Tecal Series of Dri-Block® Calibrators

The Tecal Block Calibrator series are used as portable temperature calibrators in a wide variety of industries for checking the calibration of thermocouples, RTDs and liquid filled sensors. The checking of temperature is vital in numerous industrial processes – engines, machines, boilers, pumps, storage rooms, air conditioners, compressors used in power stations, chemical plants, refineries, offshore platforms, ships, steel works, instrument companies are all typical application areas.

The Tecal series comes in two different formats. The Tecal 'S' range for simple calibration and the Tecal 'H' range for applications where greater flexibility is required. With the Tecal 'S' range, calibration is simple, quick and easy.

1. Select the temperature scale required (°C or °F) and calibration temperature on the LED display.
2. Place insert into the hole in the block.
3. Place sensor under test into the insert.
4. Connect sensor to reading device (DVM, Digital Thermometer or sensor controlling circuit etc.)
5. Allow block to stabilise for at least 10 minutes once it has reached the desired temperature.
6. Compare temperature reading of external thermometer with the reading on the Tecal LED display.
7. Repeat the above steps for all calibration temperatures until the calibration is complete.

The Tecal 'H' range allows greater flexibility where several calibration programs may need to be carried out in the field.

1. The 'H' range is fitted with a 4 line by 20 character LCD and an 8 button keypad for creating and using calibration programs (setting temperature, ramp rate and holding time) and storing data at each temperature.
2. The LCD and keypad allow the user to configure the calibrator for:
   - A normal calibration of temperature probes (analogous to the 'S' range).
   - A switch test input for monitoring hydraulic thermostats, including the ability to pause at the temperature where switching occurs (very useful when the temperature for switch changeover is not known).
   - A calibration using the User Probe Interface (UPI), (see page 8) which allows storage of both the block temperature and the reading of the test sensor which is connected to the UPI.

All the Tecal models have an RS-232 interface for data and program transfer or real time control using Calsoft (see page 7). The 'S' range requires the computer to be continuously connected to the Tecal calibrator when using Calsoft. On the other hand, the 'H' range can calibrate probes independently of the computer and at the end of the day, the user can download the test results from the Tecal calibrator to the computer to print out the appropriate calibration certificate(s).

There is a set of commands that allow third party applications to be developed. For further details, please contact Techne Sales Department.

All Tecal calibrators have a large heater block (aluminium for the Tecal 140 & 425 models, and aluminium/bronze for the Tecal 650) providing excellent uniformity and stability. This heater block can accommodate large multi-hole inserts allowing calibration of several probes at one time.

Techne is one of the few companies that realised the importance of a measuring zone which is now becoming essential after the release of the new European regulations on calibrating block calibrators.

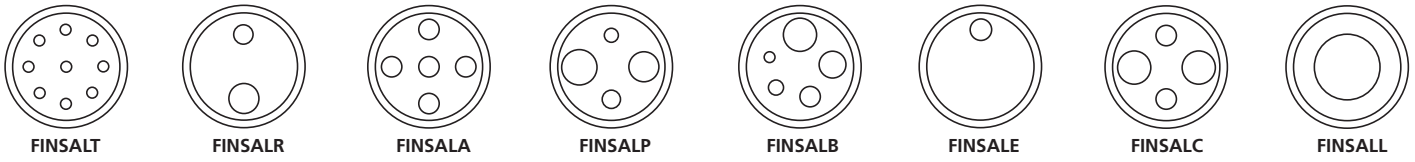
All Techne units are designed and manufactured to BS EN 1S0 9001: 1994 and carry the CE mark. All Techne equipment conforms to the EMC and Low Voltage Directives. Some units are manufactured for Techne to our specifications.

Inserts Available
5 x 6mm
1 x 10mm, 8mm, 6mm, 4.5mm, 3mm
2 x 6mm, 2 x 10mm
2 x 6mm, 2 x 12mm
1 x 6mm
1 x 6mm, 9mm
1 x 4mm, 5mm, 9mm, 11mm
1 x 20mm
9 x 3.18mm
5 x 1/4"
1 x 3/8", 5/16", 1/4", 3/16", 1/8"
2 x 1/4", 2 x 3/8"
2 x 1/4", 2 x 1/2"
1 x 1/4"
1 x 9/16"
1 x 5/8"
1 x 11/16"
1 x 3/4"

Immersion Depth
114.3mm

Tecal 140S/H This temperature calibrator is ideal for calibrating temperature sensors used in the food and pharmaceutical industries as well as calibrating any sensors used in the temperature range outlined in the specification below.

S Version: Set required Temperature and Calibrate
H Version: Set required Temperature and Calibrate also programmable for switch test and ramp rate etc.



FINSALT FINSALR FINSALA FINSALP FINSALB FINSALE FINSALC FINSALL

The Tecal 140S provides a complete system for calibrating most types of thermal sensors used in the temperature range of -40°C to 140°C which includes "K" type thermocouples commonly used in the food industries, cold storage rooms and environmental monitoring systems.

Where automation in both the field and laboratory are required, the combination of the Tecal 140H with the UPI (see page 8) saves time and money. The user can set the program and leave the unit to calibrate the probes, automatically storing the results in memory. This allows the user to attend to other tasks and when convenient download the results to a computer to print the calibration certificate.

Using advanced peltier technology and state-of-the-art mechanical and electrical components, these calibrators can rapidly cover the complete temperature range where speed is of the essence without loss of accuracy or stability. A metal block with a defined measuring zone of 50mm from the bottom of the block allows for different length/active area sensors. Although the quoted accuracy and stability is ±0.3°C & ±0.05°C respectively, one can often achieve an accuracy of ±0.1°C and a stability of ±0.02°C with high class RTDs and thermocouples.

TECHNICAL DATA

Minimum temperature	45°C below ambient[1]
Maximum temperature	140°C
Temperature accuracy in measuring zone	±0.3°C
Temperature uniformity in measuring zone	±0.2°C[2]
Measuring zone	0 to 50mm from base of well
Temperature stability after 10mins	±0.05°C
Display resolution	0.1°C
Heating rate, 20°C to 100°C	5 minutes
Cooling rate, 100°C to 0°C	9 minutes
Programmable ramp rate, °C/min	0.1 to 10, on H version
Switch test	on H version
Comms port, 9 way D type	Full bi-directional RS-232
Weight, kg	14.0(S), 14.4(H)
Dimensions HxWxD, mm	285x190x426

[1] In a maximum ambient temperature of 20°C and when using the CH-5 Chiller a temperature of -40°C can be achieved.
[2] At 100°C

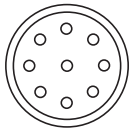
See page 34 for full range of inserts available.

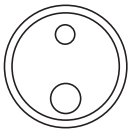
Inserts Available
5 x 6mm
1 x 10mm, 8mm, 6mm, 4.5mm, 3mm
2 x 6mm, 2 x 10mm
2 x 6mm, 2 x 12mm
1 x 6mm
1 x 6mm, 9mm
1 x 4mm, 5mm, 9mm, 11mm
1 x 20mm
9 x 3.18mm
5 x 1/4"
1 x 3/8", 5/16", 1/4", 3/16", 1/8"
2 x 1/4", 2 x 3/8"
2 x 1/4", 2 x 1/2"
1 x 1/4"
1 x 9/16"
1 x 5/8"
1 x 11/16"
1 x 3/4"

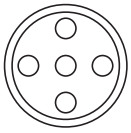
Immersion Depth
114.3mm

Tecal 425S/H These calibrators use large aluminium blocks surrounded by band heaters to give fast heating times and provide high accuracy, uniformity and stability up to 425°C.

S Version: Set required Temperature and Calibrate
H Version: Set required Temperature and Calibrate also programmable for switch test and ramp rate etc.


FINSALT


FINSALR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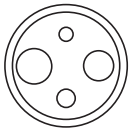
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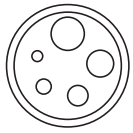
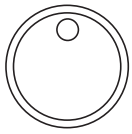
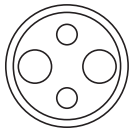
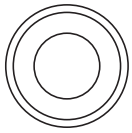

FINSALB


FINSALE


FINSALC


FINSALL

Both 425 models are equipped with a large fan in order to quickly cool the blocks to 20 degrees above ambient. Suitable for many applications in both the field and laboratory as described in the introduction.

TECHNICAL DATA

Minimum temperature	20°C above ambient
Maximum temperature	425°C
Temperature accuracy in measuring zone	±0.3°C
Temperature uniformity in measuring zone	±0.2°C[1]
Measuring zone	0 to 50mm from base of well
Temperature stability after 10mins	±0.05°C
Display resolution	0.1°C
Heating rate, 20°C to 400°C (230/120v)	15 minutes
Cooling rate, 400°C to 100°C	25 minutes
Programmable ramp rate, °C/min	0.1 to 10, on H version
Switch test	on H version
Fan cooling	Automatic
Comms port, 9 way D type	Full bi-directional RS-232
Weight, kg	9.2(S), 9.6(H)
Dimensions HxWxD, mm	285x190x426

Optional Accessory:
The Cooling Probe can be used to rapidly cool the insert – Chilled water passes through the probe that fits inserts with 10mm ø hole or larger

[1] At 300°C

See page 34 for full range of inserts available.

Inserts Available
5 x 6mm
1 x 10mm, 8mm, 6mm, 4.5mm, 3mm
2 x 6mm, 2 x 10mm
2 x 6mm, 2 x 12mm
1 x 6mm
1 x 20mm
1 x 19.5mm
1 x 3mm, 4mm, 6mm, 8mm, 10mm
1 x12mm
1 x15mm
1 x 19.5mm
1 x 3/8", 5/16", 1/4", 3/16", 1/8"
2 x 1/4", 2 x 3/8"
2 x 1/4", 2 x 1/2"
1 x 1/4"
1 x 9/16"
1 x 5/8"
1 x 11/16"
1 x 3/4"

Immersion Depth
152.4mm

Tecal 650S/H This temperature calibrator is ideal for calibrating temperature sensors used in the food and pharmaceutical industries as well as calibrating any sensors used in the temperature range outlined in the specification below.

S Version: Set required Temperature and Calibrate
H Version: Set required Temperature and Calibrate also programmable for switch test and ramp rate etc.


FINSABR


FINSABA


FINSABP


FINSABB


FINSABE


FINSABC


FINSABL

The 650 models have large aluminium-bronze blocks which can house large single or multi-hole inserts. These inserts can accommodate probes to a depth of 152.4mm providing high stability and uniformity. All models are equipped with high-powered band heaters and two fans in order to rapidly heat and cool the temperature probe block to the required range of temperatures.

[1] At 400°C

See page 34 for full range of inserts available.

TECHNICAL DATA

Minimum temperature	25°C above ambient
Maximum temperature	650°C
Temperature accuracy in measuring zone	±0.4°C
Temperature uniformity in measuring zone	±1°C[1]
Measuring zone	0 to 50mm from base of well
Temperature stability after 10mins	±0.09°C
Display resolution	0.1°C
Heating rate, 20°C to 600°C	35 minutes
Cooling rate, 600°C to 200°C	30 minutes
Programmable ramp rate, °C/min	0.1 to 10, on H version
Switch test	on H version
Comms port, 9 way D type	Full bi-directional RS-232
Weight, kg	11.8(S), 12.2(H)
Dimensions H x W x D, mm	285 x 190 x 426

Optional Accessory:
The Cooling Probe can be used to rapidly cool the insert – Chilled water passes through the probe that fits inserts with 10mm ø hole or larger

FOR ORDERING INFORMATION SEE PAGE 33

Calsoft software for use with Tecal Block Calibrators. Allows programming of calibration procedure (window based) via a PC.

Calsoft

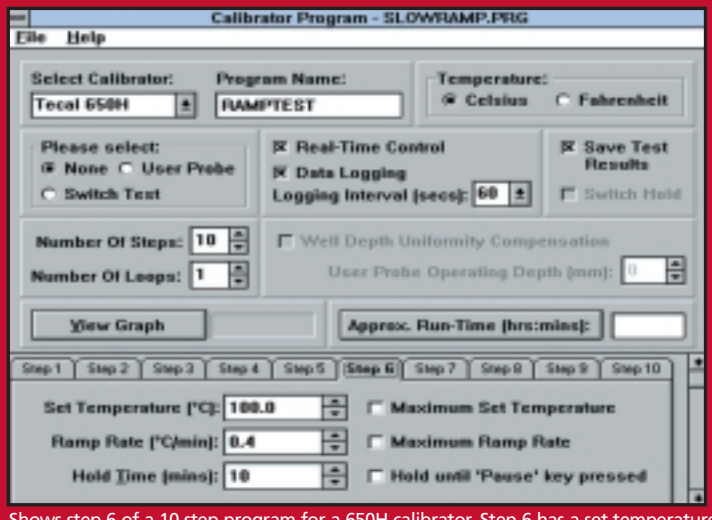
The S range of the Tecal series must be connected to the computer at all times in order to run programs set up by CalSoft.

FOR BOTH H and S MODELS, CALSOFT ENABLES YOU TO:

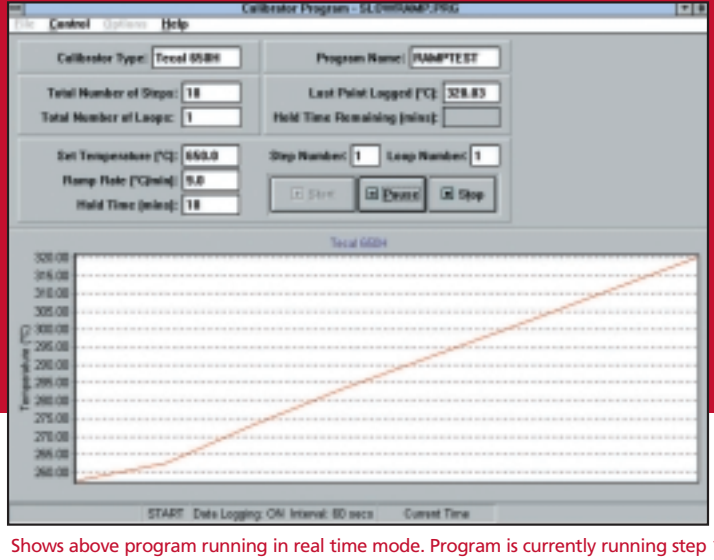
- Create, open, save and print programs
- Log data from the calibrator while connected to the computer
- Open, save, view and print logged data
- Run a program in real time mode

FOR H MODELS ONLY, CALSOFT ENABLES YOU TO:

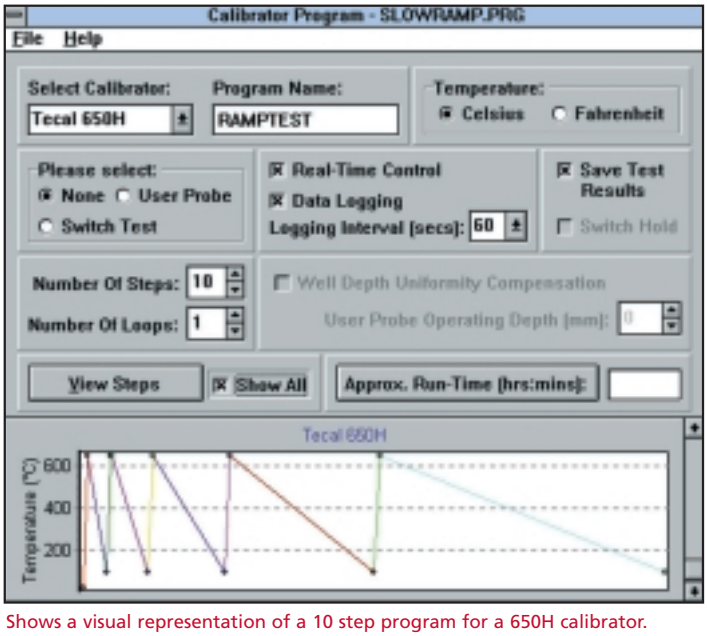
- Select 3 possible options to carry out a calibration:
- Perform a calibration where you input the temperature of the probe manually
- Perform a calibration using the UPI (see page 8)
- Perform a calibration requiring a switch test
- Send programs to the calibrator
- Retrieve programs from the calibrator
- Retrieve test results from the calibrator
- Erase test results



Shows step 6 of a 10 step program for a 650H calibrator. Step 6 has a set temperature of 100°C, a ramp rate of 0.4°C per minute, and a hold time of 10 minutes.



Shows above program running in real time mode. Program is currently running step 1 of the 10 step program, with data being logged and graphed at 60 second intervals.



Shows a visual representation of a 10 step program for a 650H calibrator.

User Probe Interface (UPI)

The UPI can automatically calibrate your temperature sensors without the need for user intervention. Simply connect the UPI to the front panel of any of the Tecal 'H' range of dri-block calibrators.

With the User Probe Interface (UPI) you can realize a fully automated and unattended calibration of your temperature sensors saving both time and money. Simple install your sensor into the block insert and connect the wiring to the appropriate front panel terminals, switch the UPI on and select your sensor type.

The User Probe Interface accepts types K, J, N, T and E thermocouples along with 100 and 1000 ohm 3 and 4 wire RTD's. You can also connect the UPI in series with your 4 to 20mA loop and the current readiing of your transmitter will be displayed. Sensor wires are connected to standard 4mm banana socket screw down posts.

TECHNICAL DATA

Probe	Type	Resolution	Accuracy	Range
K	t/c	0.1°C	±0.5°C or ±0.3%	-50 to 650°C
J	t/c	0.1°C	±0.5°C or ±0.3%	-50 to 650°C
N	t/c	0.1°C	±0.5°C or ±0.3%	-50 to 650°C
T	t/c	0.1°C	±0.5°C or ±0.3%	-50 to 400°C
E	t/c	0.1°C	±0.5°C or ±0.3%	-50 to 650°C
100Ω	RTD	0.1°C	±0.3°C or ±0.1%	-50 to 650°C
1000Ω	RTD	0.1°C	±0.3°C or ±0.1%	-50 to 650°C
0-10	mA	1.0µA	±2.0µA or ±0.002mA	0 to 10mA
10-1 to 20.0	mA	1.0µA	±2.0µA or ±0.02%	10.1 to 20mA

Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.

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