GUIDE

Gemini-4857

Isotech

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A Guide to Industrial Temperature Calibration: **Traceable Calibration**

For best practice, the thermometer (or thermometers) 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 comparisons". This "traceability" meets the requirements of quality systems including that of ISO 9000.

Using the Calibrator itself as the Reference (or standard) raises a number of issues, such as how is temperature difference between the test thermometer and the calibrator display determined - how can this 'uncertainty value' be known?

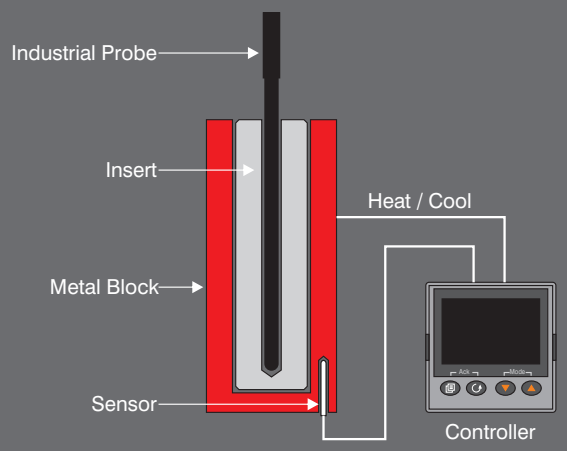
International Guidelines have been published from EURAMET, "Guidelines on the Calibration of Temperature Block Calibrators" Calibration Guide 13. Isotech Calibrators meet the calibration capacity requirements of this guide.

We recommend that a reference probe is used, the same method as used in secondary temperature laboratories. For less demanding calibration, and the quick testing of sensors, the Calibrator can be used without a reference probe, refer to the units Evaluation Report for typical performance data.

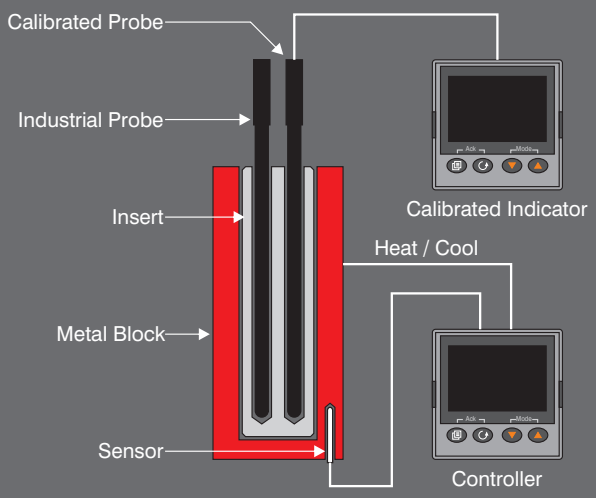
Pre-purchase check list

1. **Does the supplier have an accredited laboratory?**
   UKAS accreditation, "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 when you choose **Isotech.***

Dry Block Calibrator of Poor Design



Dry Block Calibrator Meeting ISO9000 Requirements



Alternative methods of using **Isotech Portable Calibrators**

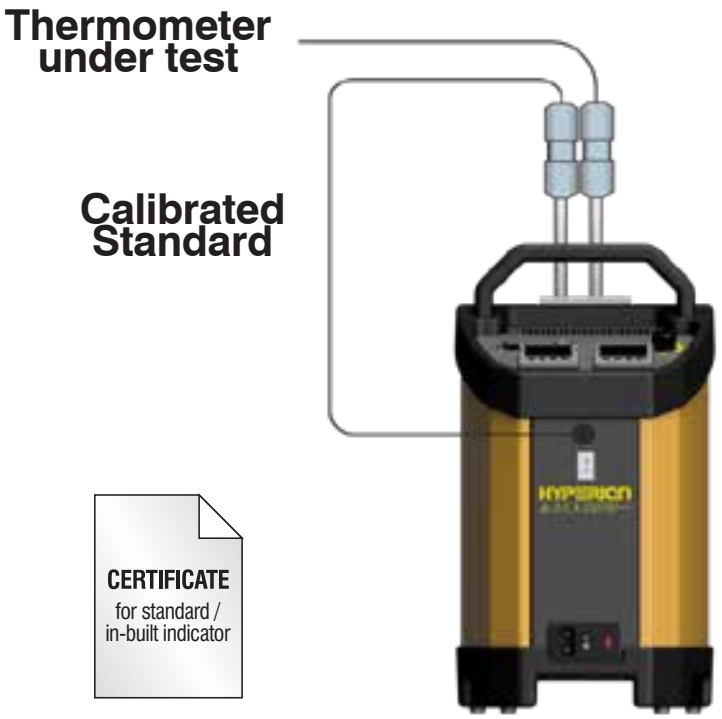
A Basic Dry Block Calibrator

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

A control system with digital display shows the set and measured value from the calibration volume.

An ISO 9000 Calibration System

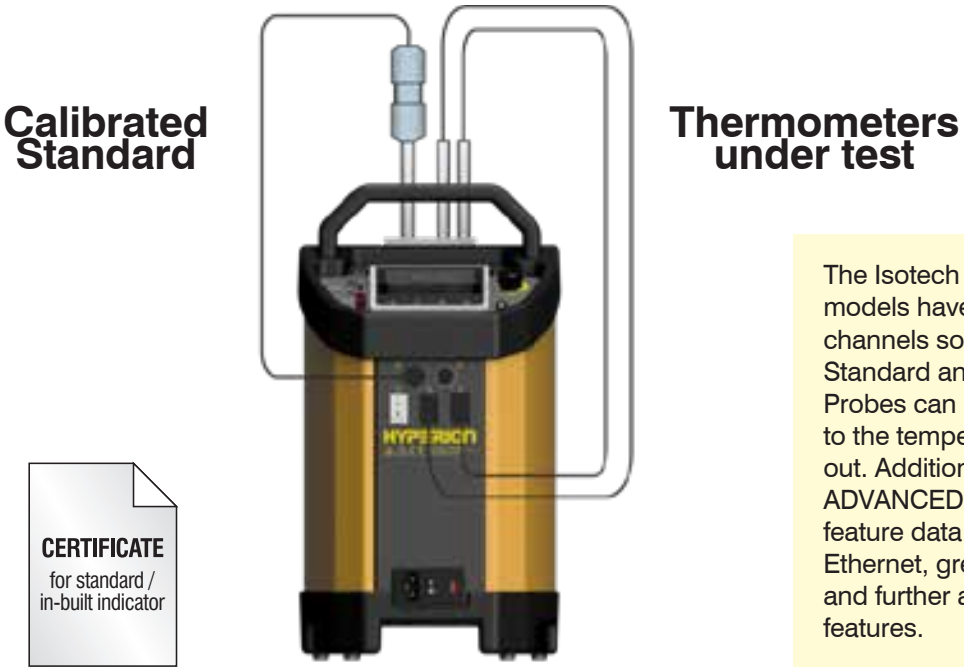
A thermometer under test is compared to a calibrated standard, for true traceability and clearly meets the requirements of ISO9000



In addition to the temperature control system with its display the Isotech SITE model includes a separate temperature read out for the Standard (Reference) probe.

Isotech ADVANCED Calibrator

Isotech ADVANCED models have inputs for both the test thermometer and a calibrated standard.



The Isotech ADVANCED models have three input channels so that both the Standard and the Test Probes can be connected to the temperature read out. Additionally the ADVANCED models feature data logging, Ethernet, greater accuracy and further additional features.

Using an External Indicator

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

An example of Multiple Sensor Calibration

You can add a scanner for multi-probe calibration - the system can then be automated.

System Connections

Isotech - award winning flexible solutions for all sensor types from -45°C to 1200°C

By adding different accessories the 4000 Series can be used in up to six different modes - Dry Blocks, Liquid Baths, Ice Bath, Surface Sensor Calibrator, IR Thermometer Calibrator and even with ITS-90 Fixed Point

	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°						35°C → 700°C		
500°							35°C → 660°C	
400°								
300°								
200°								
100°		30°C → 250°C			30°C → 250°C			
0°	-25°C → 140°C		-45°C → 140°C	-35°C → 140°C				
-100°								