Boekel Scientific

TTT Digital Incubator

135000
135000-2

Operating Instructions

Table of Contents

1.0 Safety

The following symbols marked on the equipment mean:

Caution: Read these operating instructions fully before use and pay particular attention to sections containing this symbol.

Attention: Suivre attentivement les instructions avant l'usage et prêtez une attention particulière aux sections comportant ce symbole.

Caution: Surfaces can become hot during use.

Attention: Les surfaces peuvent devenir brûlantes pendant l'usage.

Always observe the following safety precautions.

- Read this entire manual before using the incubator.
- Use only approved accessories. Do not modify system or components. Any alterations or modifications to your incubator may be dangerous and will void the warranty.

- Use only as specified by the operating instructions or the intrinsic protection may be impaired. After transport or storage in humid conditions, dry out the unit for 48 hours before connecting it to the supply voltage. During drying out the intrinsic protection may be impaired.
- Connect only to a power supply that provides a safety ground terminal.
- Do not check temperature by touch. Use the temperature display or a thermometer.
- Do not touch surfaces that become hot.
- Ensure that the power supply cord plug is easily accessible during use.
- Do not block or restrict ventilation slots. Allow at least 3" clearance around the entire unit.
- If liquid is spilled inside the unit, disconnect it from the power supply and have it checked by a competent person.
- This product must be used with a power supply cord that is rated for a minimum temperature of 90 degrees C and that complies with National and Local certification requirements.
- Do not use with flammable, corrosive or hazardous material. Never leave the unit unattended.
- Do not mount equipment on a surface of flammable material due to a hazard that could be caused by hot items falling from the equipment when the door is opened.

2.0 Intended Use of Product

The Boekel Scientific TTT Incubator is designed for use where the preparation or testing of materials is done at approximately atmospheric pressure and no flammable, volatile or combustible materials are being heated. All chemicals intended to be treated/prepared must be in sealed, heat-resistant containers.

3.0 Installation

3.1 Unpacking the Unit

Remove the packing materials carefully, and retain for future shipment or storage of the unit. Inspect for damage. Report all shipping damage to the carrier immediately. Shipping damage is covered by the carrier and repair/replacement for shipping damages must be coordinated through the carrier. Complete and return the Warranty Registration Card or you may also complete this Warranty Card online at www.boekelsci.com.

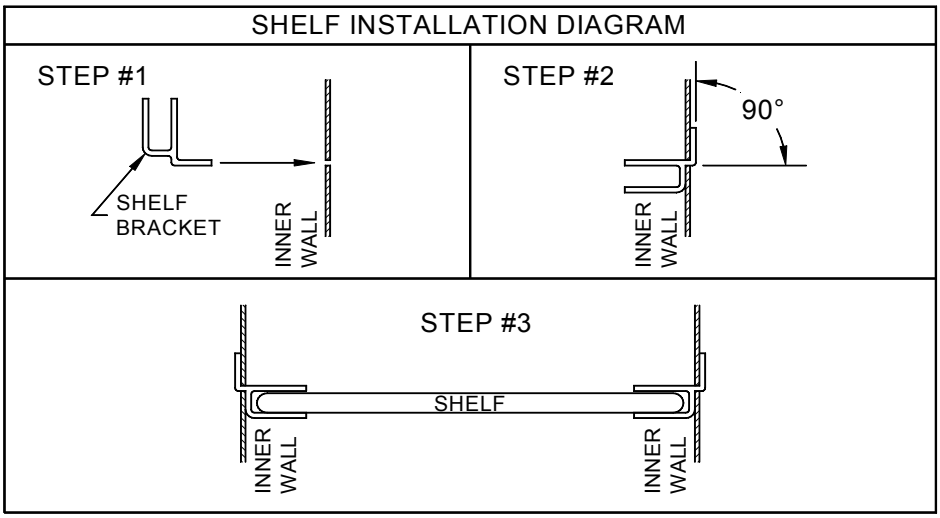
The package should contain:

- Incubator
- Power line cord
- Operating Instructions
- One wire shelf and mounting brackets.

3.2 Set up

Place the incubator on a flat and stable surface, preferably away from drafts with at least 3" clearance around unit. Ensure that the surface on which the unit is placed will withstand the radiated heat produced by typical laboratory incubators. Fit the power line cord into the IEC power socket on the rear of the unit. Plug the power cord into a power supply that matches the voltage listed on the serial/electrical information label on the rear of the unit.

Insert the Shelf at the desired heights. Refer to the sketch below for proper shelf mounting bracket installation.



4.0 Control Panel Overview

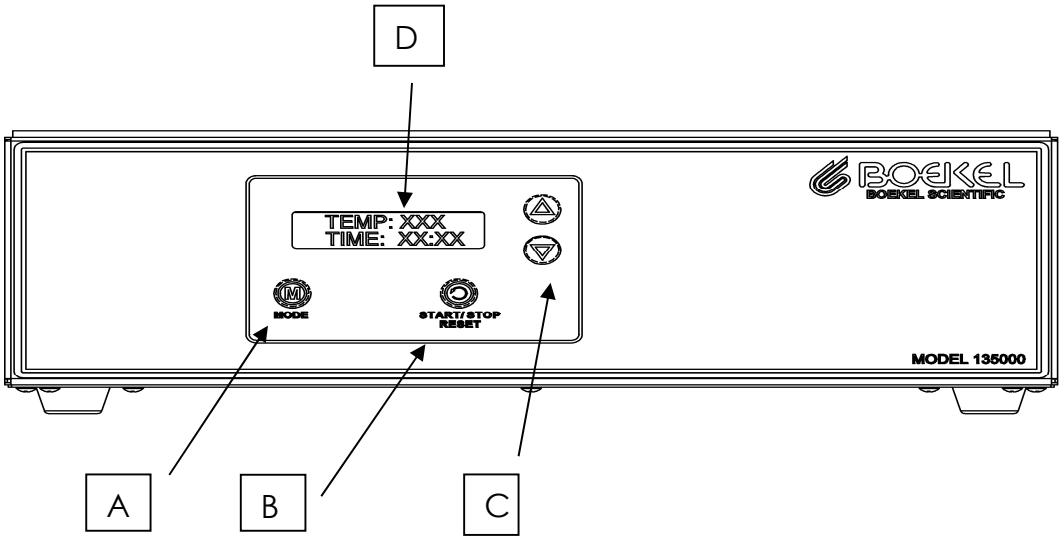
A. Mode Key – Toggles between temperature set-point adjustment mode and timer adjustment mode.

B. Start/Stop/Reset – Starts, stops, and resets the timer. Single press of the button will start, stop, or resume the timer. Pressing and holding until an audible tone is heard will reset the timer to the last entered setting. The timer does not control temperature nor does it turn the heater off.

C. Up/Down Arrow Keys – Used to increase or decrease the temperature set point and timer setting.

D. LCD Display – Top line is always the actual chamber temperature reading. The bottom line displays the adjustable set point temperature when in the temperature set-point mode, and the adjustable timer value when in the timer mode.

E. When the unit is in full heat mode, a white square on the far right of the lower display line will illuminate. When the heater is cycling the white square will flash. When the heater is off, the while square is no longer illuminated.



5.0 Operation

5.1 Turning The Unit On

5.1.1 Using the power cord provided with the unit, connect the female end directly into AC socket on rear of unit. Make sure power switch on rear of unit is off (0). Connect male end of power cord to grounded electrical outlet.

5.1.2 Turn unit on by switching the power switch to the on position (I). The unit will go through a brief startup test, which includes displaying the software revision level.

5.1.3 After the start up test is completed, the unit will switch to normal operation mode. The LCD display will show the Actual Temperature of the chamber as well as the Set-point value.

5.2 Mode Key

5.2.1 When the unit powers up it defaults to the Temperature Mode, which is indicated on the LCD display by showing the Actual Temperature on the top line and the Temperature Set-point on the bottom line. The

setpoint colon (:) will be flashing which indicates the Temperature Set-point is adjustable.

5.2.2 When the Mode Key is depressed, the LCD display changes to the Timer Set Mode. This is indicated on the LCD display by showing the Actual Temperature on the top line and the Timer value on the bottom line. The Timer colon (:) will be flashing which indicates that the Timer value is adjustable.

5.3 Setting Temperature

5.3.1 Depress the Mode Key to enter Temperature mode as indicated in step 5.2.1.

5.3.2 Using the Up/Down arrow keys, adjust the Set-point to the desired chamber temperature.

5.3.3 Allow at least 30 minutes for the unit to stabilize when making a temperature change.

5.4 Setting The Timer

5.4.1 Depress the Mode Key to enter Timer mode as indicated in step 5.2.2.

5.4.2 Using the Up/Down arrow keys, adjust the Timer to the desired time. Time is indicated in minutes and seconds (mm:ss) and the maximum timer setting is 999 minutes and 99 seconds. When adjusting the Time value, there is a speed up algorithm in the software which accelerates the setting speed.

5.4.3 Depress the Start/Stop/Reset Key to begin the timer count down. When the timer reaches 00:00, the unit will beep 3 times and the display will alternate between "Cycle Complete", and the Temperature/Timer display.

5.4.4 By depressing and holding the Start/Stop/Reset key for 3 seconds, the timer will reset back to its previous timer setting.

5.4.5 If the Start/Stop/Reset key is depressed during the timer countdown, a "Timer Paused" message will be

displayed. By pressing the Start/Stop/Reset key the LCD display will switch again and will restart the timer.

5.5 Over-Temperature Alarm

5.5.1 The unit is equipped with an Over-Temperature Alarm that is activated when the chamber temperature exceeds the Temperature Set Point by more than 5.0°C. When an alarm occurs, the display will alternate between "High Temp Alarm" and the actual chamber temperature. An audible tone will also be heard. The alarm cannot be deactivated until the chamber temperature is within 5.0°C of set point.

5.5.2 The Over-Temperature Alarm is factory preset to activate when chamber temperature is more 5.0°C above temperature Set Point. However, this can be adjusted higher or lower by the user. To adjust the Over- Temperature Alarm setting, turn the unit off and depress both Up/Down Arrow keys simultaneously while turning the unit back on. The LCD should display "Deviation Alarm" setting. Using the Up/Down Arrow keys, adjust the Over-Temperature Alarm setting to the desired temperature. Press the Start/Stop key to return unit to normal operating mode and save the setting. Powering unit off the on resets the Over-Temperature Alarm to 5.0°C.

5.5.3 The unit is also equipped with a non-self-resetting thermostat that cuts power to the machine in case the unit finds itself in a run-a-way condition. This switch is located on the thermostat behind the back panel located to the right of the fan. To re-set this switch you will need to remove all screws from the pack panel. But first you must give the unit ample time to cool down. This can be expedited by opening the front door of the unit.

Ensure there in no power going to the machine. Place the on/off switch in the off position. Remove the power supply cord from the wall outlet and from the unit's receptacle.

Remove the back panel and locate the thermostat reset switch and de-press the switch one time to reset the thermostat.

Replace the back panel with all the screws and plug the power supply cord back into the receptacle.

Place the on/off switch in the on position and the unit should return to normal operating function.

6.0 Calibration

6.1 Place a certified reference thermometer in the center of the chamber. Ensure the thermometer is not touching any shelving.

6.2 From a cold start, turn the unit on and set the temperature Set Point to 30.0°C. Allow the unit to stabilize for at least 45 minutes.

6.3 After the unit stabilizes, turn the unit off. Depress and hold both the Up/Down arrow keys simultaneously and turn unit back on. Depress the Mode key once, so the LCD display shows "zero adj". It will also display the Actual chamber temperature.

6.4 Subtract the LCD display Actual Temperature from the reference thermometer temperature reading and use this value as your zero adjust. Once you have determined your zero adjust, use Up/Down arrow key to enter this value. If the zero adjust value is negative, use the Down arrow key, if it is positive use the Up arrow key.

6.5 Wait 10 seconds after making the zero adjustment and the turn the unit off. Turn the unit back on and set the temperature Set Point to 65°C. Allow the unit to stabilize for at least 45 minutes.

6.5 After the unit stabilizes, turn the unit off. Depress and hold both the Up/Down arrow keys simultaneously and turn unit back on. Depress the Mode key twice so the LCD display shows "span adj. It will also display the

Actual chamber temperature. Allow the unit to restabilize for at least 15 minutes.

6.4 Subtract the LCD display Actual temperature from the reference thermometer temperature reading and use this value as your span adjust. Once you have determined your span adjust, use the Up/Down arrow key to enter this value. If the span adjust value is negative use the Down arrow key, if it is positive use the Up arrow key.

7.0 Technical Specifications

This equipment is for indoor use and will meet its performance specifications within the ambient temperature range of 10°C to 30°C, with maximum relative humidity of 80%... Installation category II (transient voltages). Pollution degree 2 in accordance with IEC 664. For operation at altitudes of up to 6500 feet (2000 meters).

Temperature Range	Ambient +8.0°C to 70°C
Stability	±0.2°C
Uniformity	±0.5°C at 37°C
Temperature Display Resolution (Digital Only)	0.1°C
Supply Ratings Model # 135000 Model # 135000-2	 115 V AC; 50/60 Hz; 2.1 Amps 230 V AC; 50/60 Hz; 1.1 Amps
Heating Rate	Ambient to 70°C in 10 minutes
Overall Dimensions (W x D x H)	14.0" x12.5" x 12.5"
Chamber Dimensions (W x D x H)	12.0" x 8.0" x 6.0"
Mains fluctuate	+/- 10 %

8.0 Additional Accessories Available for Purchase

Item #	Description
C1905925	Wire Shelf
908-0005	Thermometer

9.0 Fault Diagnosis

Symptom	Possible Cause	Action Required
Unit does not operate	a. Unit is not switched on	a. Switch the unit on
	b. Unit is not plugged into a power supply	b. Plug in, switch on
	c. Fuses blown	c. Replace fuses (see section 9.2)
	d. Power supply failure	d. Check that other electrical appliances on the same circuit are working
	e. Thermostat tripped	e. Remove back panel and press re-set button on thermostat
Chamber temperature does not heat when expected	a. Actual temperature is higher than Set temperature	a. Check set temperature
	b. Temperature control circuit fault	b. Have unit checked by a competent service person
	c. Circulation Fan failure	c. Have unit checked by a competent service person
Temperature continues to rise when not expected	a. Actual temperature is lower than Set temperature	a. Check set temperature
	b. Temperature control circuit fault	b. Have unit checked by a competent service person
	c. Circulation Fan failure	c. Have unit checked by a competent service person

10.0 Maintenance and Service

All Boekel laboratory products are designed to comply with IEC61010-1. No routine maintenance is required.

10.1 Cleaning

Disengage power cord prior to cleaning. Both the inner chamber and outer housing can be cleaned with a cloth dampened with water and mild soap. Do not use spray cleaners that might leak through and damage electrical components. Do not use chlorine-based bleaches or abrasives, as they will damage the stainless steel interior. Do not immerse the incubator in water.

10.2 Over Temperature Safety Testing

The TTT Incubator has been equipped with an over-temperature thermal cutoff switch. This switch protects the unit from generating an unsafe condition should there be a component failure. It is recommended that the device be tested every six months, using the following procedure:

a. Test mode may be invoked by holding down the "Mode" & "Start/Stop/Reset" keys while switching power on.

Once in test mode the display shows:
"OVERTEMP xx.xC"
"SAFETY TEST []"
([] is the heat on indicator)

b. The unit will then heat itself in an attempt to trip the safety cutoff switch.

WARNING: The chamber will be heated to an elevated temperature. Do not touch any surfaces or leave anything inside the chamber. The door must be closed during the test

c. If the test passes, the unit powers itself off.
d. Unplug the unit and, after allowing it to cool, remove the screws fastening the upper rear panel to the housing using a Philips screwdriver. Never perform any work on the unit or remove the rear panel while the unit is plugged in.

e. On the rear wall of the chamber exterior, to the right of the fan motor (as viewed from behind), is the thermal cutoff switch. Press the button on the switch to reset it and allow for continued operation of the unit (see picture below.)

f. Re-fasten the upper rear panel to the housing, and plug the unit in to an appropriate receptacle. The unit will now be ready for normal operation once again.

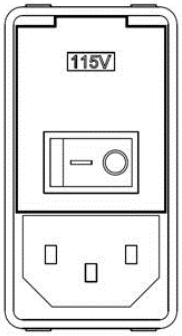
NOTE: If the unit does not pass this test, you will need to return the unit to Boekel Scientific for service. Please see 12.0 Service, for instructions on returning the unit to Boekel.

10.3 Replacement of Fuses

There are two supply fuses located in the fuse drawer. To change the fuses:

- Turn power switch to the off (O) position
- Disconnect the unit from the power supply

- Remove the line cord from the power entry module on the back of the unit (Figure 2 – below)
- Pull back on the fuse drawer catch (located on top of power entry module)
- Pull out the fuse drawer
- Check and replace with the correct fuses if necessary. The fuses must be 5mm x 20mm Quick Acting, rated at 2.5amp 250V for 115V units, and 1.25amp 250V for 230V units.
- Push the drawer back in and reconnect the unit to the power supply.
- Verify correct voltage reading is displayed in the fuse window located above the on/off switch (illustrated below) after fuse replacement before connecting to the power supply.



11.0 Warranty

When used in laboratory conditions and according to these operating instructions, Boekel warrants this product to be free of defective material and workmanship for a period of two years from the date of manufacture. The liability of Boekel for any defective equipment during the warranty period shall be limited to the repair of such equipment or replacement thereof without charge for parts or labor.

12.0 Service

It is required to obtain a Returned Material Authorization (RMA) number before any Boekel products are returned for any reason. A Decontamination Certificate must be completed, signed by the user, and returned to Boekel Scientific prior to receiving the RMA number. Please consult the manufacturer or his agent if there is any doubt about the compatibility of decontamination or cleaning agents. Please be sure to mark the outside of the returned goods package with this RMA number to ensure prompt handling.

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