



THE QUEEN'S AWARDS
FOR ENTERPRISE:
INNOVATION
2017

ISOTECH

ISOTHERMAL TECHNOLOGY LTD

Choosing a Dry Block

Part One: Sensor Sizes

Part Two: Temperature Ranges and features

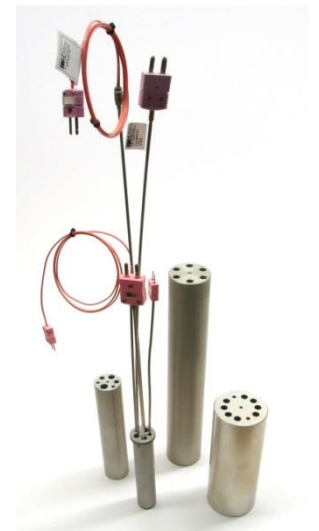
Part Three: Basic, Site or ADVANCED

Part Four: Calibration Options



Choosing a Dry Block

First Question: what size are the thermometers to be calibrated?



Choosing a Dry Block

What size are the thermometers to be calibrated?

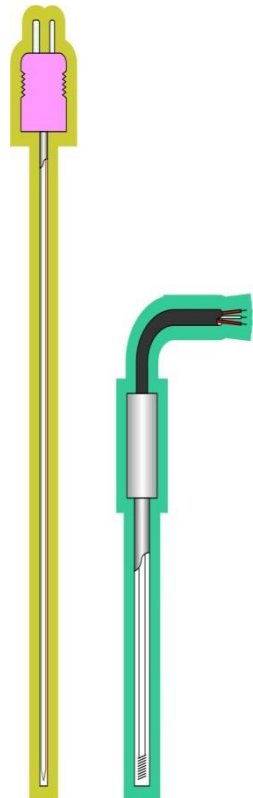
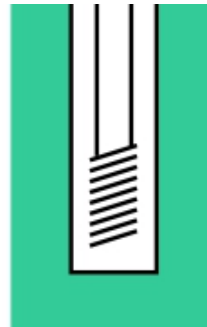
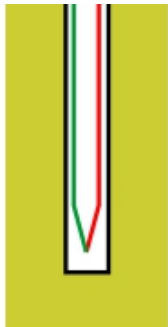
The Dry Block must have a block large enough and deep enough to suit the test thermometers



Choosing a Dry Block

What size are the thermometers to be calibrated?

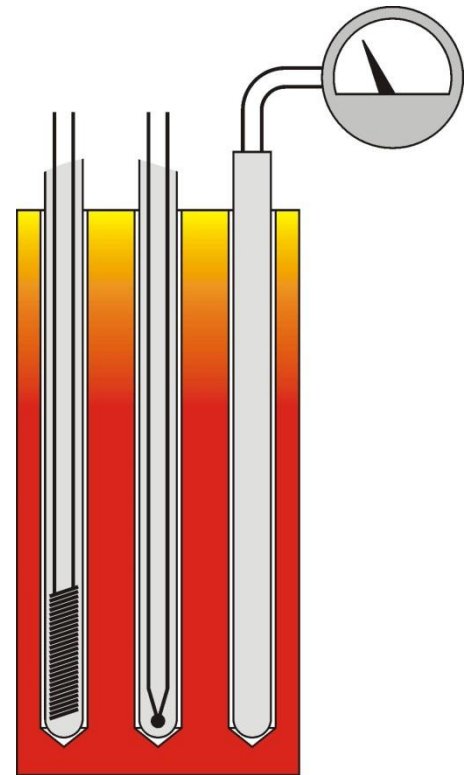
PRT or RTDs and thermocouples are commonly calibrated in blocks 140 to 160mm deep



Choosing a Dry Block

What size are the thermometers to be calibrated?

But other sensors may demand greater depth



Choosing a Dry Block

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



ISOTECH

Choosing a Dry Block: Insert Size

Fast-Cal - 25mm x 148mm

Standard Thermometer Pockets:

2 x 4.5mm, 1 x 6.5mm and 1 x 8mm

Others to special order



<http://isotech.co.uk/fast>

Fast response highly portable operation



ISOTECH

Choosing a Dry Block: Insert Size

Isotech 4000 Range 35 x 160mm

Standard Thermometer Pockets:

2 x 4.5mm, 2 x 6.5mm, 1 x 8mm and
9.5mm

Others Available



<http://www.isotech.co.uk/4000>



35mm Diameter for More Pockets – and more featured Dry Blocks



ISOTECH

Choosing a Dry Block: Insert Size

Isotech 65mm Diameter Blocks

Room for many more thermometers
or bigger thermometers – depth to
160mm



<http://www.isotech.co.uk/4000>

65mm Diameter for even more Pockets – and more featured Dry Blocks



ISOTECH

Choosing a Dry Block: Insert Size

Isotech “Deep” Blocks

Depth to 300mm x 50mm
diameter



<http://www.isotech.co.uk/deep>

Greater Depth

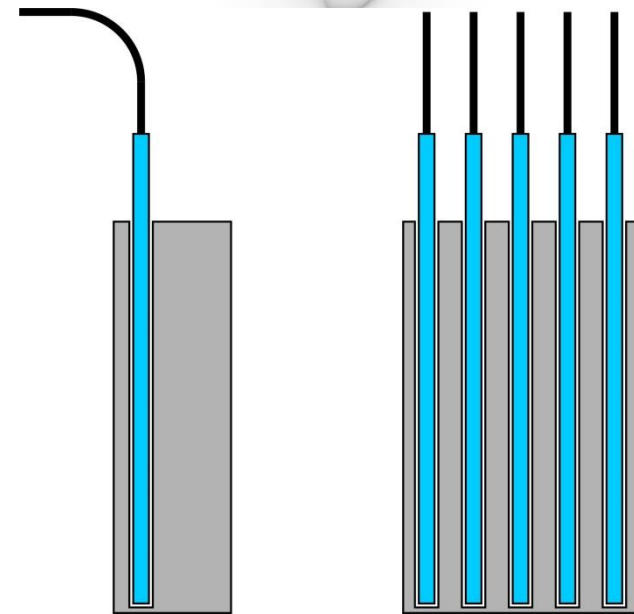


ISOTECH

Response Times

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

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



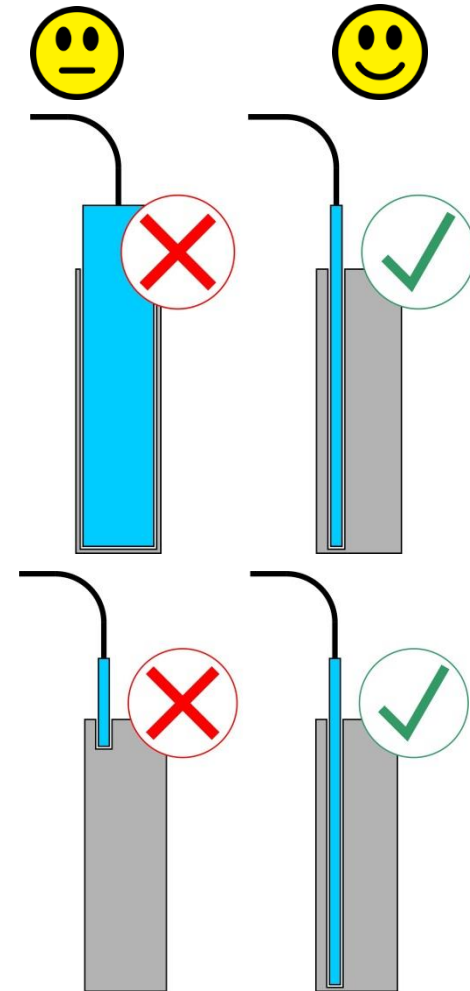
Top Tips

Adequate Thermal Volume

Keep probe or probes small compared to mass of block

Ensure Good Immersion Depth

Ensure sensors are sufficiently immersed

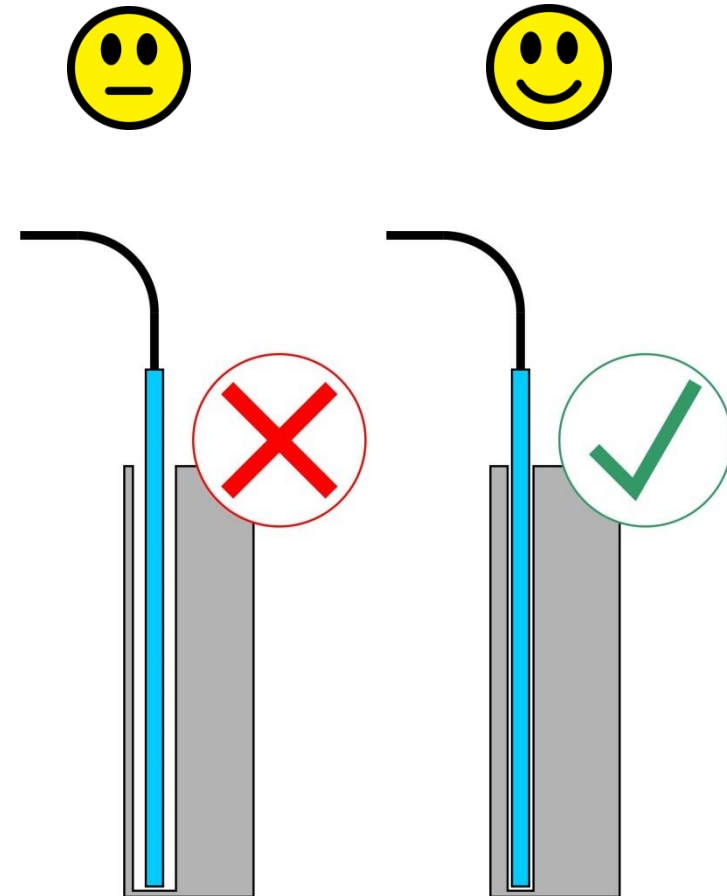


Top Tips

Hole Sizes

Generally make pockets 0.5mm larger than probe size

In Dry Blocks - avoid liquids or other transfer mediums



Learn More: Further Information

More Information About Depth



How Hot is Your Block

Considering depths of immersion and probe sensors in Dry Blocks.

[READ NOW](#)



Industrial Measurements with Very Short Immersion

The challenge of measuring with short immersion; including surface temperatures.

[READ NOW](#)



Temperature Calibration; Depths of Immersion

Of all the sources of errors and uncertainties in thermal calibration by far the largest source of error and least understood effect is that of immersion of unit under test, and the reference standard.

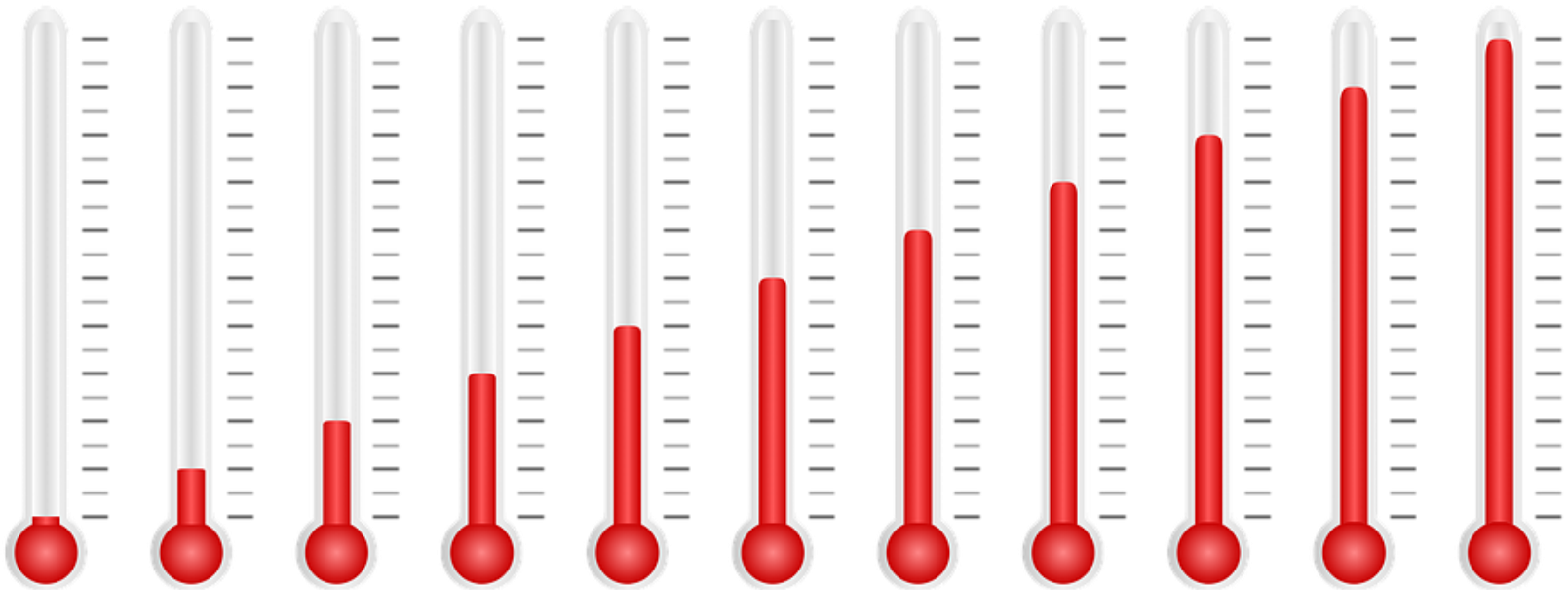
[READ NOW](#)

<http://bit.ly/2j14IWg>



Choosing a Dry Block

Part Two temperature range; and multifunctional calibrators



Choosing a Dry Block

What temperature range needs to be covered?

Dry Blocks can go as low as -100°C and as high as 1200°C

There are four general categories



Choosing a Dry Block

Cryogenic Blocks

Isotech Model 525

-100°C to 40°C

Uses a Free Piston Stirling
Cooler



ISOTECH

Choosing a Dry Block

Isotech Model 525

Pros



Operation to -100°C

Good for on site validation and calibration at low temperatures

Cons



Higher cost and less portable than our other ranges



<http://bit.ly/2kiyKip>



ISOTECH

Choosing a Dry Block

“Peltier Blocks”

Models covering -45°C to 140°



<http://isotech.co.uk/fast>

<http://www.isotech.co.uk/4000>

<http://www.isotech.co.uk/deep>



ISOTECH

Choosing a Dry Block

Peltier Blocks

Pros



Fast

Portable

Good Value

Multi Purpose

Cons



Minimum Temperature -45°C



ISOTECH

Choosing a Dry Block

Isotech Isocal-6 Models



The New Advanced Range
21st Century Connectivity - Inbuilt Webserver
Automatic Temperature Cycling
Connect More Probes, 3 Input Channels
Smartphone Style Color Display

ISOCAL-6
Liquid & Dry Block

World's First Multi-Funtional Baths

Six Functions



Black Body Block Bath ITS-90 Ice Bath Liquid Bath Surface Sensor

The image shows a central yellow and black Isotech Isocal-6 multi-functional bath. It has a digital display on top showing '50.001' and '50.00'. Below the main image are six small inset images demonstrating different functions: Black Body, Block Bath, ITS-90, Ice Bath, Liquid Bath, and Surface Sensor.

<http://www.isotech.co.uk/4000>



ISOTECH

ISOCAL 6 options... What are they?

The ISOCAL-6 models can be used as Dry Blocks but also as

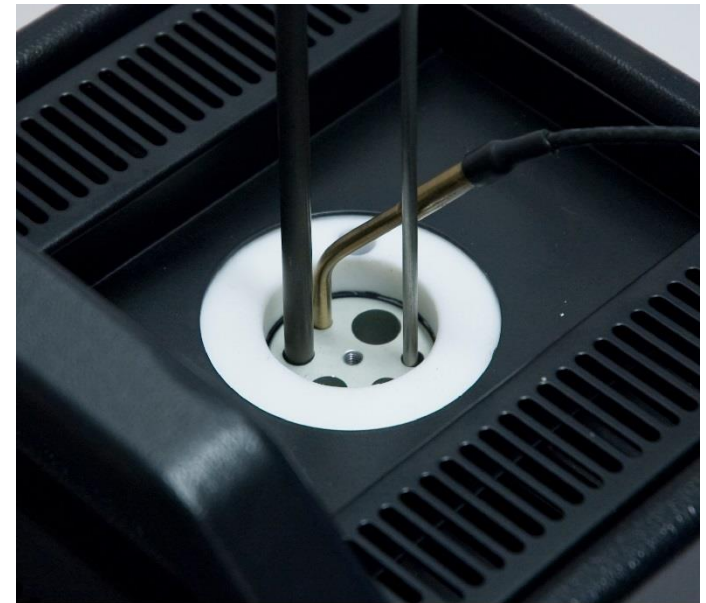
Liquid Baths

A Stirred Ice Bath

Blackbody Sources

Surface Sensor Calibrators

ITS-90 Fixed Points



1: Dry Block Operation

[YouTube Video](#)



ISOTECH

ISOCAL 6 options... What are they?

2. Stirred liquid bath operation

Awkward shaped sensors

Improved accuracies

Use with reference
probe



[YouTube Video](#)



ISOTECH

ISOCAL 6 options... What are they?

3. Stirred Ice bath

Simple, but effective 0°C
ice bath

Check for drift in
thermometers



[YouTube Video](#)

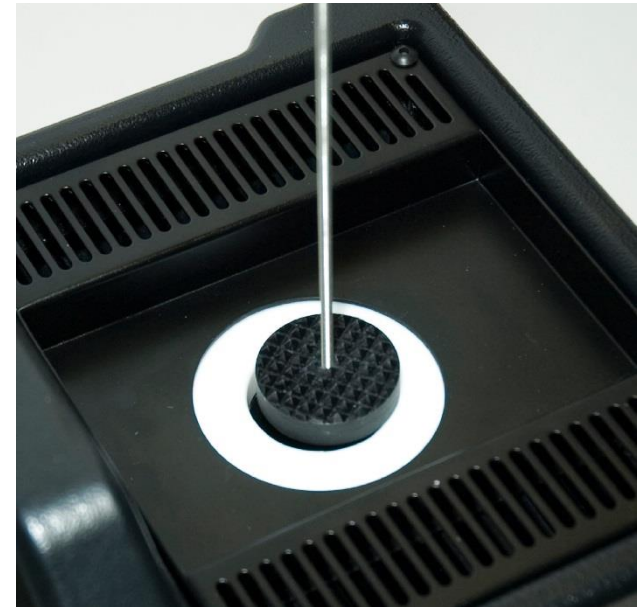


ISOTECH

ISOCAL 6 options... What are they?

4. Blackbody Source

Test and check low cost IR thermometers



[YouTube Video](#)

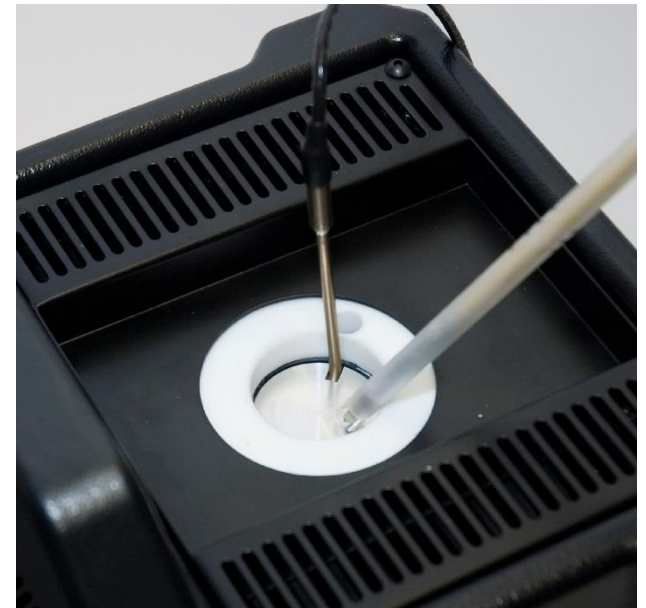


ISOTECH

ISOCAL 6 options... What are they?

5. Surface sensor kit

Save on the cost of additional equipment for surface sensor calibration



[YouTube Video](#)



ISOTECH

ISOCAL 6 options... What are they?

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



[YouTube Video](#)



ISOTECH

Choosing a Dry Block

Higher Temperatures

Models covering 30°C to 700°C



<http://isotech.co.uk/fast>



<http://www.isotech.co.uk/4000>



<http://www.isotech.co.uk/deep>



ISOTECH

Choosing a Dry Block

Higher Temperature Blocks

Pros

Fast

Portable

Best Value

Multi Purpose



Cons

Minimum Temperature 30°C

Slow Around Ambient Temperatures

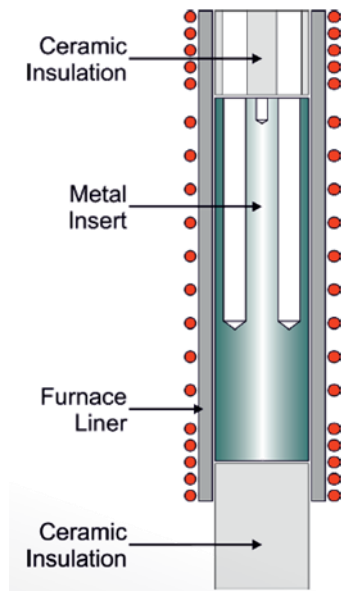


ISOTECH

Choosing a Dry Block

Highest Temperature: 150 to 1200°C

Thermocouple Calibration Furnace



<http://www.isotech.co.uk/4000>



ISOTECH

Choosing a Dry Block

Portable Thermocouple Calibration Furnace

Pros



High Temperature Thermocouple C

Portable

Cons



Minimum temperature 150C



ISOTECH

To Span Wider Ranges...

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



ISOTECH

Choosing a Dry Block

Part Three... ADVANCED, Site or Basic?



Choosing a Dry Block: Basic Models

“BASIC Models”



<http://isotech.co.uk/fast>

<http://www.isotech.co.uk/4000>

<http://www.isotech.co.uk/deep>



ISOTECH

Choosing a Dry Block: Basic Models

BASIC version

Heat source with digital display of set and nominal block temperature

Most Models Have

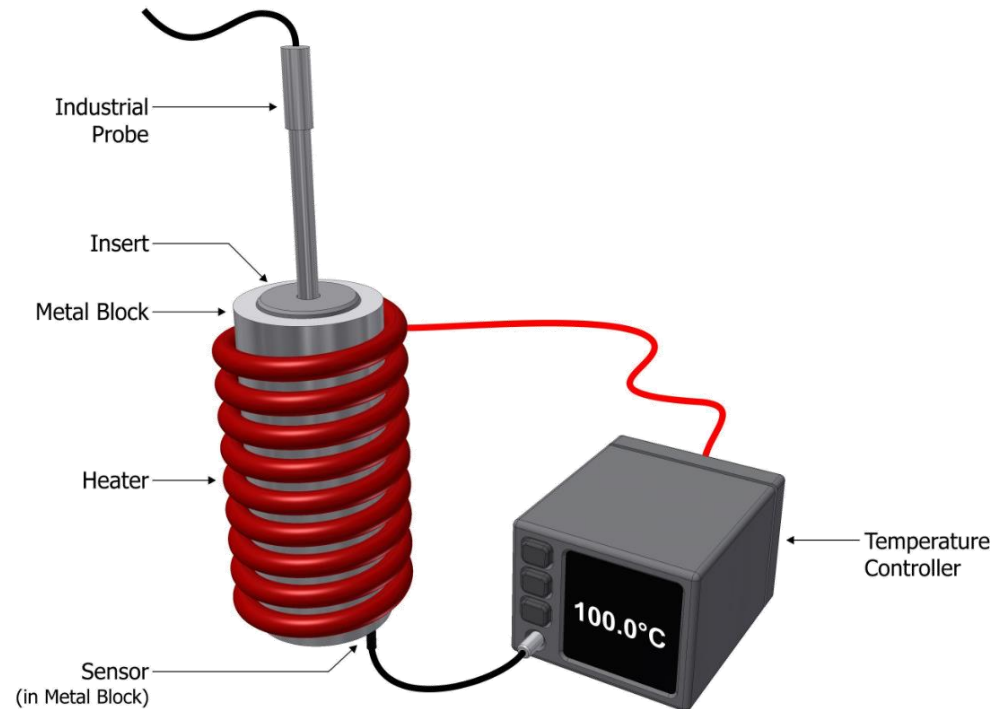
- Field changeable units °C - °F – K
- Autotune feature
- Setpoint ramp feature
- PC Serial interface



Using a Basic Calibrator

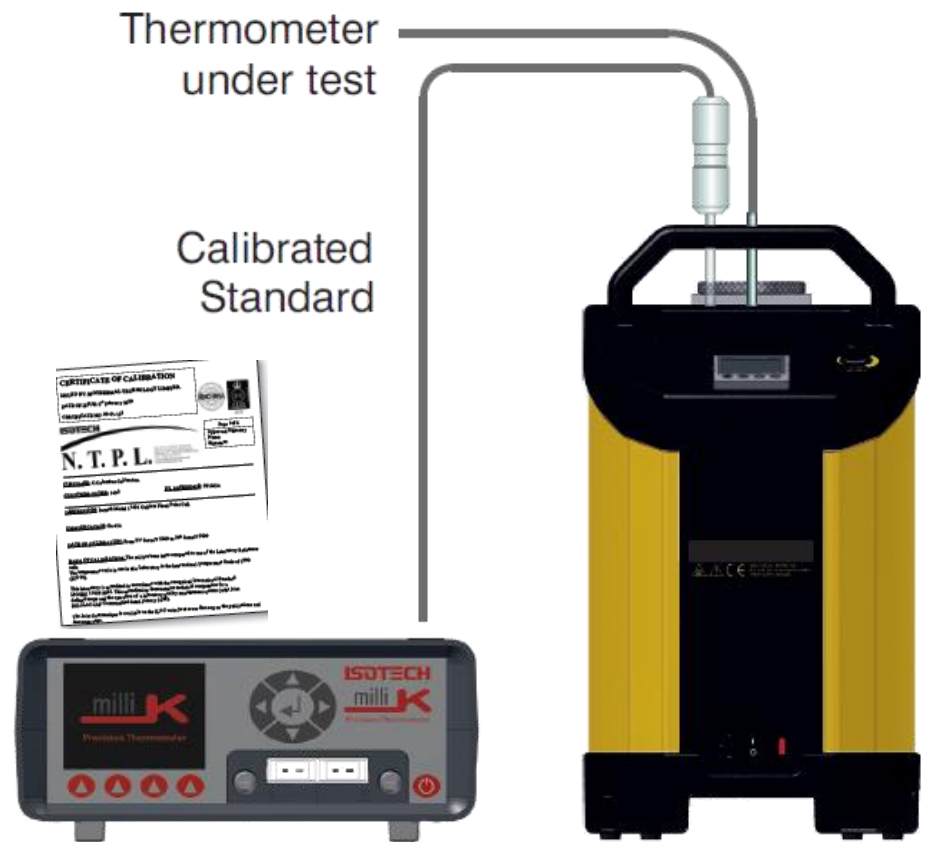
The thermometer under test is compared to the dry block controller value

Useful for moderate temperature ranges and quick testing



Using a Basic Calibrator

Can be used with an external indicator for better performance



ISOTECH

Choosing a Dry Block: Site Models

“Site Models”



<http://isotech.co.uk/fast>



<http://www.isotech.co.uk/4000>



<http://www.isotech.co.uk/deep>



ISOTECH

Choosing a Dry Block: Site Models

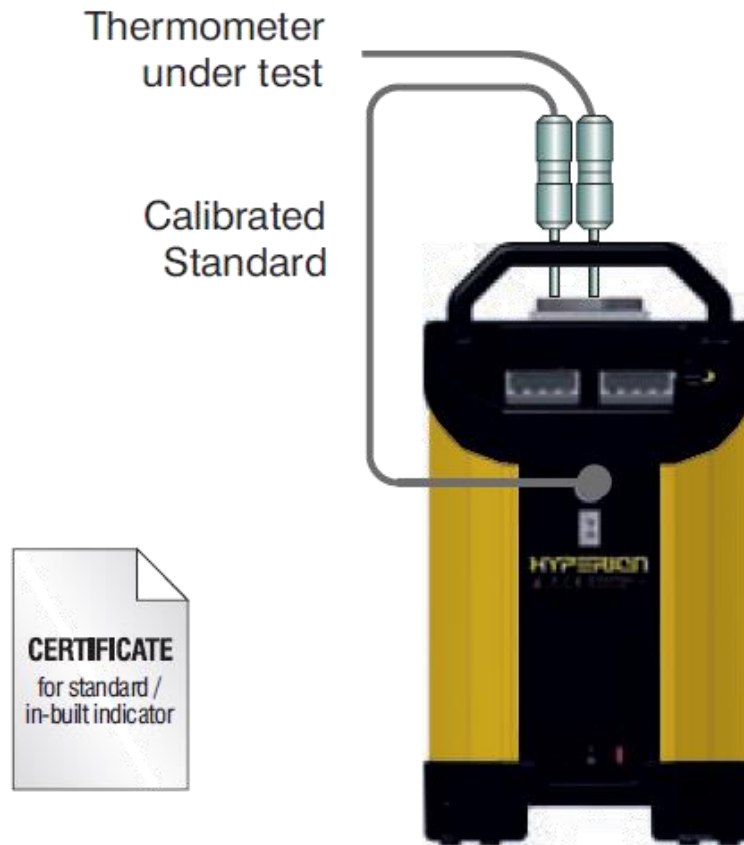
The Site model

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



Using the Site (S) Model



Choosing a Dry Block: ADVANCED Models

“ADVANCED Models”



<http://www.isotech.co.uk/4000>



ISOTECH

Choosing a Dry Block: ADVANCED Models

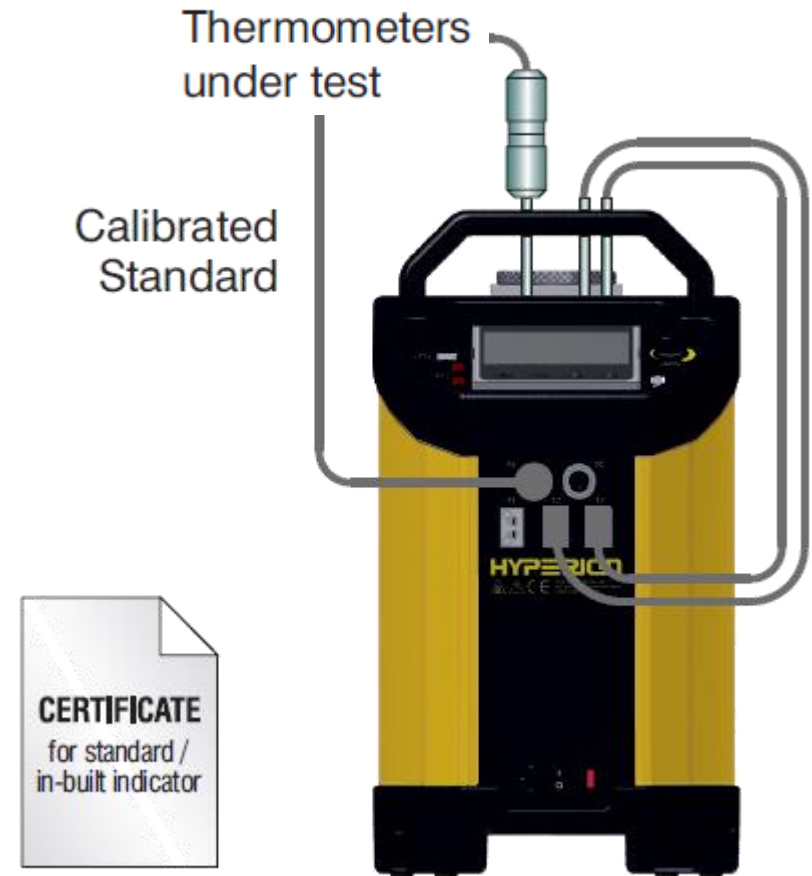
ADVANCED version

- Now up to three input channels
 - Datalogging, Ethernet, Automatic temperature stepping, Offset Elimination and many more features



Using the ADVANCED Model

Isotech ADVANCED –
has inputs for test
thermometers in
addition to the
reference probe



Learn More: Further Information

ISOTECH

A Guide to Industrial Temperature Calibration: Traceable Calibration

For more detailed information, visit our website at www.isotech.com or contact our sales team at 01787 815100.

Pre-purchase checklist

1. **Do I have the necessary metrological infrastructure?** Traceable calibration requires a high level of accuracy and stability of the reference standards used. It also requires a high level of stability and accuracy of the measuring equipment used.
2. **Is my equipment suitable for the application?** Consider the range of temperatures and media (gas, liquid, solid) that your equipment can measure.
3. **Do I have the necessary traceability?** Ensure that your calibration is traceable to the appropriate national or international standards.
4. **Do I have the necessary accreditation?** Consider the requirements for ISO 9000 accreditation for your calibration service.
5. **Do I have the necessary resources?** Consider the staff, facilities and equipment needed for a successful calibration service.
6. **Do I have the necessary documentation?** Ensure that you have the necessary records and certificates to provide a complete calibration service.
7. **Do I have the necessary budget?** Consider the cost of the calibration service and the investment in the necessary equipment.



Dry Block Calibrator of Poor Design



Dry Block Calibrator Meeting ISO9000 Requirements

ISOTECH

MODEL ADVANCED



- Best performance**
 - Built from industrial materials
 - Accurate to 0.01°C Superior stability
 - Guaranteed automatic calibration
- View easily in all conditions**
 - Large Bright Colour Display
 - Works in bright light with full colour protection
- View from anywhere**
 - 21" Colour Touchscreen with 800x480 resolution
 - Connect to a network and view the calibration from anywhere on your network. (able in development)
- Save time and money**

AUTOMATIC TEMPERATURE CYCLING

 - Program the automated cycle to save time and money.
 - The software will automatically adjust the cycle time to suit your needs.
- Safely store and secure all the data you need**
 - Massive internal memory can safely store all your data
 - Save a backup of data on a USB Drive
 - Secure Data Copy Mode on Thumb Drive with Secure File Protocol for Data Security
- Supports five languages**
 - English, French, German, Italian and Spanish
 - Simple to use with colour code interface
- Connect more probes**

UP TO 5 INPUT CHANNELS















 - Single channel system with two channel probe for WTC Thermocouple or Pt1000 input & two channel input
 - Input types provided include K, J, E, R, S, B, C, D, G, H, I, L, M, N, P, Q, R, T, U
- Offset elimination**
 - Control & eliminate probe to work to the correct programme and it will auto adjust the probe temperature to correct offset
 - Block selected to reference probe value
 - Manual offset
 - Used in combination with automatic cycling
- Thermostat testing**
 - Test Your Thermostat Simultaneously
- The software you need**
 - PC host for software with support for all major operating systems
 - Windows, Mac, Linux, and other logging

Customer support | 11

<http://bit.ly/2k8bGAI>

Learn More: Further Information

<http://bit.ly/2k8bGAI>

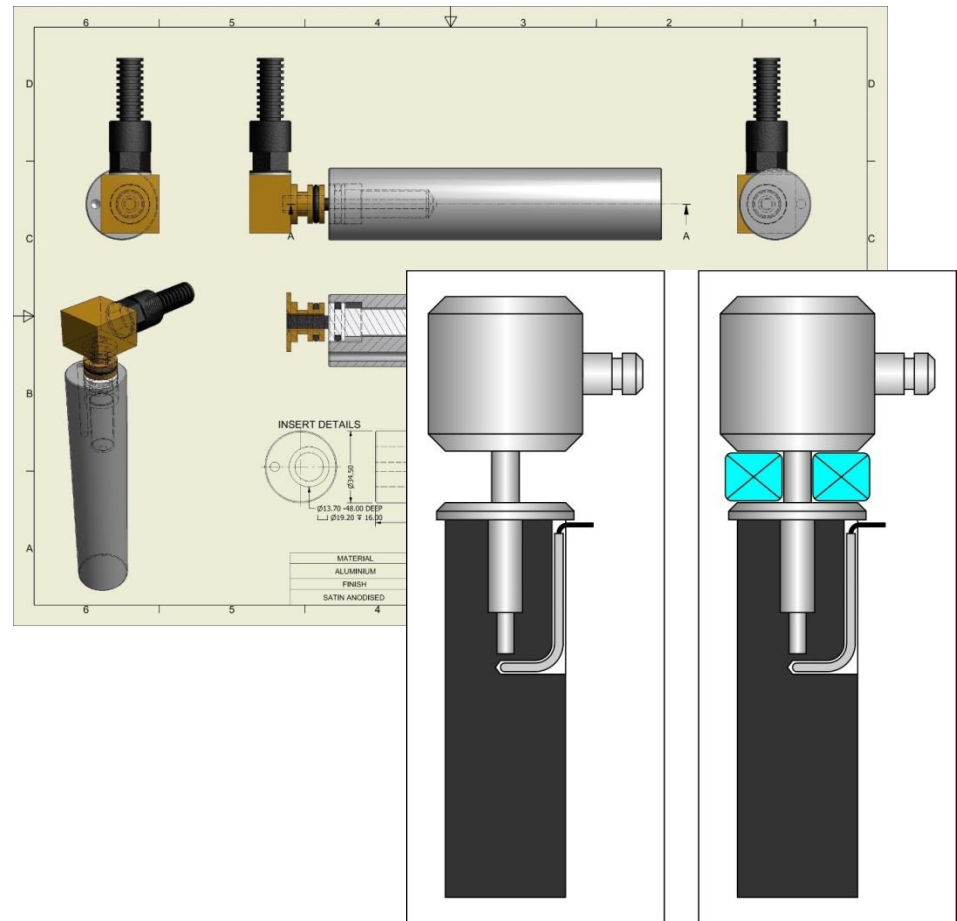
	 Ø 65mm	 Ø 65mm	 Ø 35mm	 Ø 35mm	 Ø 35mm	 Ø 65mm	 Ø 35mm	 Ø 33.5mm
	Isocal-6					Dry Block Calibrators		
	HYPERION	DRAGO	EUROPA	VENUS	CALISTO	GEMINI	JUPITER	PEGASUS
Specifications								
Metal Block Bath 	✓	✓	✓	✓	✓	✓	✓	✓
Stirred Liquid Bath 	✓	✓	✓	✓	✓			
Stirred Ice/Water Bath 	✓		✓	✓				
Blackbody Source 	✓	✓	✓	✓	✓	✓	✓	✓
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



Choosing a Dry Block

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



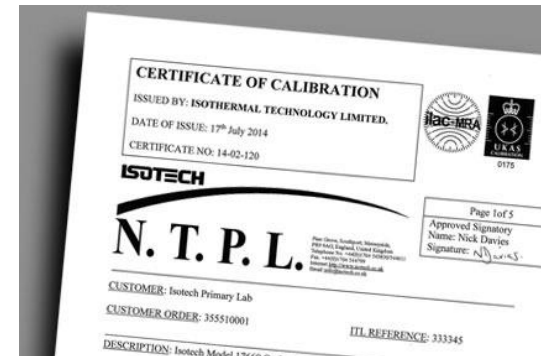
Choosing a Dry Block: Calibration Options

UKAS (ISO 17025) is available at extra cost

Our UKAS Certificates carry the ILAC-MRA logo and recognised in many countries

Best Practise – find out more

www.ukas.com



ISO TECH

Choosing a Dry Block: Calibration Options

We offer three service (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

