



Boekel Complete Culture Control Incubators

Operating Instructions

Table of Contents

1.0	Safety	4
2.0	Product Information	5
3.0	Assembly	6
3.1	Unpacking the Unit.....	6
3.2	Installation	6
4.0	Operation	7
4.1	Analog Controls and Indicator Lamps (See Figure 1).....	7
4.2	Digital Controls and Indicator Lamps (See Figure 2).....	7
4.3	Setting the Temperature (Analog).....	7
4.4	Setting the Temperature (Digital).....	7
4.5	Operating the Incubator.....	8
5.0	Technical Specifications	8
6.0	Accessories	9
7.0	Fault Diagnosis	9
8.0	Maintenance and Service	10
8.1	Cleaning	10
8.2	Replacement of Fuses	10
9.0	Warranty	11
10.0	Service	11

Figure 1
Incubator Front Panel (Analog)

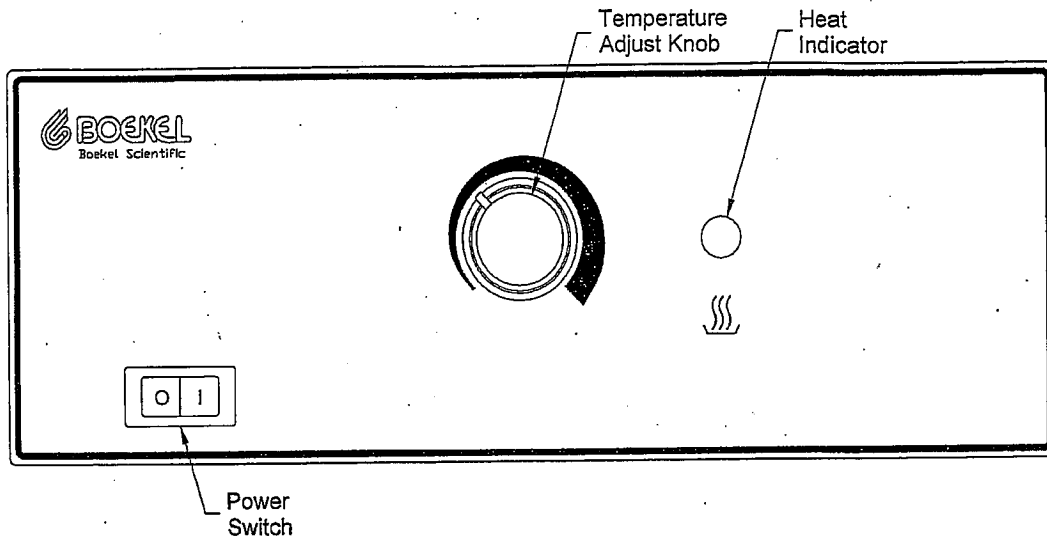
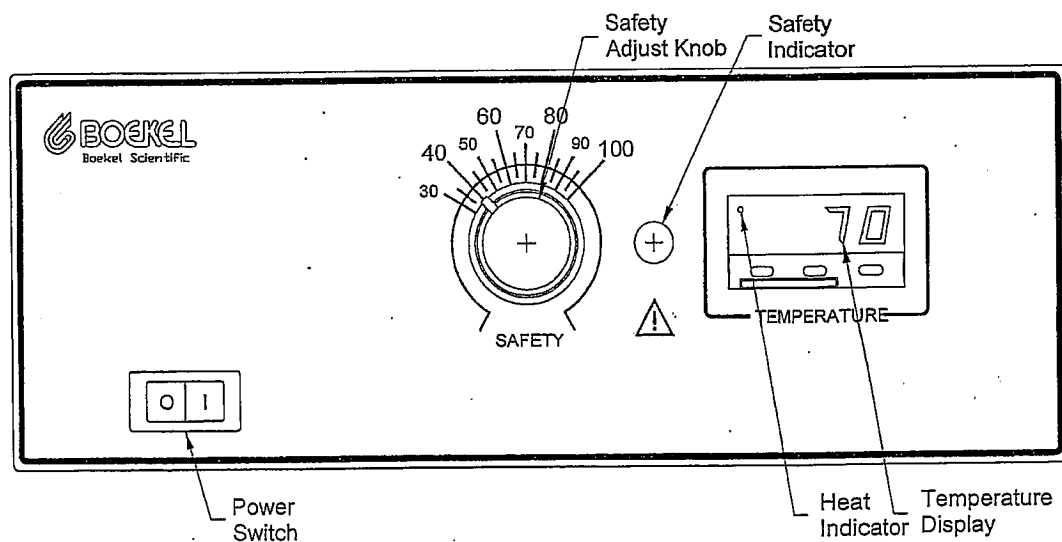


Figure 2
Incubator Front Panel (Digital)



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:

- 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 before connecting it to the supply voltage. During drying out the intrinsic protection may be impaired.
- It is recommended that the unit be located within a fume hood during use.
- Connect only to a power supply that provides a safety ground terminal.
- Before moving, disconnect at the power supply socket. Do not remove the plug.
- Do not check temperature by touch. Use the temperature display or a thermometer.
- To reduce the risk of eye injury during high temperature operation, use safety goggles or spectacles.
- Do not touch surfaces that become hot during high temperature operation.
- Ensure that the operating temperature is less than the maximum operating temperature of your sample material.
- Ensure that the power switch is easily accessible during use.
- Do not block or restrict ventilation slots.
- If liquid is spilled inside the unit, disconnect it from the power supply and have it checked by a competent person.
- It is the user's responsibility to carry out the appropriate decontamination if hazardous material is spilled on or inside the equipment.
- This product must be used with an UL / CSA Certified power supply cord set rated for a minimum temperature of 90°C.
- The responsible body shall be made aware that, if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

2.0 Product Information

The Boekel Incubators are designed for laboratories and clinics that require contemporary styling, accuracy and economy in a basic incubator package. The incubators are available with either digital or analog temperature control, with a solid door or with a see through door, and with either 115V or 230V input. Listed below are the available model numbers with the available features.

Model No.	Heating Chamber Volume	Temperature Control	Door Style	Input Voltage
138000	0.5 Cu. Ft.	Digital	Solid	115 VAC
138000-2	0.5 Cu. Ft.	Digital	Solid	230 VAC
138025	0.5 Cu. Ft.	Digital	With Window	115 VAC
138025-2	0.5 Cu. Ft.	Digital	With Window	230 VAC
138200	1.4 Cu. Ft.	Digital	Solid	115 VAC
138200-2	1.4 Cu. Ft.	Digital	Solid	230 VAC
138225	1.4 Cu. Ft.	Digital	With Window	115 VAC
138225-2	1.4 Cu. Ft.	Digital	With Window	230 VAC
139200	1.4 Cu. Ft.	Analog	Solid	115 VAC
139200-2	1.4 Cu. Ft.	Analog	Solid	230 VAC
139225	1.4 Cu. Ft.	Analog	With Window	115 VAC
139225-2	1.4 Cu. Ft.	Analog	With Window	230 VAC
138300	2.5 Cu. Ft.	Digital	Solid	115 VAC
138300-2	2.5 Cu. Ft.	Digital	Solid	230 VAC
138325	2.5 Cu. Ft.	Digital	With Window	115 VAC
138325-2	2.5 Cu. Ft.	Digital	With Window	230 VAC
139300	2.5 Cu. Ft.	Analog	Solid	115 VAC
139300-2	2.5 Cu. Ft.	Analog	Solid	230 VAC
139325	2.5 Cu. Ft.	Analog	With Window	115 VAC
139325-2	2.5 Cu. Ft.	Analog	With Window	230 VAC
138400	5.0 Cu. Ft.	Digital	Solid	115 VAC
138400-2	5.0 Cu. Ft.	Digital	Solid	230 VAC
138425	5.0 Cu. Ft.	Digital	With Window	115 VAC
138425-2	5.0 Cu. Ft.	Digital	With Window	230 VAC
139400	5.0 Cu. Ft.	Analog	Solid	115 VAC
139400-2	5.0 Cu. Ft.	Analog	Solid	230 VAC
139425	5.0 Cu. Ft.	Analog	With Window	115 VAC
139425-2	5.0 Cu. Ft.	Analog	With Window	230 VAC

3.0 Assembly

3.1 Unpacking the Unit

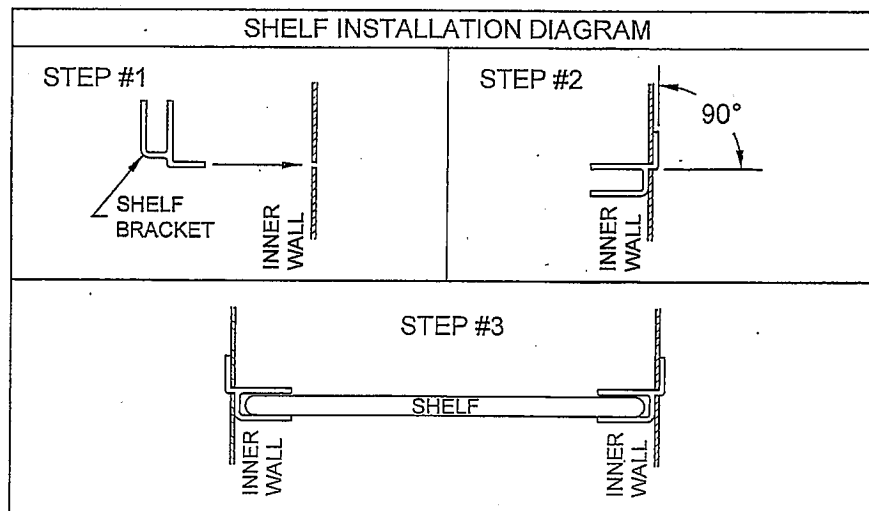
Remove the packing materials carefully, and retain for future shipment or storage of the unit. Inspect for damage. Report all shipping damage to the carrier immediately. Shipping damage is covered by the carrier and repair/replacement for shipping damages must be coordinated through the carrier. Complete and return the Warranty Registration Card. Packages should contain:

- Incubator
- Power line cord
- Operating Instructions
- Shelves and Shelf Mounting Brackets
 - 0.5 Cu. Ft. – 1 Shelf with 4 Shelf Brackets
 - 1.4 Cu. Ft. – 2 Shelves with 8 Shelf Brackets
 - 2.5 Cu. Ft. – 2 Shelves with 8 Shelf Brackets
 - 5.0 Cu. Ft. – 3 Shelves with 12 Shelf Brackets
- Timer

3.2 Installation

Place the incubator on a flat and stable surface, preferably away from drafts. Insure 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 Shelves at the desired heights. Refer to the sketch below for proper shelf mounting bracket installation.



4.0 Operation

4.1 Analog Controls and Indicator Lamps (See Figure 1)

The **Power Switch** controls power to the unit.

The **Temperature Adjust Knob** is used to increase or decrease the chamber temperature.

The **Heat Indicator** is on continuously while the oven is heating up. As the required temperature is approached, it starts to flash. When the unit is controlling at the set temperature, the heater lamp flashes intermittently.

The **Timer** is used to set a specific incubation time. At the end of the set time the timer will alert the operator that the timed cycle is over.

4.2 Digital Controls and Indicator Lamps (See Figure 2)

The **Power Switch** controls power to the unit.

The **Safety Adjust Knob** is used to set the safety thermostat. The safety thermostat should be set to approximately 10°C above the set temperature.

The **Temperature Display** shows either the set temperature or the chamber temperature during normal operation.

The **Safety Indicator** is illuminated when the chamber temperature is greater than the setting of the safety thermostat. When the safety indicator is illuminated check that the safety thermostat is set approximately 10°C above the set temperature.

The **Timer** is used to set a specific incubation time. At the end of the set time the timer will alert the operator that the timed cycle is over.

4.3 Setting the Temperature (Analog)

Use the temperature adjust knob to set the desired temperature. The knob is rotated clockwise to increase the chamber temperature and counter clockwise to decrease the chamber temperature. If the temperature adjust knob is not moved when the incubator is power down, the incubator will return to its previously set temperature upon restart.

4.4 Setting the Temperature (Digital)

The temperature controller has three buttons. When the button on the left, '*', is depressed, the set temperature is displayed. When the left button '*' is depressed simultaneously with the middle button '▼', the set temperature value is lowered. When the left button '*' is depressed simultaneously with the right button '▲', the set temperature value is raised. When all buttons are released, the actual chamber temperature is displayed. In the event of a power loss, the temperature controller retains the last set temperature value.

To protect both the unit and your samples, the safety cutout should be set each time the operating temperature is changed. Set the adjustable safety cutout knob approximately 5°C to 10°C above the set point.

4.5 Operating the Incubator

To turn the incubator on, switch the power switch to the on (I) position. Set the desired chamber temperature. The heater lamp will illuminate and remain lit until the chamber temperature reaches the set temperature. After reaching the set temperature, the heater lamp will cycle on and off with the heater operation. Allow a 60 minute chamber temperature equilibration when starting the incubator from a cold start. Allow at least 15 to 30 minutes for re-equilibration when changing temperatures. To turn the incubator off, switch the power switch to the off (O) position.

5.0 Technical Specifications

This equipment is for indoor use and will meet its performance figures within the ambient temperature range of 5°C to 40°C, with maximum relative humidity of 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C. 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	0.5, 1.4, 2.5 & 5.0 Cu. Ft. Incubators – Ambient + 10°C to 90°C
Stability	Digital $\pm 0.5^{\circ}\text{C}$ at 37°C Analog $\pm 1^{\circ}\text{C}$ at 37°C
Uniformity	Digital $\pm 0.7^{\circ}\text{C}$ at 37°C Analog $\pm 1.5^{\circ}\text{C}$ at 37°C
Temperature Display Resolution (Digital Only)	0.1°C
Supply Ratings	0.5 Cu. Ft.: 115 VAC, 240 W, 60 Hz 0.5 Cu. Ft.: 230 VAC, 240 W, 50 Hz 1.4 Cu. Ft.: 115 VAC, 240 W, 60 Hz 1.4 Cu. Ft.: 230 VAC, 240 W, 50 Hz 2.5 Cu. Ft.: 115 VAC, 750 W, 60 Hz 2.5 Cu. Ft.: 230 VAC, 290 W, 50 Hz 5.0 Cu. Ft.: 115 VAC, 1475 W, 60 Hz 5.0 Cu. Ft.: 230 VAC, 555 W, 50 Hz
Heating Rate	Ambient to 65°C in 15 minutes
Auxiliary Outlet in Chamber 1 Outlet on 2.5 Cu. Ft. (115V only) 2 Outlets on 5.0 Cu. Ft. (115V only)	4.0 A Maximum, 115V, 60 Hz, 1.5 mA leakage current

6.0 Accessories

Model Number	Description
Removable Shelves	
C1904815	Shelf for 0.5 Cu. Ft. Incubator
C1904816	Shelf for 1.4 Cu. Ft. Incubator
C1904817	Shelf for 2.5 Cu. Ft. Incubator
C1904817	Shelf for 5.0 Cu. Ft. Incubator
A1903208	Shelf Mounting Bracket
908-0005	Thermometer

7.0 Fault Diagnosis

Symptom	Possible Cause	Action Required
Unit does not operate	<ul style="list-style-type: none"> a. Unit not switched on b. Unit not plugged into power supply c. Fuses blown d. Power supply failure 	<ul style="list-style-type: none"> a. Switch on b. Plug in, switch on c. Replace fuses (see section 8.2) d. Check that other electrical appliances on the same circuit are working
Chamber temperature does not rise when expected	<ul style="list-style-type: none"> a. Actual temperature is higher than set temperature b. Temperature control circuit fault c. Circulation Fan failure d. Safety thermostat set too low. 	<ul style="list-style-type: none"> a. Check set temperature b. Have unit checked by a competent service person c. Have unit checked by a competent service person d. Set safety thermostat approximately 10°C above set temperature.
Temperature continues to rise when not expected	<ul style="list-style-type: none"> a. Actual temperature is lower than set temperature b. Temperature control circuit fault c. Circulation Fan failure 	<ul style="list-style-type: none"> a. Check set temperature b. Have unit checked by a competent service person c. Have unit checked by a competent service person

8.0 Maintenance and Service

All Boekel laboratory products are designed to comply with IEC1010-1. No routine maintenance is required.

8.1 Cleaning

Disengage power cord prior to cleaning. If a spill occurs, use appropriate clean-up procedures as required for radiation or biohazard control. The outer casing can be cleaned with a cloth dampened with water. Do not immerse the incubator in water.

8.2 Replacement of Fuses (all models except 115 V 5.0 Cu. Ft.)

Caution – Double pole / Neutral Fusing

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
- Pull back on the fuse drawer catch
- Pull out the fuse drawer (See Figure 2)
- Check and replace with the correct fuses if necessary. The fuses must be 5mm x 20mm quick acting, rated at 250V.

0.5 Cu. Ft. (115VAC)	2.5AF
0.5 Cu. Ft. (230VAC)	1.25AF
1.4 Cu. Ft. (115VAC)	2.5AF
1.4 Cu. Ft. (230VAC)	1.25AF
2.5 Cu. Ft. (115VAC)	2.5AF
2.5 Cu. Ft. (230VAC)	1.25
5.0 Cu. Ft. (230VAC)	3.15AF

- Push the fuse drawer back in. Reconnect unit to power supply.

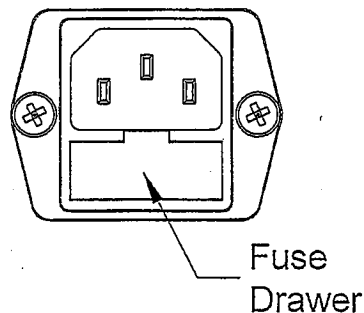
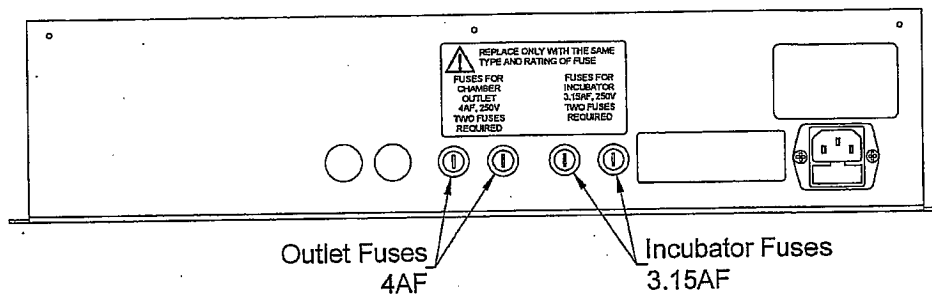


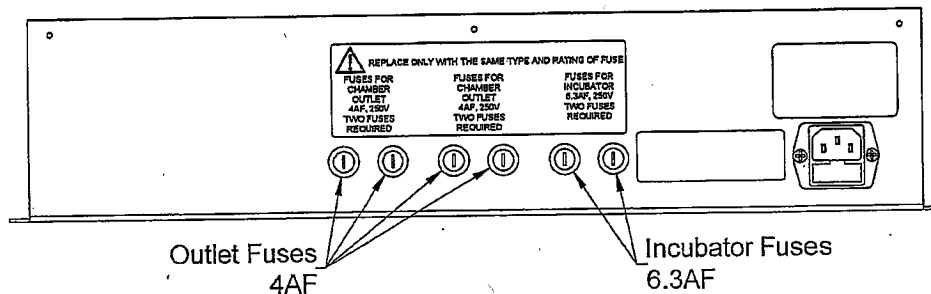
Figure 2

On the 115V 2.5 Cu. Ft. and the 5.0 Cu. Ft. sizes there are additional fuses located on the rear of the incubator. Refer to the sketches below for the fuse information. The replacement fuses must be 5mm x 20mm quick acting, rated at 250V. Before replacing any of these fuses turn the power switch to the off (O) position and disconnect the unit from the power supply. Use a flat blade screw driver to remove the fuse carrier. Replace the fuse with the value listed and replace the fuse carrier.

2.5 Cu. Ft. Incubator Rear Panel



5.0 Cu. Ft. Incubator Rear Panel



9.0 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.

10.0 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 be sure to mark the outside of the returned goods package with this RMA number to ensure prompt handling.

Boekel Scientific
855 Pennsylvania Boulevard
Feasterville, PA 19053
Phone: (215) 396-8200 or (800) 336-6929
Fax: (215) 396-8264
e-mail: boekel-info@boekelsci.com