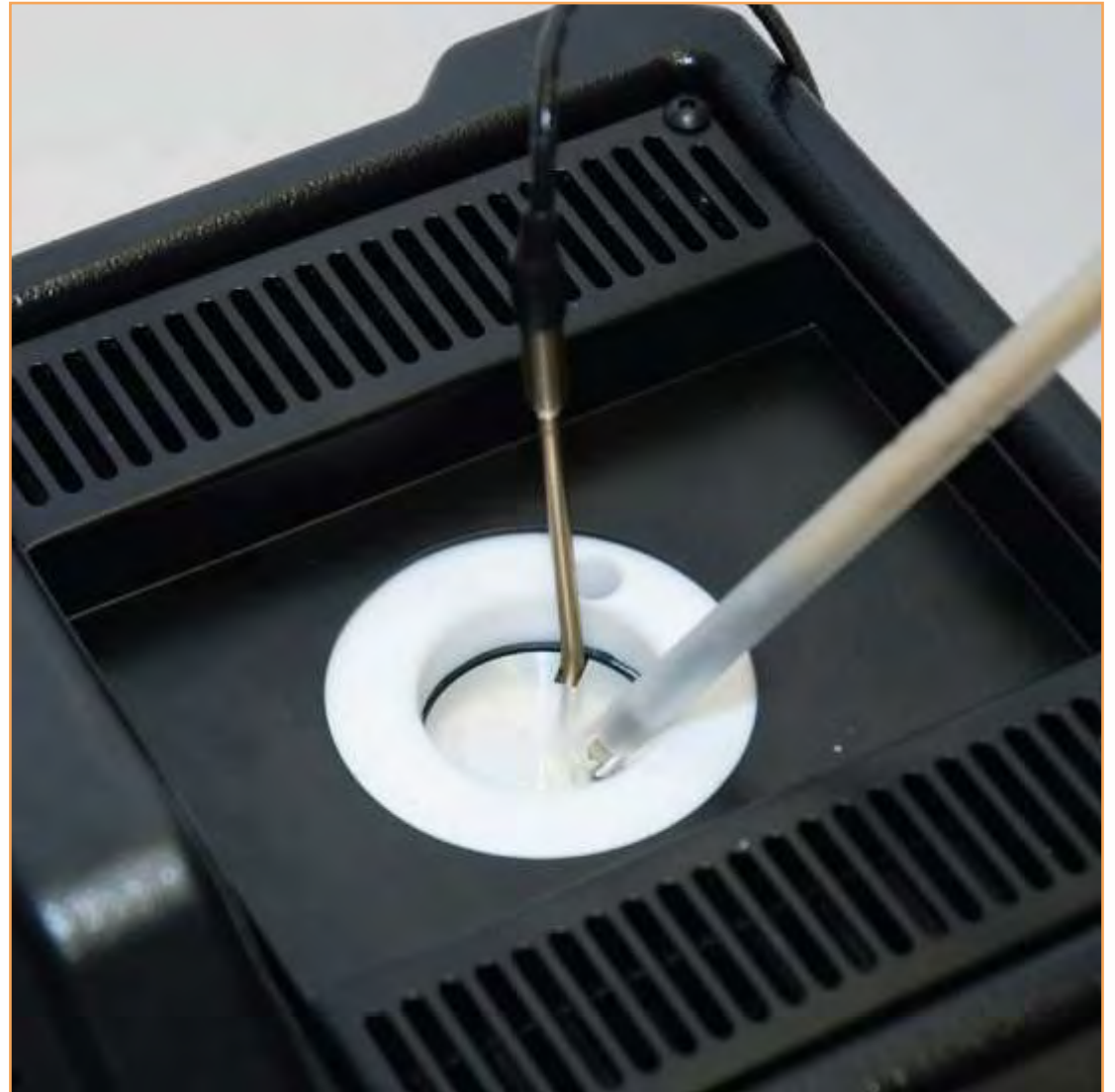
4. Blackbody source:

- Test & Check low cost IR Thermometers



5. Surface sensor kit:

- Save on the cost of additional equipment for surface sensor calibration



6. ITS-90 Fixed Points:

- 17724 Mercury Slim Cell (Europa)
- B8 Water Triple Point Cell (Venus/Europa/Hyperion)
- 17401 Gallium Slim Cell (Venus/Europa/Hyperion)



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Higher Temperatures

Models covering 30°C to 700°C



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Fast-cal



[Click Me](#)

4000 Series



[Click Me](#)

511 Medusa

Higher Temperature Blocks

PROS

- Fast
 - Portable
 - Best Value
 - Multi Purpose
-

CONS

- Minimum Temperature 30°C
- Slow Around Ambient Temperatures



CHOOSING A DRY BLOCK

Higher Temperature:
150°C to 1200°C

Thermocouple Calibration Furnace



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4000 Series

Portable Thermocouple Calibration Furnace

PROS

- High Temperature Thermocouple Calibration
 - Portable
-

CONS

- Minimum Temperature 150°C



CHOOSING A DRY BLOCK

To span wider ranges...
you may need more than one
heat source?

E.g. 0°C to 650°C -
Need two dry blocks.

But is 0°C really needed?

if it is... how about an ice flask
for 0°C and then a 650°C Dry Block.



CHOOSING A DRY BLOCK

Part Three: Advanced, Site or Basic

ADVANCED



SITE



BASIC



CHOOSING A DRY BLOCK

Basic, Site or Advanced

BASIC Models



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Fast-cal



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4000 Series



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Oceanus-6

CHOOSING A DRY BLOCK

Basic, Site or Advanced

BASIC Version

Heat Source with digital display of set and nominal block temperature.

- Field changeable units (°C - °F - K)
- Autotune feature
- Setpoint ramp feature
- PC Serial interface

BASIC



CHOOSING A DRY BLOCK

Basic, Site or Advanced

Using a Basic Calibrator

The Thermometer under test is compared to the dry block controller value.

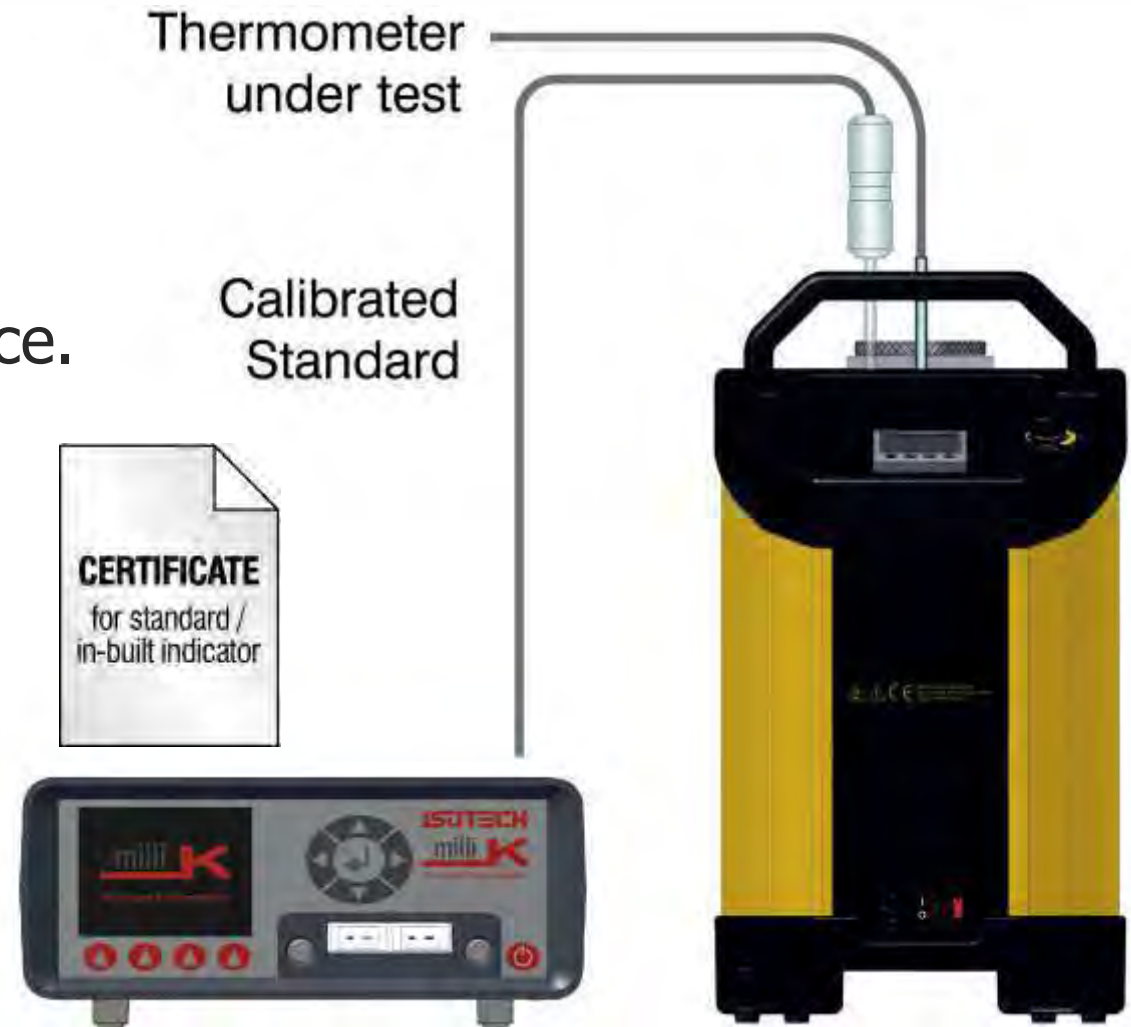
Useful for moderate temperature ranges and quick testing.

Thermometer
under test



Using a Basic Calibrator

Can be used with an external indicator for better performance.



CHOOSING A DRY BLOCK

Basic, Site or Advanced

SITE Models



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Fast-cal



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Oceanus-6

CHOOSING A DRY BLOCK

Basic, Site or Advanced

SITE Version

All the features of the basic version with the addition of an independent indicator to use as the reference channel.

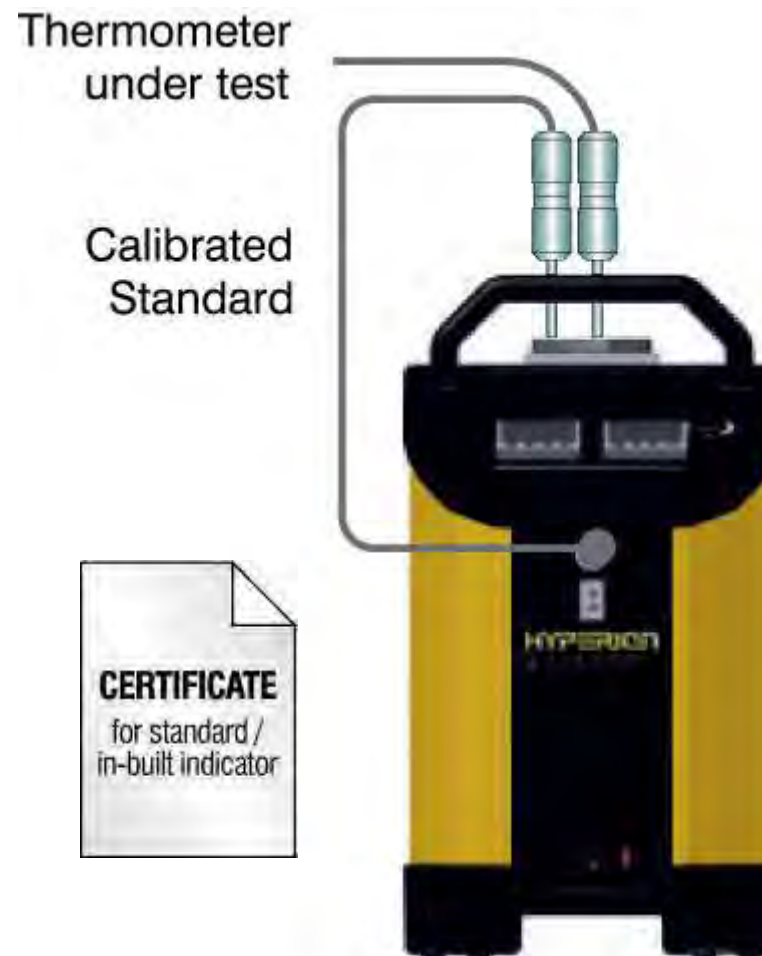
Supports single "Switch" testing with reversible polarity.



CHOOSING A DRY BLOCK

Basic, Site or Advanced

Using the Site (S) Model



CHOOSING A DRY BLOCK

Basic, Site or Advanced

ADVANCED Models



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4000 Series

CHOOSING A DRY BLOCK

Basic, Site or Advanced

ADVANCED Version

Now up to three input channels.

- Datalogging
- Ethernet
- Automatic Temperature Stepping
- Offset Elimination

& Many more features.

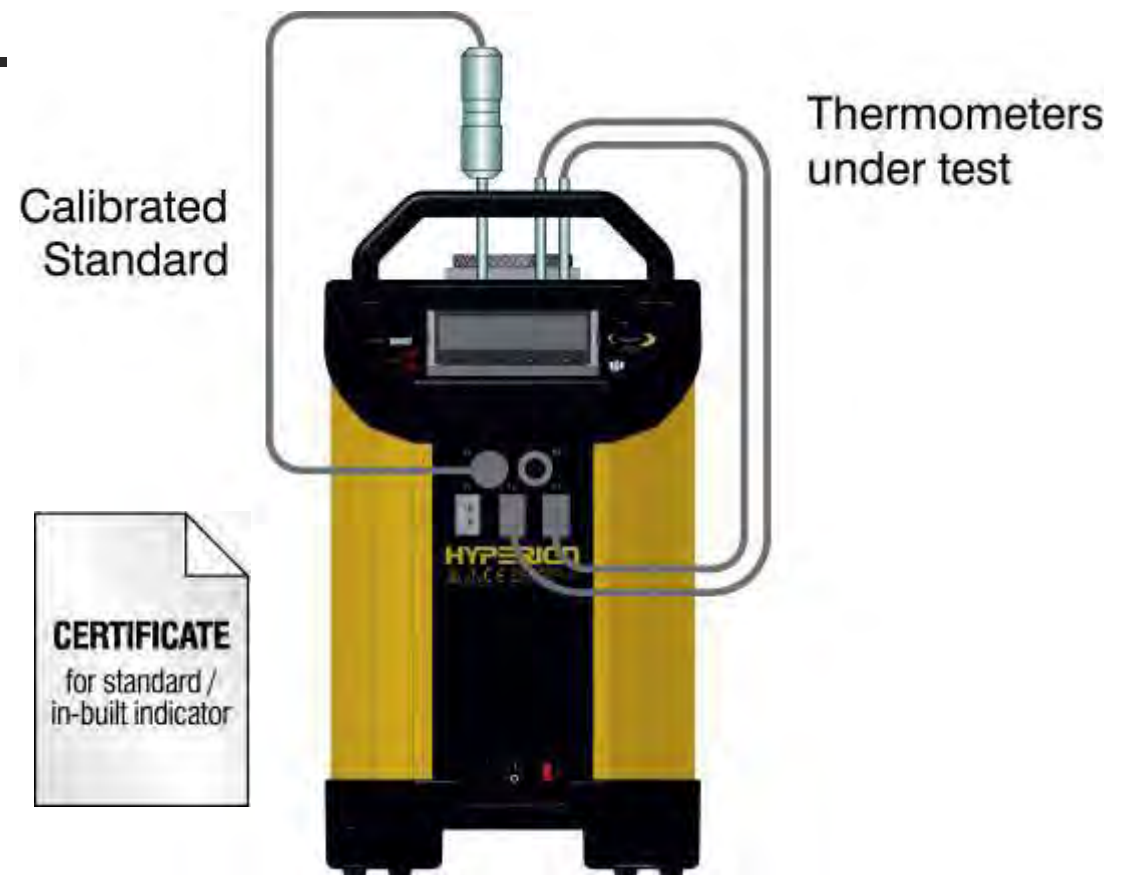


CHOOSING A DRY BLOCK

Basic, Site or Advanced

ADVANCED Version

Has inputs for test thermometers in addition to the reference probe.



CHOOSING A DRY BLOCK

Learn More: Further Information.

Click Me


A Guide to Industrial Temperature Calibration: Traceable Calibration

For best practice, the thermometer (or thermocouple) under test are placed into the calibration volume alongside a calibrated standard. This is so that the test thermometers can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparison. This 'traceability' meets the requirements of quality systems including that of ISO 9000.

Using the Calibrator itself as the Reference (or Standard) makes a number of issues, such as how to temperature reference between the test thermometers and the calibrator display determined. How can the uncertainty value be known?

International Guidelines have been published from EURAMET, "Guidelines on the Calibration of Temperature Block Calibrators" Calibration Guide 1.5. Isotech Calibrators meet the calibration capacity requirements of the guide.

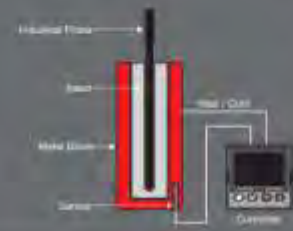
We recommend that a reference probe is used, the same method is used in laboratory temperature laboratories. For less demanding calibration, and the quick testing of sensors, the Calibrators can be used without a reference probe, as in the UKAS Calibration Report for typical performance data.



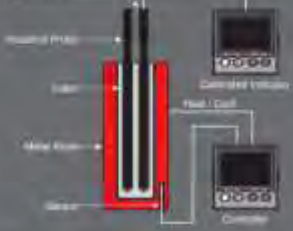
Pre-purchase check list

- Does the supplier have an accredited laboratory?** UKAS accreditation, for reasons of safety, is the public standard for design and competence of multipoint standards (calibrated and declared). Isotech can meet a UKAS Calibrator with the performance depicted in the Tables that also will meet the tolerance in changing pressure distribution that a block will be subjected to during use and compression.
- Experience** Does the product have experience? Do you understand the difference between accuracy and uncertainty? Can they tell you how it can be used for uncertainty (that probably isn't written in the block's literature)?
- Expandable** Can the Dry Block be used with other sensors? Are there accessories available for future expansion? Will there be product updates?
- PC Support** Can it be connected to a computer? What software is available, can it be updated? Is there a Dry Block Calibrator? What is scope of software updates?
- Documented** Is the data fully documented? Can you download a full calibration report from the block? Does it come with a comprehensive facilities brochure? Is there a manual? Does it provide all of those free of charge?
- Practical** Is each Dry Block on your list designed with a simple, clear, easy-to-use interface? Can you see going to buy it? Always take it home to check the size and weight. It is surprising how large some often look, and, when in hand, they feel the same number of pounds. Always if the specification does not include the weight.
- Value** Check the prices, of the given items, of an, what are comparable price when you choose Isotech.


Dry Block Calibrator of Poor Design



Dry Block Calibrator Meeting ISO9000 Requirements



MODEL ADVANCED



- Best performance**
 - Built-in advanced temperature controller that provides best performance
 - Resolution to 0.001 °C - Superior Stability
 - Control parameters automatically optimized with temperature
- View easily in all conditions**
 - Large Bright Colour Display
 - Send to Smartphone
 - Crystal clear display with full colour graphics
- View from anywhere**
 - 21st Century Connectivity with Ethernet and robust webserver
 - Connect to site network and view the calibrator from anywhere, on your Notebook, Tablet or Smartphone
- Save time and money**

AUTOMATIC TEMPERATURE CYCLING

 - Program the ADVANCED with the temperature points you need, store commonly used recipes. The calibrator will then automatically follow these points and log your data.
- Safely store and secure all the data you need**
 - Massive Internal Memory can safely store all your data
 - Store a Millions of data on a USB Drive
 - Choose Open CSV Files or Transfer Print Data with Secure File Format for Data Security
- Supports five languages**
 - English, French, German, Italian and Spanish
 - Simple to use with clear user interface
- Connect more probes**

UP TO 3 INPUT CHANNELS

 - Inbuilt reference system with two universal inputs for PRT, Thermocouple or Process input and a third thermocouple input
 - Input types: Probe inputs including 4-20mA, PRT and Thermocouple Type B, C, D, E, J, K, L, N, R, S, T, U
- Offset elimination**
 - Connect a reference probe to one of the external probe inputs and the calibrator can shift the block temperature to remove offset
 - Block adjusted to reference probe value
 - Remove offset
 - Use in combination with automatic cycling
- Thermostat testing**
 - Test Two Thermocouples Simultaneously
- The software you need**
 - PC tools for reviewing data with support for secure file format, managing temperature programs, easy configuration and data logging

8 | [Calibration solutions](#)

Calibrator Model Advanced | 11

CHOOSING A DRY BLOCK

Learn More: Further Information.

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	 Ø 65mm	 Ø 65mm	 Ø 35mm	 Ø 35mm	 Ø 35mm	 Ø 65mm	 Ø 35mm	 Ø 33.5mm
	Isocal-6					Dry Block Calibrators		
	HYPERION	DRAGO	EUROPA	VENUS	CALISTO	GEMINI	JUPITER	PEGASUS
Specifications								
Metal Block Bath 	✓	✓	✓	✓	✓	✓	✓	✓
Stirred Liquid Bath 	✓	✓	✓	✓	✓			
Stirred Ice/Water Bath 	✓		✓	✓				
Blackbody Source 	✓	✓	✓	✓	✓	✓	✓	✓
Surface Sensor 	✓	✓	✓	✓	✓		✓	
ITS-90 Fixed Point 	✓	✓	✓	✓	✓			
Temperature Range (°C)								
1200°								150°C → 1200°C
1100°								
1000°								
900°								
800°								
700°								
600°								
500°								
400°								
300°								
200°								
100°								
0°								
-100°								
	-25°C → 140°C	30°C → 250°C	-45°C → 140°C	-35°C → 140°C	30°C → 250°C	35°C → 700°C	35°C → 660°C	

Special Applications: **Please Contact Us**

Have probes that
don't fit?

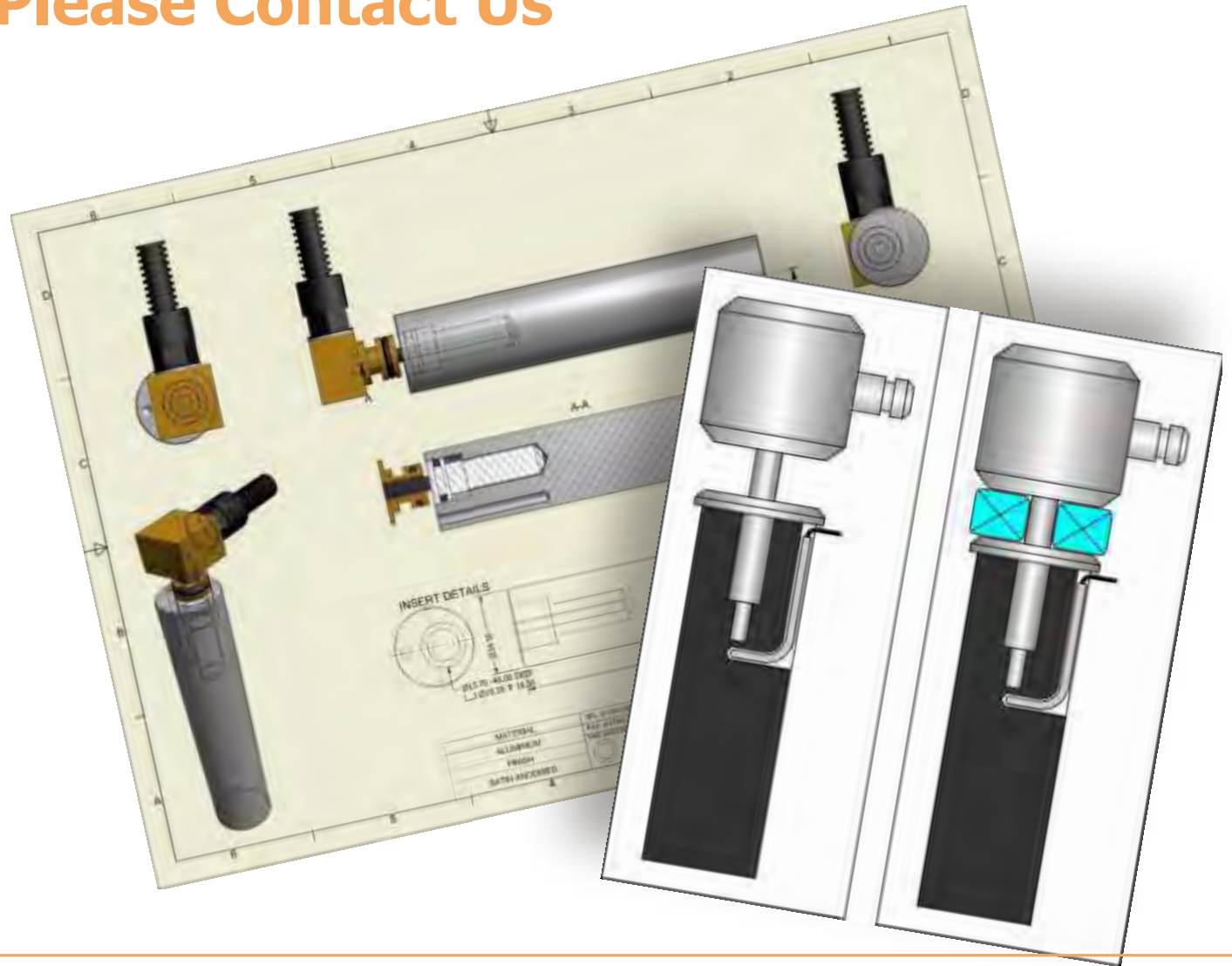
Need Advice?

CONTACT US:

+44(0)1704 543830

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Consultancy Page



Part Four: Calibration Options

All Isotech Dry Blocks include a traceable calibration certificate.

Basic models cover block temperature.

When the Site or Advanced models are ordered with a reference probe this is included on the certificate.

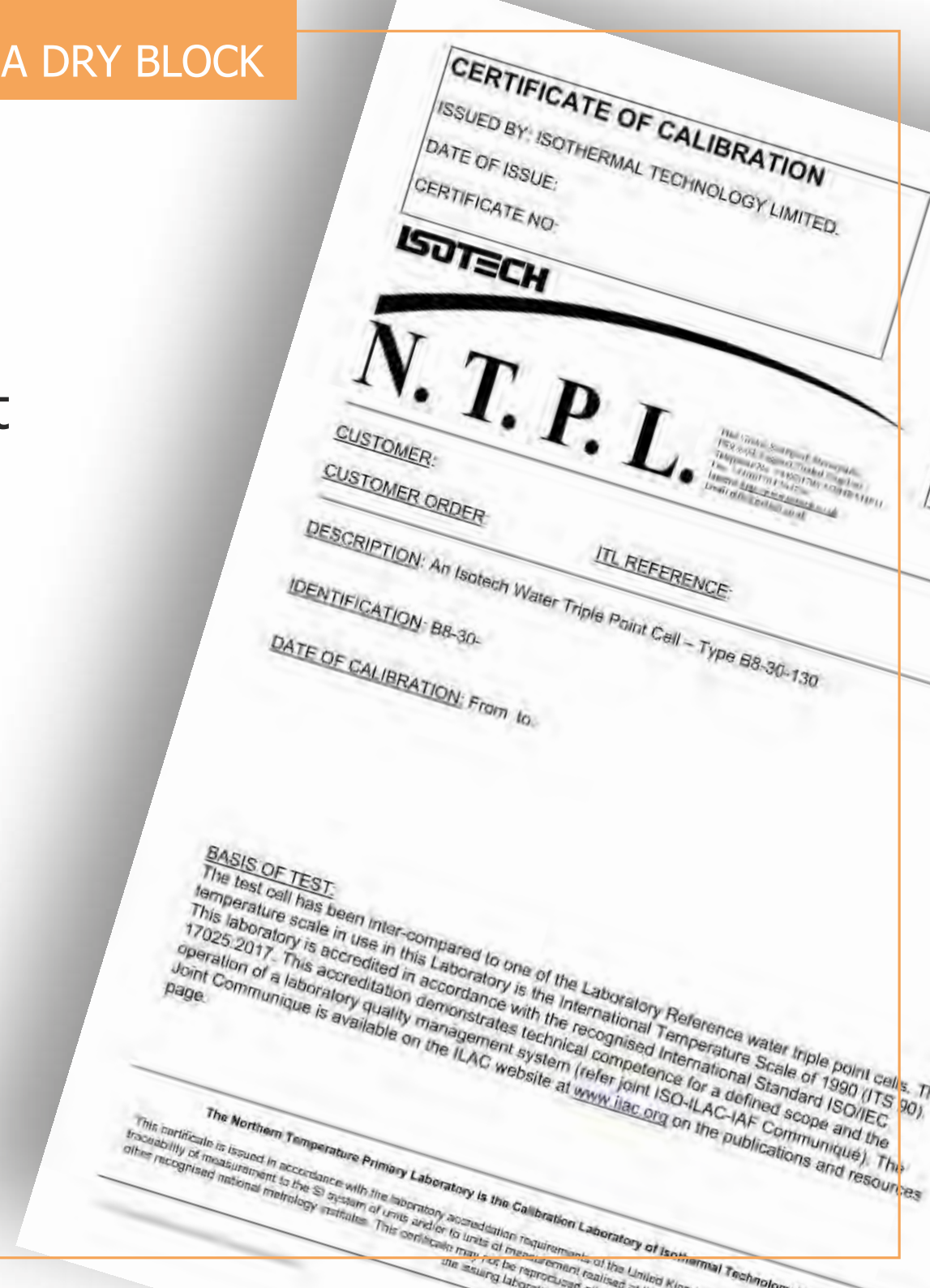


CHOOSING A DRY BLOCK

UKAS (ISO 17025) is available at extra cost.

Our UKAS Certificate carry the ILAC-MRA Logo and recognised in many countries.

Best Practise - Find out more
www.ukas.com



CHOOSING A DRY BLOCK

We offer three services (Additional Cost)

The following calibration options are available		Code
Basic, Site and Advanced	5 point calibration for block temperature; includes reference probe values when ordered with Site or Advanced	UKAS-TEMP
Advanced	5 point calibration for block temperature and reference probe (when ordered) and electrical simulation of indicator	UKAS-SYST
Advanced	Calibration of input channels, electrical simulation only	UKAS-SIM



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