

MANUAL



Medium Temperature
DRY BLOCK CALIBRATOR
ETC 600

BRIEF PROFILE



An ISO 9001-2015 certified Instrumentation company (since 1972) serving Industries in India & Worldwide thro' the Manufacture & Supply of World-Class Calibration Instruments & Systems like Temperature, Pressure & Signal Calibrators, Black Body Calibration Sources, Pneumatic & Hydraulic Hand Pumps, Dead Weight & Comparison Testers, Calibration Test Benches, etc.

Dear User,

Thank you for selecting Nagman's Medium Temperature Dry Block Calibrator and becoming a proud owner of this Calibration Instrument.

We have strived hard to ensure the accuracy of the contents of this manual. We would appreciate any suggestions/feedback to correct any errors noticed and to improve the quality of contents of this Manual

Specifications are subject to change owing to continuous development and we reserve rights to effect Changes / Modifications to this Manual.

Read the Instructions before starting to use the Product.

Wishing you for a long association with us.

For any service related issues, please contact service@nagman.com

VERSION CONTROL

Version No.	Updated on	Updated by
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1. INTRODUCTION

Medium Temperature Calibrator (Dry Block type - Economy) Model : ETC 600 is an ideal Temperature Calibrator for Calibration of RTD's, Thermocouples, Temperature Switches, Indicators, etc.

The range of the instrument is 50°C to 600°C with an accuracy of $\pm 0.1\%$ F.S. + 1. The calibrator can be used to calibrate Temperature Sensor of size up to 30 mm diameter.

2. SPECIFICATION

Range	50°C to 600°C
Resolution	1°C
Display	Digital Display, 3½ digit LED
Accuracy	±0.1% F.S. + 1
Stability	±0.5°C
Temperature Readout	°C / °F Selectable
Well Diameter	30 mm
Immersion Depth	110 mm
Heating Time (Ambient to max.)	18 Minutes approx.
Cooling Time (to 100°C)	60 Minutes approx.
Multihole Thermowell	2 x 1/4" + 1 x 1/2" Probe
Switch Test Facility / Supply	Provided / 7 VDC Nominal
Power Supply	115V / 230V AC or Dual
Instrument Dimensions (L x W x H)	270 x 124 x 240 mm
Instrument Weight	7 Kgs.

Environment

Operating Temperature Range (Ambient)	:	15 – 40°C
Storage Temperature Range	:	10 – 50°C
Humidity Range	:	40 – 75% RH
Protection Class	:	IP 10

Readout Specifications

Temperature Units	:	°C / °F
Resolution	:	1°C

Input Specification

Switch Test Input

Internal Power Supply	:	7V DC Nominal
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Output Specification

Analog Output (FS)	:	10 mV per °C
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3. STANDARD DELIVERY & OPTIONAL ACCESSORIES

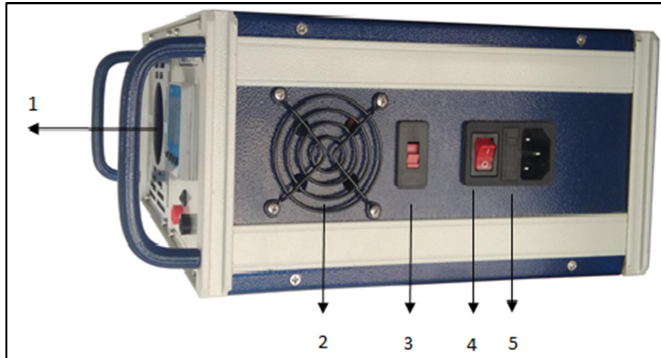
Standard Delivery

- Basic Instrument
- Test Leads, Mains Cable & Spare Fuses
- Insertion Tubes (to suit 2 x1/4" & 1/2" probes)
- Tool for Insertion Tubes
- Traceable Calibration Certificate
- Carrying Case
- Instruction Manual

Optional Accessories

- Additional Thermowells / Insertion Tubes (to choose from) :
 - a) Single hole standard sizes to suit : 1/8", 1/4", 3/8", 1/2", 3/4" & 3, 4, 5, 6, 7, 8, 10, 12, 13, 15, 17, 19 & 21 mm probes
 - b) Multi hole (Typical) : (1×6 + 1×8) or (3×4) or (1×10 + 1×4) mm
- Calibration Certificates are issued in Accordance with our Scope as granted by NABL per ISO/IEC 17025:2017 Standards
- Dual Voltage Selection

4. PARTS IDENTIFICATION



- 1) Heater Block
- 2) Vent
- 3) Selector Switch [230V / 115V AC Input Supply]
- 4) Main Switch [Instrument ON / OFF]
- 5) Main Fuse [6.3A-230V AC / 12A-115V AC] located in the power socket, side panel of the calibrator.







5. CONNECTION DIAGRAM



1. Calibrator
2. Temperature Sensor (UUT)
3. Reference Instrument (for UUT)

6. SAFETY INSTRUCTIONS

Symbols Used

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



- 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 operate this instrument in an excessively wet, oily, dusty, or dirty environment, or in explosive zones.



- Check that earth connection for the instrument is available and then plug the Power cord
- Always operate this instrument at room temperature between 15°C and 40°C. Allow sufficient air circulation for the instrument by leaving at least 20 cm of clearance around the instrument.
- Do not turn off the instrument at temperature higher than 50°C. This would create a hazardous situation. Select the set-point to 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.

STORING AND TRANSPORTING THE CALIBRATOR :

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

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 (maximum at 10°C / 50°F – very close to ambient temperature) above ambient 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 to long distances



- 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 (as well as the portion immersed in the well) 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.



- This instrument must be plugged into a 230V AC, 50Hz (Optional 115V AC, 60Hz), electric outlet only.
- The power cord of the instrument is equipped with a three-pin grounding plug for 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.
- Turn off the Instrument immediately, during main power fluctuation. Power bumps from brown-outs could damage the instrument. Wait until the power has stabilized.
- 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.

7. OPERATING INSTRUCTION

- Connect the power cable to the Dry Block Calibrator.
- Switch ON the instrument
- Set the required temperature in the PID Controller as follows.
 - Press “▲” (F1) key to increase the set temperature.
 - Press “▼” (F2) key to decrease the set temperature.
 - Press “◀” (F3) key to select the range of set temperature.
- Insert the sensors (UUT), which are going to be calibrated into the corresponding hole of the inserts.
- Allow the bath to stabilize at the set temperature.
- Connect test probe (UUT) to the indicator and note down the readings of test probe and same steps can be followed for other set of calibration points.
- After calibration is over, set the bath temperature to ambient and allow it to cool.
- After reaching the ambient temperature, switch off the power supply.

Switch Test

- Connect the output of thermostat switch to the switch test sockets using the test probes supplied.
- If the thermostat switch is “Normally Closed”, the LED indication will glow and will stop glowing when the switch changes its state.
- If the thermostat switch is “Normally Open”, the LED will not glow initially and will glow when the switch changes its state.

8. TROUBLESHOOTING / MAINTENANCE

Replace the main fuse by following the below instructions:

- Identify the main fuse in the fuse box in the socket.
- Open the lid of the fuse box using a screwdriver.
- Replace the fuse with the main fuse rating 6.3A (12A for 115V).

Replace the Heater fuse by following the below instructions:

- Identify the heater fuse in the corresponding fuse holders marked in the enclosure of the equipment.
- Open the fuse holder in anti-clockwise direction.
- Replace the fuse with the heater fuse rating as 6.3A (12A for 115V)

Maintenance:

Clean the instrument by following the below instructions.

- Before cleaning the calibrator, you must switch it off, allow it to cool down to ambient and remove the power cord.
- Users should / must carry out the following cleaning procedures as and when required.

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.

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.

Adjusting and calibrating the instrument

You are advised to return the calibrator to Nagman, Chennai - INDIA or to an accredited laboratory at least once a year for calibration.

Returning the calibrator for Service

When returning the calibrator to the manufacturer for service, please provide complete information about the problems faced for clear analysis of the problem. The calibrator should be returned in the original packing.

Nagman's liability ceases if :

- Parts are replaced / repaired using spare parts which are not identical to those recommended by the manufacturer.

Nagman's liability is restricted to errors that originated from the factory.

For more details, write to :

NAGMAN INSTRUMENTS AND ELECTRONICS PRIVATE LIMITED

170/1a2, Chennai Bangalore Highway Road,
Sembarambakkam, Chennai - 600 123. INDIA.

Phone: +91-44-66777000, 011, 022, 033

Email: support@nagman.com.

Website : www.nagman.com