

ISOTECH

Professional Thermocouple Calibration Furnace



547



Isotech has used its **40+ years of experience** and the very latest technology to develop a new deep immersion dry block calibrator, designed to give the user the most accurate calibration results.

Why is Deep Immersion Important?

“ 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. ”

from Temperature Calibration; Depths of Immersion, John P. Tavener

“ A thermometer is sufficiently immersed when there is no change in indicated temperature with additional immersion in a constant temperature environment. ”

from Supplementary Information to the International Temperature Scale of 1990

“ The general problem occurs because there is a continuous flow of heat along the stem of a thermometer between the medium of interest and the outside world. Since heat can only flow where there is a temperature difference, the flow of heat is evidence that the tip of the thermometer is at a slightly different temperature than the medium of interest. ”

from Traceable Temperatures., J.V. Nichols & D.R. White

Why you should choose the 547

Safely support thermocouples



Easy touchscreen operation with an intuitive interface available in six languages: English, French, Italian, German, Spanish & Chinese



Calibrate alumina laboratory standard & industrial thermocouples



Calibrate infrared thermometers with options for blackbody & blackbody fixed point cells



Rapid cooling utilizing dynamic heat flow technology



Can be used open ended to pass through Multi-zone thermocouples

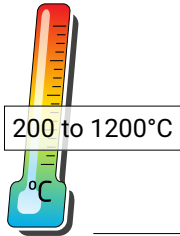


Uniform profile from advanced three zone control



Expand for automated calibration





Deep Immersion Furnace 547

- High Accuracy Thermocouple Calibration
- Calibrates both Laboratory & Industrial Thermocouples
- Options for Blackbody Calibration

The Model 547 is the professional solution for accurate and contamination-free temperature calibration, designed to meet the needs of professionals in a wide range of industries, from industrial to laboratory.

The furnace can be equipped with a blackbody target, making it ideal for calibrating infrared thermometers. For even higher accuracy, it also offers the option to use blackbody cells, ensuring ultimate precision and lowest calibration uncertainties.

The Model 547 is also designed to accommodate open-ended multi-zone thermocouples, making it an ideal choice for calibration professionals in the semiconductor industry.

With a focus on safety and convenience, the Model 547 has been **“designed by metrologists for metrologists”**.

When used in combination with our companion products for checking thermocouple homogeneity, laboratory standard thermocouples, cold/reference junction equipment, and software to automate thermocouple calibration, it is a complete solution for all your temperature calibration needs, that no other company can rival.

Invest in the Model 547 Thermocouple Calibration Furnace and experience the ultimate in temperature calibration accuracy and convenience.



■ Wide Temperature Range

Operates efficiently from 200°C to 1200°C with exceptional stability and uniformity.

■ Versatile Calibration Options

Suitable for various thermocouple types, including laboratory standards and industrial sensors, with support for infrared thermometer calibration using blackbody targets.

■ Advanced Calibration Corrections

Switchable correction curves for deep and short immersion calibrations. Customize up to 16 correction points per immersion type, ensuring precise calibration across the full range. This feature improves accuracy and flexibility for all calibration requirements.

■ Rapid Heating and Cooling

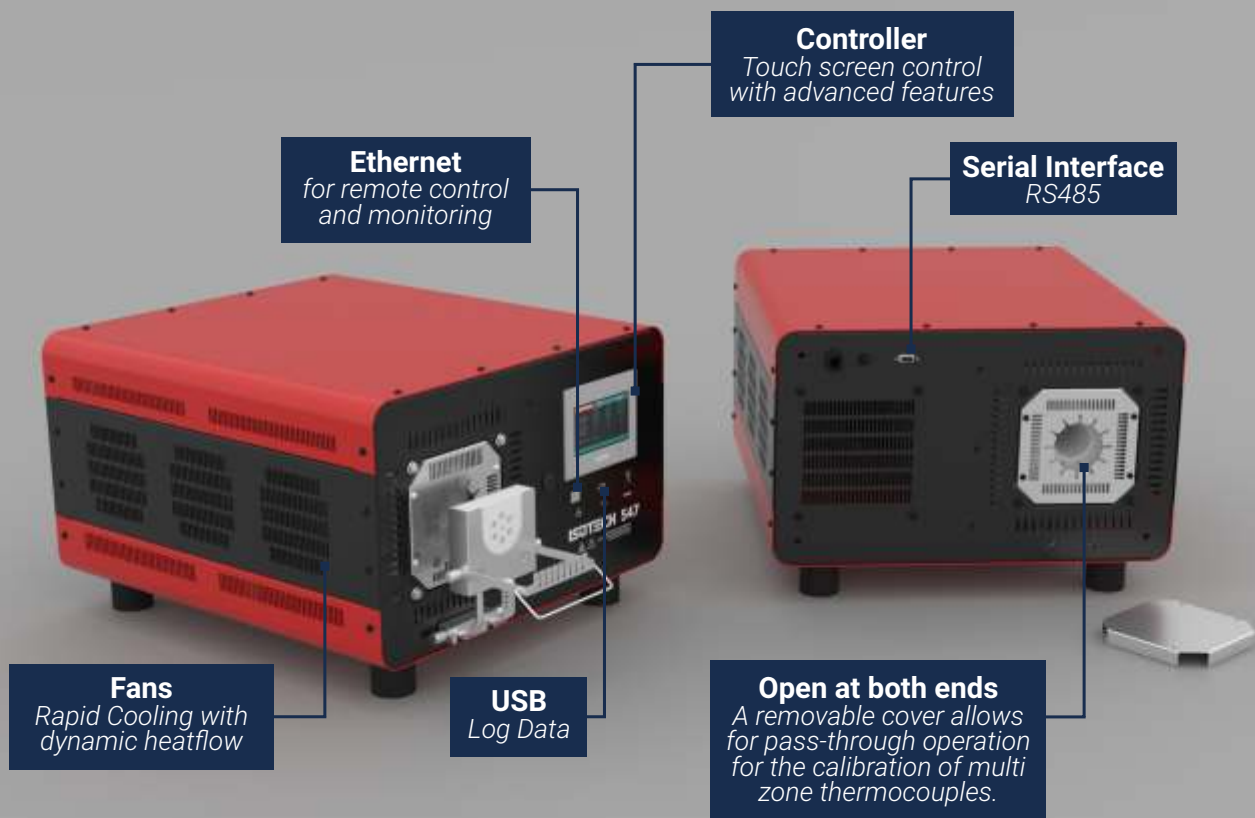
Heats from 50°C to 1200°C in just 45 minutes and cools from 1200°C to 300°C in 90 minutes.

■ Automated Calibration Capability

Expandable for automated processes with software integration, allowing for efficient and precise calibration management.

■ User-Friendly Interface

Features a 4.5" touchscreen display for easy control and advanced three-zone temperature regulation.



Model	547
Temp Range	200°C to 1200°C
Stability	<0.08°C over the entire range
Uniformity	@200°C ±0.2°C @1200°C ±0.3°C (for more information refer to the website)
Display	4.5" Touchscreen
Display Resolution	0.01°
Heating Time	50°C to 1200°C in 45 minutes
Cooling Time	1200°C to 300°C in 90 minutes
Calibration Volume	46mm diameter x 450mm deep
Minimum Immersion	180mm
Interface	Ethernet, Serial (RS485), USB Host
Power	3kW
Dimensions	W510mm x H325mm x L660mm
Weight	55kg

Accessories

Metallic Inserts

Metallic Insert	547-07A	547-07B	547-07C	547-07D
Insert Diameter	45mm	45mm	45mm	Custom Insert Please Specify
Insert Length	130mm	260mm	260mm	
Insert Type	Sensor Pockets	Sensor Pockets	Through Holes	
Holes	6 x 8mm holes	6 x 8mm holes	6 x 8mm holes	

Insert Type: Standard or custom drilled insert with blind holes for calibrating sensors

Insert Type: Open ended insert allows pass through of multi-zone thermocouples

Ceramic Inserts

Ceramic Insert	547-07E	547-07F	547-07G	547-07H
Insert Diameter	45mm	45mm	45mm	Custom Insert Please Specify
Insert Length	130mm	260mm	260mm	
Insert Type	Sensor Pockets	Sensor Pockets	Through Holes	
Holes	6 x 8mm holes	6 x 8mm holes	6 x 8mm holes	

Insert Type: Standard or custom drilled insert with blind holes for calibrating sensors

Insert Type: Open ended insert allows pass through of multi-zone thermocouples

Blackbody Target

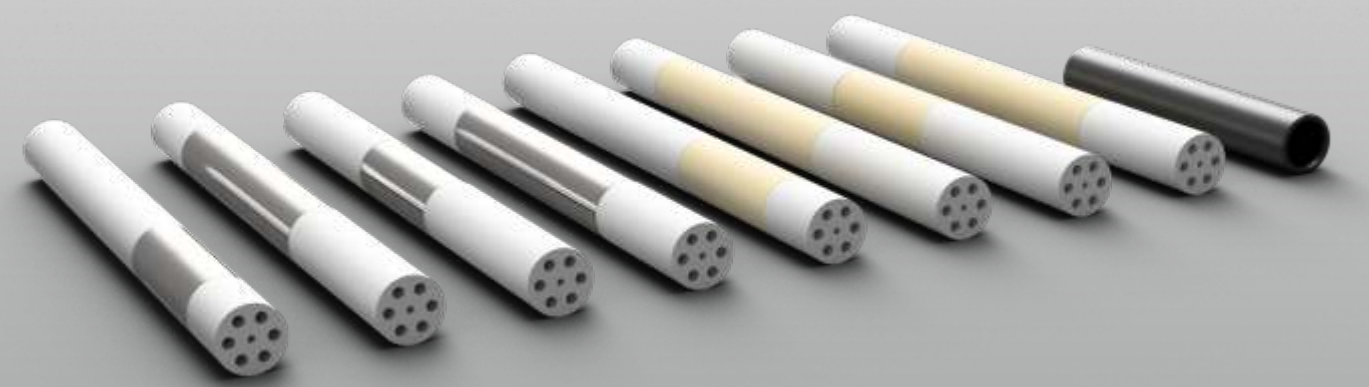
Blackbody Target	547-07I
Target Diameter	45mm
Target Length	273mm
Aperture	Standard

High emissivity source to calibrate infrared thermometers

Blackbody Cells

Blackbody Cell	547-07J	547-07K	547-07L
Cell Type	Zinc	Aluminium	Silver
Temperature	419.527°C	660.323°C	961.78°C
Aperture	10mm	10mm	10mm

High emissivity source to calibrate infrared thermometers



Choice of Alumina or Metallic Inserts

- **Alumina:** metal free inserts-avoid contaminating laboratory standard thermocouples.
- **Metal:** high temperature alloy inserts for high capacity industrial sensor calibration.

Inserts with Sensor Pockets or Through Holes

- **Drilled with Sensor Pockets:** for calibrating Laboratory Standard and Industrial Sensors.
- **Drilled with Through Holes:** for calibrating multi-zone Thermocouples.

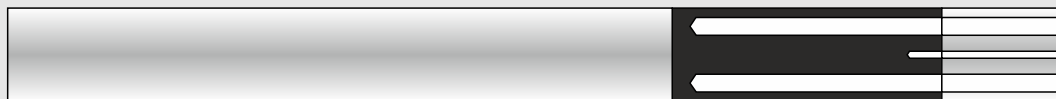


547-07A

Short Metallic Insert, with sensor pockets.

547-07E

Short Ceramic Insert, with sensor pockets.

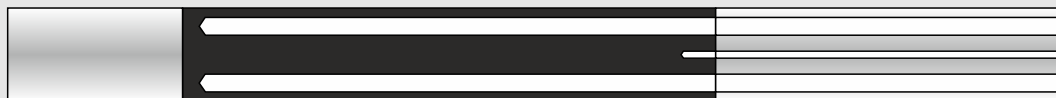


547-07B

Long Metallic Insert, with sensor pockets.

547-07F

Long Ceramic Insert, with sensor pockets.

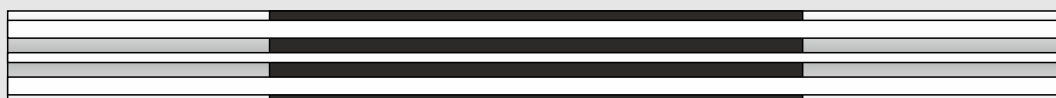


547-07C

Long Metallic Insert, with through holes.

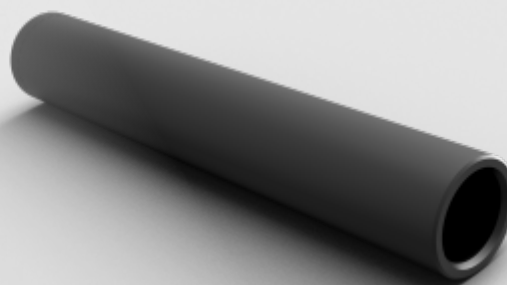
547-07G

Long Ceramic Insert, with through holes.



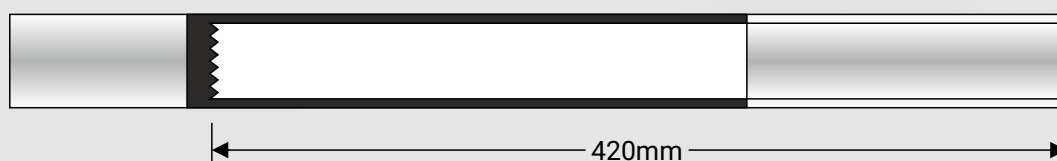
Infrared Thermometer Calibration

- Calibrate Infrared Thermometers using the options of Blackbody Target or Blackbody Fixed Point Cells.



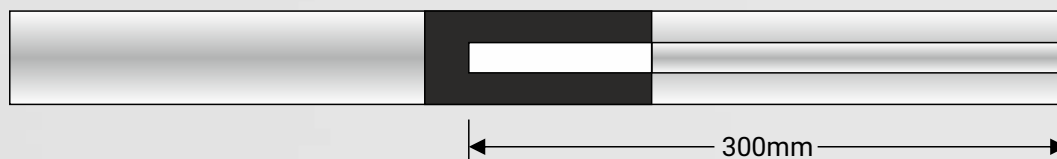
547-07I

Blackbody Target



547-07J / K / L

Blackbody Cell (Zinc / Aluminium / Silver)

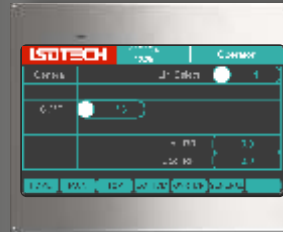


Easy Control with Advanced Features

The 547 Thermocouple Calibration Furnace features a 4.5" full colour high resolution touchscreen controller, enhancing user experience and operational efficiency. This intuitive interface simplifies calibration, allowing easy temperature setting and monitoring. The advanced three-zone temperature control ensures uniformity and stability. Users can schedule and set operating times, saving time and money, and easily manage pre-set temperature routines.



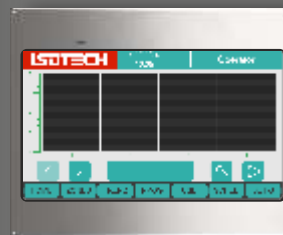
Clear user interface



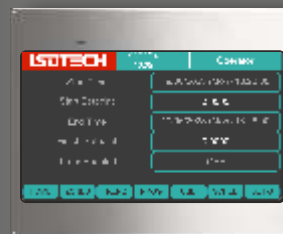
Control the heating rate



Log data & review stability



Set a program



Schedule, set operating times, save time and money



Easily manage pre-set temperature routine



Multi-zone control

For successful temperature calibration
you need more than just a furnace...



**Trust Isotech for the
complete solution.**

881 Thermocouple Homogeneity Scanner

- Determine uncertainty due to inhomogeneity
- Identify contaminated sections of thermocouple wire
- Assess quality of thermocouple wires

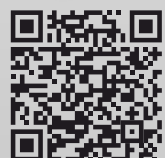
The Isotech Model 881 Dual Heatpipe Thermocouple Homogeneity Scanner provides a fully automated solution to the problem of measuring thermocouple homogeneity.

The operation of a thermocouple relies on the Seebeck Effect which causes an emf to be generated in any region of a thermo element that is exposed to a temperature gradient. Undesirably, nearly all thermocouples develop non-uniformities (inhomogeneities) in their thermoelements during normal use.

If one is to assess the accuracy of a thermocouple, then the inhomogeneity of the thermocouple is a major concern. Increasingly, users and laboratories want to be able to measure thermocouple inhomogeneity.

The scanner can be used to determine:

- If wire/cable manufacturing processes meet quality standards or tolerances.
- Whether a thermocouple is damaged or faulty and unfit for use or calibration.



Standard Thermocouples

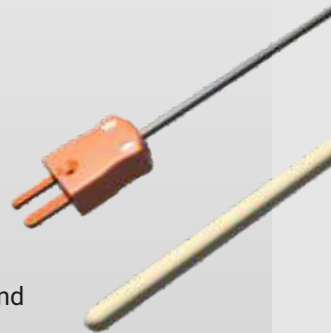
- Type R, Type S, Model 1600 Platinum / Platinum Rhodium
- Gas tight assembly
- Premium grade wire

A range of standard thermocouples calibrated to world leading uncertainties.

Isotech Model 1600: Platinum / Platinum Rhodium available as Type R or Type S these thermocouples are housed in a 99.7% recrystallized alumina sheath, 300 or 600 mm long and can be used to 1600°C.

Isotech Gold / Platinum Thermocouple: This model offers smaller uncertainties than Type R or S using only pure metals in the construction and can be considered as an alternative to HTSPRTs.

NPL Platinum / Palladium Thermocouple: This model manufactured by the National Physical Laboratory (NPL) was developed to operate reliably and accurately to 1500°C and offers superior stability to conventional platinum / platinum rhodium thermocouples. We can arrange option fixed point calibration to offer the lowest of calibration uncertainties, $\pm 0.3^\circ\text{C}$ to 1100°C rising to $\pm 0.55^\circ\text{C}$ at 1330°C.



Measuring System & Automation Software

- Fully automatic calibration
- Design and print certificates
- Calculate coefficients

Use I-Cal Easy to automate sensor calibration, enter up to 20 calibration points and let the software set the calibrator, wait for stability and log the data automatically. Choose the stability criteria and how many points to record at each calibration temperature. Automatic temperature calibration the easy way.

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. For thermocouples use the powerful regression calculator to fit error curves.



Cold Junction Reference Units

- Wide range of reference junctions
- 0°C temperature reference units
- UKAS calibration available

Cold or Reference Junction, Often overlooked the reference junction is important in temperature calibration, see our White Paper, Double Junction Thermocouple: What is it and how can it be used?

We can provide calibrated Multi Junction Laboratory Probes, Model 880 which are suitable for use with all Isotech thermocouple reference units or may be used with any other equipment including ice flasks and ice point reference units.

In addition to the reference junctions we have a full range of Temperature Reference Units that supply a stable and accurate 0°C or elevated reference temperature.



ISOTECH

About Us

The world leader in temperature metrology, with over 40 years' experience.

Our clients include the world's leading laboratories including National Laboratories, leading ISO 17025 Accredited Laboratories and users in all industries.

Why Choose Isotech?

- Isotech has solutions for all calibration needs, from Primary Laboratories maintaining National Standards to the needs of field engineers calibrating industrial sensors on site. Isotech is truly "The Source for Calibration Professionals".
- Global Network - local support. Isotech has over 90 authorized sales agents worldwide! No matter where you are, we can offer local support.
- The world's leading National Metrology Institutes choose Isotech - shouldn't you?

“

As a leading thermocouple manufacturer, it's crucial for us to check with the utmost precision. Isotech equipment consistently provides the accurate measurements we rely on. We've partnered with Isotech for over 30 years, appreciating not just their high-accuracy products but also their exceptional customer service, insightful advice, and genuine feedback.”

Stephen Holt, Technical & Quality Manager, Scott Precision Wire Ltd

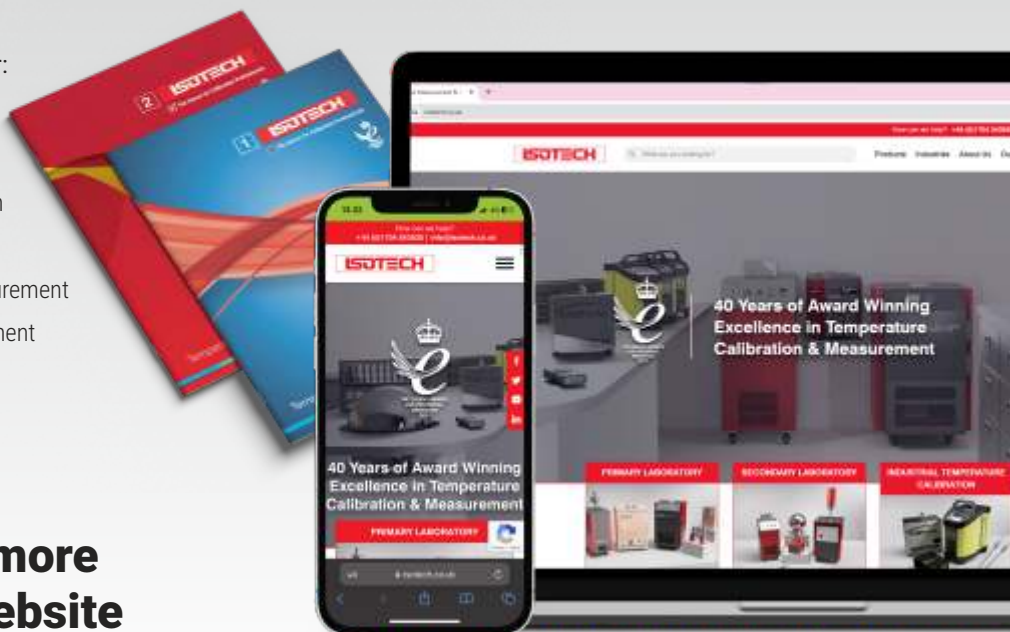
Temperature Metrology Solutions for:

- ITS-90 Primary Standards
- Industrial Sensor Calibration
- Secondary Temperature Calibration
- Infrared Thermometers
- High Accuracy Temperature Measurement
- Thermocouple Referencing Equipment

ISO 17025 calibration services to the smallest of uncertainties and with international recognition



Find out more on our Website



For more information:
ISOTECH.CO.UK

UKAS Calibration Options
ISO 17025

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