ISOCAL 6

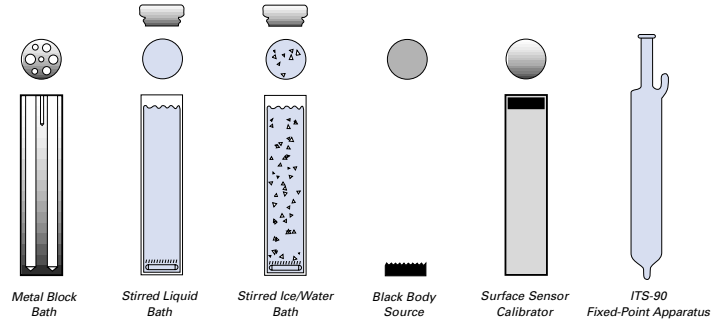
TEMPERATURE CALIBRATION LABORATORY IN A BOX

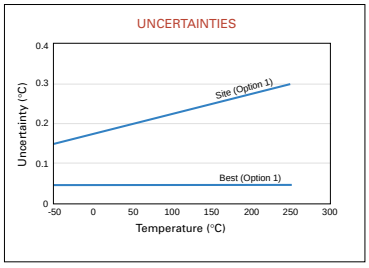
The ISOCAL 6 is the only calibration system in the world (Patent application 9900158.8) to offer you six calibration baths in one product. It is a complete temperature calibration laboratory in one simple easy-to-use package. It is designed to expand with you to fulfill all of your future calibration needs while giving you the flexibility to meet your current budgetary demands.

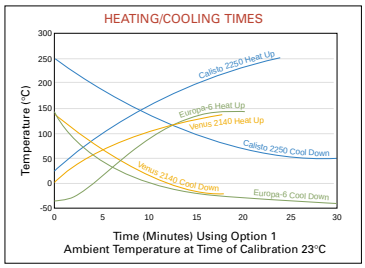
The ISOCAL 6 can calibrate temperature sensors absolutely or by comparison. It will calibrate contact and non-contact sensors including infrared thermometers, surface sensors, mercury in glass thermometers, as well as thermocouples, RTDs, and thermistors of any shape.

There are three different models covering a total temperature range of -65°C below ambient to 250°C. The ISOCAL 6 has interchangeable inserts to give you the most flexible calibration system ever, with unprecedented accuracies from ±0.001°C using fixed point cells.









SPECIFICATIONS

	VENUS 2140	CALISTO 2250	EUROPA-3140
TEMPERATURE RANGE	-55°C below ambient to 140°C (284°F)	ambient to 250°C (482°F)	-65°C below ambient to 140°C (284°F)
STABILITIES OVER 30 MINUTES			
METAL BLOCK BATH	±0.03°C	±0.03°C	±0.03°C
STIRRED LIQUID BATH	±0.025°C	±0.025°C	±0.025°C
ICE/WATER BATH	±0.001°C	N/A	±0.001°C
BLACK BODY SOURCE	±0.3°C	±0.3°C	±0.3°C
SURFACE SENSOR CALIBRATOR	±0.5°C	±0.5°C	±0.5°C
MERCURY TRIPLE POINT	N/A	N/A	±0.0005°C at -38.8344°C
WATER TRIPLE POINT	±0.00025°C at 0.0100°C	N/A	±0.00025°C at 0.01°C
GALLIUM MELT POINT	±0.00025°C at 29.7646°C	±0.00025°C at 29.7646°C	±0.00025°C at 29.7646°C
INDIUM MELT POINT	N/A	±0.0005°C at 156.59850°C	N/A

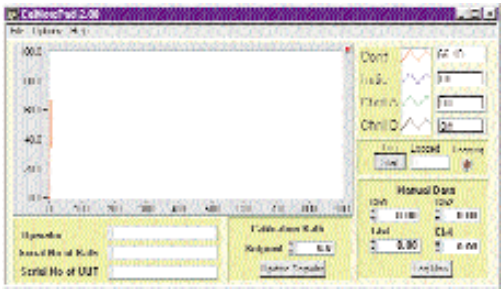
STABILIZATION TIME	10 minutes		
CALIBRATION VOLUME	1 3/8" diameter x 6 1/4" deep		
UNIFORMITY	±0.018°C		
UNITS	°C, °F, or °K Programmable		
OVERALL DIMENSIONS	12" x 7" x 11"		
WEIGHT	VENUS 2140 23 lbs	CALISTO 2250 18 lbs	EUROPA-3140 30 lbs
POWER	110VAC or 240VAC (50/60Hz) [specify]		

SOFTWARE FOR ISOTECH BATHS

Cal Notepad Software

FREE with Purchase of ISOCAL 6

Cal NotePad Software automatically logs and displays the temperature of an Isotech calibration bath together with the sensor under test. The calibration bath temperature can be changed from the PC, or from the calibration baths' controller, and the software displays the temperature changes as they occur on the re-scalable virtual chart display.

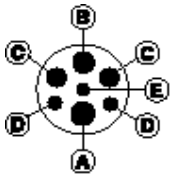


For best calibration results, the unit under examination should be compared to a calibrated standard thermometer. Cal Notepad can record the actual temperature of the bath from either the built-in indicator of an Isotech SITE model or from a variety of external instruments. If the external instrument has two channels, then the unit under test may be connected to channel B for logging. The calibration baths controller value, actual temperature, SITE indicator value or unit under test value may also be entered manually. The manually entered data is combined with that gathered automatically and the resulting file can be opened in external applications, such as Excel, for the creation of reports and certificates.

SIX DIFFERENT INSERTS TO MEET ALL THE DEMANDS OF YOUR CALIBRATIONS

METAL BLOCK BATH

The 35mm diameter by 160mm deep insert can be pre-drilled for you to accommodate a variety of sensor sizes and will give better than 0.1°C accuracy by comparison. The standard drilled metal block insert is shown below.



A. 9.50mm diameter hole, 157mm deep
B. 8.00mm diameter hole, 157mm deep
C. 6.40mm diameter hole, 157mm deep
D. 4.50mm diameter hole, 157mm deep
E. M4 tapped hole for extraction tool

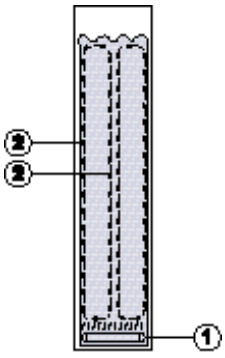
Other special drillings are available to suit your requirements. Please contact TTI, Inc. for further details.

STIRRED LIQUID BATH

Just slide out the metal block insert and replace it with the sealed container of liquid. Take off the lid and you have a high quality liquid bath, 35mm diameter by 160mm deep.

The liquid bath has a variable stirring action so that the stirring action is optimized for the viscosity of the liquid being used, to give near perfect isothermal conditions (typically (±0.005°C). The liquid circulation pattern is shown in the diagram.

The magnetic stirrer (1) at the base of the container spins and imparts a centrifugal force on the surrounding liquid.



The liquid moves under this force to the sides of the container and is replaced by liquid from above. This combined action causes the flow pattern indicated (2).

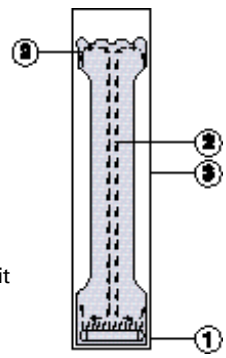
The liquid bath option is ideal for odd shaped sensors, liquid in glass thermometers and multiple sensor calibrations.

STIRRED ICE/WATER BATH

If the liquid is water and the bath set to -4°C, ice crystals will form in the water, creating the perfect stirred ice/water bath for the verification of standard thermometers. (For Venus and Europa models only) Your standard thermometer will have been calibrated, but you need to check regularly that your standard thermometer has not drifted outside its calibration values. The usual way to do this is to regularly check and log the Ice/Water (0°C) value. This option is ideal for re-checking your standards.

You can also set the ISOCAL 6 to 100.1°C and boil the water to give a second fixed temperature.

The magnetic stirrer (1) at the base of the container spins and imparts a centrifugal force on the surrounding liquid.



The liquid moves under this force to the sides of the container, and is replaced by liquid from above. This combined action causes the flow pattern indicated (2).

As the water flows past the ice mantle (3), it is brought to 0°C before coming in contact with the thermometers being calibrated.

BLACK BODY SOURCE

The well of the ISOCAL 6 is black anodized aluminum and by inserting a black matrix into the bottom of the well a black body source with emissivity above 0.995 is created for the calibration of infrared sensors.

The standard thermometer is placed in the calibration hole provided (A), and the temperature is set by the controller.

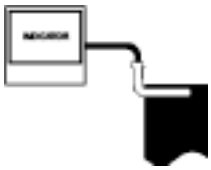
Once stabilized, infrared sensors can be aligned with the cavity and calibrated.



SURFACE SENSOR CALIBRATOR

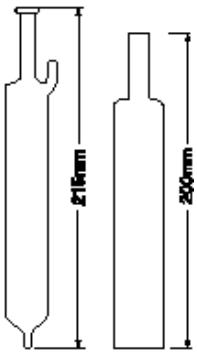
To calibrate surface temperature sensors, a special insert is used in which a platinum resistance thermometer (PRT) is located just below the surface to measure the temperature of the top face.

The surface probe to be calibrated is placed on the top face above the platinum resistance thermometer, and the temperatures are compared.



Inserts of other materials that are more representative of the surface you are measuring can be used. (Contact TTI for further details on special surface sensor inserts.)

ITS-90 FIXED POINT APPARATUS



Fixed Point Calibration—The most accurate temperatures are the Fixed Points of the ITS-90 temperature scale. Of these, the Fixed Points of the Water Triple Point and the Gallium Melting Point have the smallest uncertainties.

These two fixed points can be used in the ISOCAL 6 to obtain uncertainties better than ±0.001°C, enabling quality laboratories to conveniently re-verify their standards.

This option enables you to upgrade your ISOCAL 6 to a full ITS-90 apparatus for the realization of fixed points — again for the re-checking of your standard thermometers — to an accuracy of ±0.001°C. Mercury and Indium fixed points are also available.

Model	Cells Available	Temp. Point
Venus 2140	Water Triple Point	0.01000°C
	Gallium Melt Point	29.76460°C
Calisto 2250	Gallium Melt Point	29.76460°C
	Indium Melt Point	156.59850°C
Europa-3140	Mercury Triple Point	-38.83440°C
	Water Triple Point	0.01000°C
	Gallium Melt Point	29.76460°C

BASIC VS. SITE

Basic version calibrators utilize one controller for the setting and stabilization of the calibration well at your desired temperature. An external reference thermometer should be used as a comparison standard for best accuracies. Site versions were designed for service technicians who need better accuracy in the field, but do not want to carry a separate reference. Site versions incorporate a second indicator to connect and display an external RTD or TC to be used during comparison calibrations. Using comparison techniques with the site version provides accuracies of better than ±0.1°C.

ORDERING INFORMATION

Included in standard delivery: Temperature calibrator, standard metal insert, Cal Notepad Software, NIST calibration certificate, power supply cable, operation manual

VENUS-2140-B+	ISOCAL 6 , -55°C below ambient to 140°C (284°F), basic version, with RS232 & software
VENUS-2140-S+	ISOCAL 6 , -55°C below ambient to 140°C (284°F), site version, with RS422 & software
CALISTO-2250-B+	ISOCAL 6 , 30°C to 250°C (482°F), basic version, with RS232 & software
CALISTO-2250-S+	ISOCAL 6 , 30°C to 250°C (482°F), site version, with RS422 & software
EUROPA-3140-B+	ISOCAL 6 , 30°C to 250°C (482°F), site version, with RS422 & software
EUROPA-3140-S+	ISOCAL 6 , 30°C to 250°C (482°F), site version, with RS422 & software
ISO6-INS-M	Standard metal insert for ISOCAL 6 (2 X 4.5mm, 2 X 6.4mm, 1 X 8mm, 1 X 9.5mm)
ISO6-INS-L	Standard liquid container for ISOCAL 6 (alcohols, water, or oils)
ISO6-INS-B	Blackbody target for ISOCAL 6
ISO6-INS-SK	Standard surface sensor calibration insert for ISOCAL 6
ISO6-INS-MY	ITS-90 fixed point, Mercury triple point cell for ISOCAL 6
ISO6-INS-FW	ITS-90 fixed point, water triple point cell for ISOCAL 6
ISO6-INS-FI	ITS-90 fixed point, Indium fixed point cell for ISOCAL 6
ISO6-INS-FG	ITS-90 fixed point, Gallium fixed point cell for ISOCAL 6
ISO6-INS-BLANK	Blank, undrilled, M4 tapped insert
ISO6-CC	Carrying case for ISOCAL 6
ISO6-MAGNET	5 X Magnetic disks for liquid inserts
935-14-82	Standard probe for site models
CAL-ISO6	NIST calibration