

INSTRUCTION MANUAL

MODEL: ETC 600/ETC600-2



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1.0 BEFORE YOU START:**1.1 SYMBOLS USED:**

The following are the symbols used throughout the manual.

S.NO	SYMBOL	DESCRIPTION
1		Read the user manual before operating the instrument.
2		Warning- conditions that may pose hazards to the user.
3		Hot surface- areas which are at high temperature.
4		Special information
5		Caution-condition that may damage the instrument.
6		Electric shock- condition that may pose shock to the user.

2.0 INTRODUCTION:

Dry block Medium Temperature Calibrator - Economic – Model ETC600 is an ideal temperature calibrator for calibration of RTD's, T/C's, Bi-metal thermometers and temperature switches. The range of the instrument is 50°C - 600°C with an accuracy of $\pm 0.1\%FS + 1$ digit. The calibrator can be used to calibrate virtually temperature sensor of size up to 19.5mm diameter. The versatility of this calibrator helps to calibrate sensors from 3.5mm dia to 19.5mm dia.

Features

- Portable
- Light weight
- Calibration at site
- Rugged field use
- Fast and reliable
- No dangerous Liquids
- Over voltage protection-Thermal Switch

CERTIFICATION

United certifies that the bath is a quality product and meets its intended use and satisfies the published specifications at the time of shipment.

TECHNICAL ASSISTANCE

Please contact the manufacturer if you require technical assistance.

WARRANTY

12 months factory warranty

This warranty only cover manufacturing defects and becomes invalid if the instrument has been subjected to unauthorized intervention and / or use.

3.0 SAFETY INFORMATION:

Use the instrument only as specified in this manual. Otherwise, the protection provided by the instrument may be impaired. Refer to the safety information below and appearing throughout the manual.

a.  :

- This calibrator is designed for interior use only.
- Inspect the instrument for damage before each use.
- Do not use the instrument if it appears damaged or operates abnormally.
- If the instrument is used in a manner not in accordance with the equipment design the operation of the instrument may get damaged.
- Do not place the instrument under a cabinet or other structure. Leave enough clearance to allow for safe and easy insertion and removal of probes.

- Do not drop the probe stems into the well. This type of action can cause a shock to the Sensor.
- Do not use this instrument for any application other than the calibration work. Any other use of the instrument may cause unknown hazards to the user.
- Do not operate near flammable materials.
- Calibration Equipment should only be used by Trained Personnel.
- Completely unattended operation is not recommended.
- This instrument and the thermometer probes are sensitive instrument that can be damaged. Always handle those devices with care.
- Do not leave the inserts in the instrument for prolonged periods. It may cause damage due to high operating temperature of the instrument.
- Do not slam the probe sheath into the well. It may cause a shock to the sensor and affect the calibration.
- Do not operate this instrument in an excessively wet, oily, dusty, or dirty environment.

B. :

- This instrument must be plugged into a 230 VAC, 50Hz (optional 115V, 60Hz), electric outlet only. The power cord of the instrument is equipped with a three-pin grounding plug for your protection against electrical shock hazards. It must be plugged directly into a properly grounded three-pin socket. The receptacle must be installed in accordance with local codes and ordinances. Do not use an extension cord or adapter plug.
- If supplied with user accessible fuses, always replace the fuse with one of the same rating, voltage, and type.
- Always replace the power cord with an approved cord of the correct rating and type.
- If a main power supply fluctuation occurs, immediately turn off the instrument. Power bumps from brown-outs could damage the instrument. Wait until the power has stabilized.

C.

- Always operate this instrument at room temperature between 10°C and 40°C. Allow sufficient air circulation for the instrument by leaving at least 20cm of clearance around the instrument.
- Do not turn off the instrument at temperatures higher than 50°C. This would create a hazardous situation. Select a set-point less than room temperature and allow the Instrument to cool before it turning OFF.
- Do not use the instrument if the Cooling fan located at the bottom of the Instrument is out of order.
- Ensure a free supply of air to the Fan Grill located at the bottom of the Instrument.
- Check that earth connection for the instrument is present and attach Power Cord.

D.

- Do not touch the well access surface of the instrument.

- Do not touch the Well or the Insert while the calibrator is heating up, they may be very hot.
- Do not touch the tip of the sensor when it is removed from the Insert / well, it may be very hot.
- Do not touch the handle of the calibrator during use – it may be hot.

4.0 QUICK START:

4.1 UNPACKING

Unpack the instrument carefully and inspect it for any damage that may have occurred during dispatch. If there is transit damage, notify United immediately. Check the parts against the list given below. If any of the parts are missing or damaged, please contact us.

Verify that the following components are present

Standard:

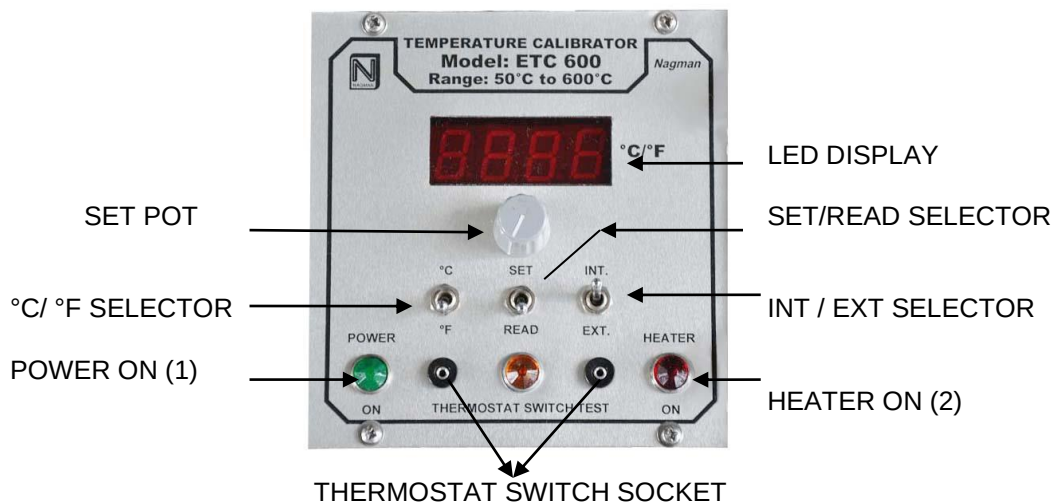
- Calibrator
- Mains Power Cord
- Inserts as per specifications, (or) to suit
- Tool for Removing Inserts
- Test Probe
- Operational Manual
- Calibration Certificate

Optionals:

- Multi-hole insert

5.0 Features of the Calibrator:

5.1 Control Panel



1. POWER ON:

If calibrator is ON the Green neon lamp glows.

2. HEATER ON:

This indicates the power flow to the heaters. When the temperature reaches the set point the indicator starts flashing which means only pulse O/P signal is going to the heater for maintaining the set temperature.

3. °C/°F Selector;

This toggle Switch is used for selection of Degree Centigrade or Fahrenheit unit.

4. INT/EXT Selector:

This switch should be maintained in the 'INT' position in normal operating mode. EXT position is used while measuring temperature from an external temperature probe. At this position calibrator function will switch off and instrument act as an indicator.

5. SET/READ SELECTOR:

Set position is for setting the SET Temperature and the switch should be switched over to Read position after setting the temperature.

6. SET POT:

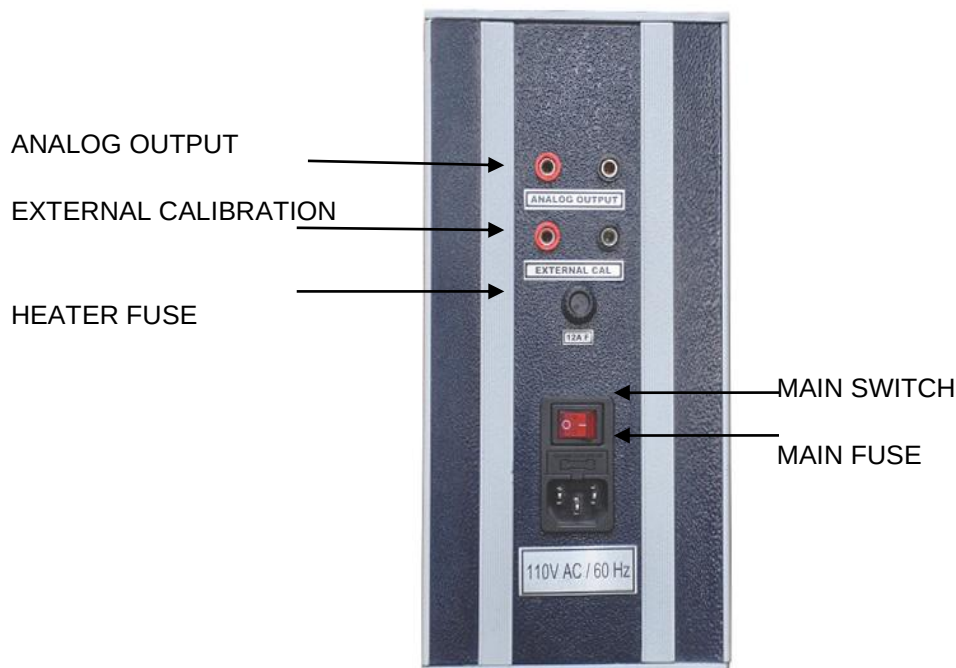
This Potentiometer is for setting the SET Temperature for the calibrator.

7. LED DISPLAY:

The 3 1/2 Digit LED display indicates the SET/READ temperature depending upon the position of the Set/Read Selector switch.

8. THERMOSTAT SWITCH SOCKET:

This is for testing the Thermostat switch relay contact. Connect the thermostat relay contacts to the socket provided.

5.2 POWER INPUT SIDE PANEL:

1. MAIN FUSE:

The calibrator is protected from short circuit or over load current by fuse of 6.3A (12A for 110v supply) located in the power socket in the side panel of the calibrator.

2. MAINS SWITCH:

This is for switching the power ON/OFF to the calibrator.

3. HEATER FUSE:

A fuse of 6.3A (12A for 110v power supply) for protection of Heater.

4. ANALOG OUTPUT:

The analog output can be connected to recorders for recording the temperature variation. The analog output signal will be 10mV per °C. (DC offset if any has to be ignored). This is located on the side panel of the calibrator.

5. EXTERNAL CAL:

The External Probe can be connected to this socket and the INT/EXT toggle switch should be in EXT position. Then the LED display indicates the Temperature of the external probe. This is located on the side panel of the calibrator

6.0 OPERATING THE CALIBRATOR:**6.1 Operational Procedure**

- a. Remove Calibrator out of its carrying case and place it such that the air intake at the bottom is not obstructed.
- b. Connect the power cable to the Calibrator.
- c. Before applying power to the calibrator, determine the size (inner diameter) of the insertion tube to be used. For example if the user desires to calibrate check probe of ¼" outer diameter, use insertion tube of inner diameter ¼".
- d. Insert the sensors, which are going to be calibrated into the corresponding hole of the insert.
- e. Switch on the instrument by Mains ON/OFF switch. Green neon lamp marked "POWER ON" in the control plate will glow.
- f. Set °C/°F selector switch to required temperature Unit.
- g. Set the SET/READ switch to SET position and the INT/EXT switch to INT position, set the temperature to the required value.
- h. Switch the >>SET/READ<< switch to >>READ<< position. Red noen lamp marked "HEAT" in the control plate will permanently glow. Just before the set temperature is reached, this lamp will start flashing.
- i. Allow the bath to stabilize at the Read temperature.
- j. Connect test probe to the indicator and note down the readings of test probe.
- k. Repeat steps **g to j** for other set of calibration points.
- l. After calibration is over, set the bath temperature to ambient and allow the bath to cool.

- m. Set the switch >>INT/EXT<< switch to >>EXT<< position.
- n. After reaching the ambient temperature, switch off the power supply.

6.2 Switch Test

- a) Connect the output of the Thermostat switch to the switch test sockets using the test probes supplied.
- b) If the thermostat switch is of "Normally Closed" type the LED will glow and will stop glowing when the switch change its state.
- c) If the thermostat switch is of "Normally Open" type the LED will not glow initially and will glow when the switch changes its state

7.0 TECHNICAL SPECIFICATIONS:

All specifications are given with an ambient temperature of $27 \pm 2^\circ\text{C}$

MECHANICAL SPECIFICATIONS

Dimensions w x d x h	270 x 240 x 124 (ETC600) 270 x 306 x 124 (ETC600-2)
Weight	7 Kgs Approx(ETC600) 9 Kgs Approx(ETC600-2)
Well Diameter	$\Phi 25\text{mm}$
Immersion Depth	110mm (ETC600) 190mm (ETC600-2)
Interchangeable Thermo wells	$\frac{1}{4}"$ & $\frac{1}{2}"$ Std or to suit

POWER SUPPLY

Line Voltage / frequency	230/115 VAC $\pm 10\%$ / 50Hz
Power Consumption	1200 Watts
Power cord	15A

ENVIRONMENT

Ambient operating temperature range	15 – 40°C
Storage Temperature Range	10 – 50°C
Humidity Range	40 – 75% RH
Protection Class	IP10

READOUT SPECIFICATIONS

Temperature Units	$^\circ\text{C}$ / $^\circ\text{F}$
Resolution	1°C

THERMAL SPECIFICATIONS

Temperature Range	50 - 600°C
Accuracy	$\pm 0.1\%$ FS + 1 Digit (ETC 600) $\pm 0.15\%$ F.S+1digit.(ETC 600-2)
Stability	$\pm 0.05^\circ\text{C}$

Stabilization Time	15 Minutes
Heating Time (Ambient to maximum)	18 minutes (approx) (ETC 600) 40 minutes (approx) (ETC600-2)
Cooling time (to 100°C)	60 minutes (ETC 600) 100 minutes (ETC 600-2)

INPUT SPECIFICATIONS**Switch Test Input**

Internal Power Supply	7 VDC Nominal
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OUTPUT SPECIFICATIONS

Analog Output (F.S)	10 mV per °C
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8.0 STORING AND TRANSPORTING THE CALIBRATOR:

The following guidelines should always be observed when storing and transporting the calibrator. This will ensure that the instrument and the pump remain in good working order.

Storing:

- Switch OFF the calibrator using the power control switch.
- Turning OFF the calibrator during the calibration process will not damage the instrument.
- If you intend to store the calibrator in the Packing Box after use, you must ensure that the instrument has cooled to a temperature at 10°C / 50°F above ambient temperature before placing it in the Packing Box

Transporting:

The Inserts must be removed to avoid damage to the instrument if the calibrator is to be transported long distances

9.0 REPLACING THE FUSE:

Replace the main fuse by following the below instructions

1. Identify the main fuse in the fuse box in the socket.
2. Open the lid of the fuse box using a screwdriver.
3. Replace the fuse with the main fuse rating 6.3A (12A for 110v).

Replace the Heater fuse by following the below instructions

1. Identify the heater fuse in the corresponding fuse holders marked in the enclosure of the equipment.
2. Open the fuse holder in anti-clockwise direction.
3. Replace the fuse with the fuse rating as 6.3A (12A for 110v)



Do not remove the fuse box from the socket until the power cord has been disconnected.

If the fuse blows immediately after you have replaced them, the calibrator should be returned to the manufacturer for service.

10.0 MAINTENANCE:

Clean the instrument by following the below instructions.



Before cleaning the calibrator, you must switch it off, allow it to cool down and remove all cables.

Users should/ must carry out the following cleaning procedures as and when required.

- **The exterior of the instrument** Clean using water and a soft cloth. The cloth should be wrung out hard to avoid any water penetrating the calibrator and causing damage.
- **The Insert** Must always be clean and should be regularly wiped using a soft lint free, dry cloth. You must ensure that there are no textile fibers on the Insert when it is inserted in the well. The fibers may adhere to the well and damage it.

10.1 Adjusting and calibrating the instrument

You are advised to return the calibrator to United or an accredited laboratory at least once a year for calibration.