



## **Digital Oven Series**

**151050  
151050-2  
151140  
151140-2  
151250  
151250-2  
151500  
151500-2**

## **Operating Instructions**

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## 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 oven.
- Use only approved accessories. Do not modify system or components. Any alterations or modifications to your oven 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 Digital Oven 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 the Warranty Registration Card at [www.boekelsci.com](http://www.boekelsci.com).

The package should contain:

- Oven
- Power line cord
- Operating Instructions
- Wire shelf/shelves and mounting brackets.

The following guidance illustrates how to perform a basic lift safely, using both hands, lifting a load in front of and close to your body, without twisting. These principles can be adapted to suit the actual task (from [hse.gov.uk](http://hse.gov.uk)).

- **Think before handling/lifting.** Plan the lift/handling activity. Where is the load going to be placed? Use suitable handling aids where possible. Will you need help with the load? Remove obstructions, like discarded wrapping materials. For long lifts, for example from floor to shoulder height, think about resting the load mid-way on a table or bench to change grip.
- **Keep the load close to your waist** for as long as possible while lifting. Keep the heaviest side of the load next to your body. If you can't get close to the load, try to slide it towards your body before you try to lift it.
- **Adopt a stable position.** Your feet should be apart with one leg in front of the other (alongside the load if it is on the ground) to increase stability. You should be prepared to move your feet

during the lift to keep a stable posture. Wearing overtight clothing or unsuitable footwear may make this difficult.

- **Ensure a good hold on the load.** Where possible, hug the load as close as possible to your body. This may be better than gripping it tightly with just your hands.
- **Slight bending of your back, hips and knees** at the start of the lift is preferable to either fully flexing your back (stooping) or fully flexing your hips and knees (full/deep squatting).
- **Don't flex your back any further while lifting.** This can happen if your legs begin to straighten before you start to raise the load.
- **Avoid twisting your back or leaning sideways** especially while your back is bent. Keep your shoulders level and facing in the same direction as your hips. Turning by moving your feet is better than twisting and lifting at the same time.
- **Keep your head up when handling.** Look ahead not down at the load once it is held securely.
- **Move smoothly.** Do not jerk or snatch the load as this can make it harder to keep control and can increase the risk of injury.
- **Don't lift or handle more than you can easily manage.** There is a difference between what people are able to lift and what they can safely lift. If in doubt, seek advice or get help.
- **Put down, then adjust.** If you need to precisely position the load, put it down first, then slide it into the desired position.

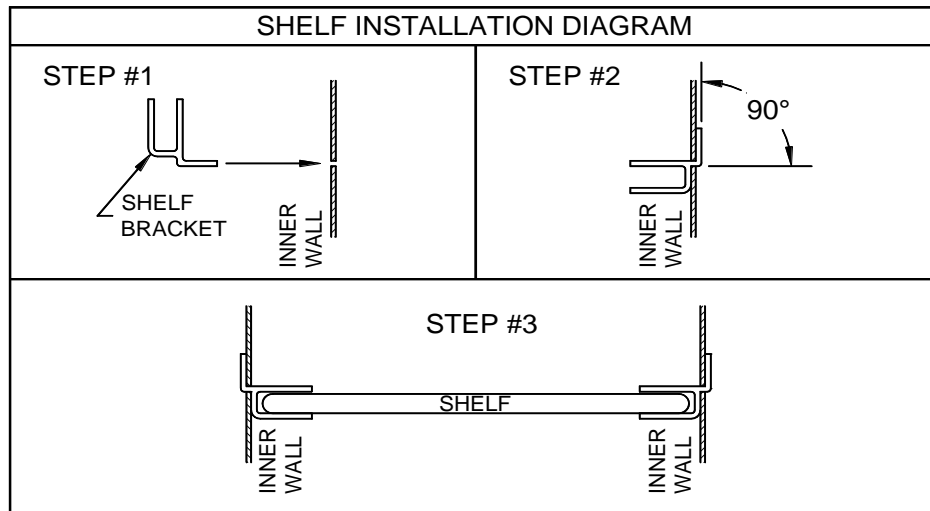
### 3.2 Setup

Place the oven 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 ovens. 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/shelves at the desired height(s). Refer to the sketch below for proper shelf mounting bracket installation.

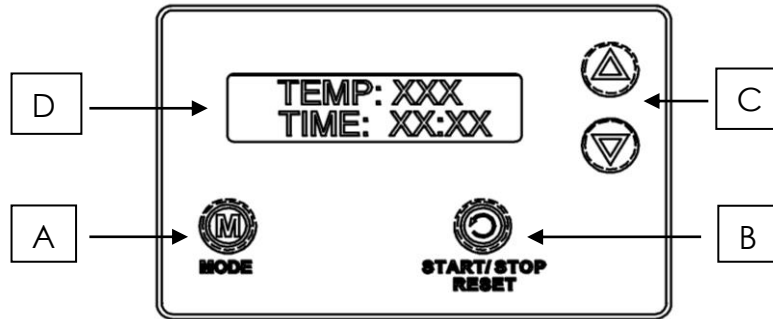
### 3.3 Door Panel

The oven is equipped with an opaque panel for optional use when the contents of the chamber need to be shielded from exposure to light. The panel can be easily installed or removed from inside the door without the use of tools. Simply align the keyholes on the panel with the hardware inside the door and slide down vertically into place. To remove, lift the panel upward and pull away.



#### 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 will illuminate on the far right of the lower display line. When the heater is cycling the white square will flash. When the heater is off, the white square will no longer be 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 the 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. **The unit will immediately begin to heat towards achieving setpoint temperature without user intervention.**

### 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 pressed, 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 Press 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 at setpoint when making a temperature change.

### **5.4 Setting the Timer**

- 5.4.1 Press 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 if the Up or Down button is held.
- 5.4.3 Press 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 pressing 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 pressed during the timer countdown, a "Timer Paused" message will be displayed. By pressing the Start/Stop/Reset key the LCD display will resume 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 Press 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.

## 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. Press and hold both the Up/Down arrow keys simultaneously and turn unit back on. Press 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 the zero adjust. Once zero adjust is determined, 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 then turn the unit off. Turn the unit back on and set the temperature setpoint to 65°C. Allow the unit to stabilize at 65°C for at least 45 minutes.
- 6.5 After the unit stabilizes, turn the unit off. Press and hold both the Up/Down arrow keys simultaneously and turn unit back on. Press 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 the span adjust. Once span adjust is determined, 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 figures within the ambient temperature range of 5°C to 30°C, with maximum relative humidity of 80% non-condensing. For operation at altitudes of up to 6500 feet (2000 meters). Degree of Ingress Protection IPX0. Pollution degree 2 in accordance with IEC 664. Overvoltage category II.

	151050	151050-2	151140	151140-2	151250	151250-2	151500	151500-2
<b>Temperature Control Range [°C]</b>	(Ambient + 8) to 70							
<b>Temperature Stability [°C]</b>	±0.2							
<b>Temperature Uniformity at 37°C [°C]</b>	1.0							
<b>Temperature Display Resolution [°C]</b>	0.1							
<b>Electrical Supply</b>								
<b>Voltage [VAC]</b>	115	230	115	230	115	230	115	230
<b>Frequency [Hz]</b>	50/60							
<b>Power Required [W]</b>	250		500		550		1050	
<b>Auxiliary Outlet</b>								
<b>Quantity</b>	0		1		2			
<b>Maximum supply, each [A]</b>	0	2	1	2	1	2	1	
<b>Timer Resolution [sec]</b>	1							
<b>Number of Shelves</b>	1		2		3		3	
<b>Max load per shelf – lb[kg]</b>	10 [4.5]							
<b>Net weight – lb[kg]</b>	27 [12.3]		40 [18.2]		55 [25.0]		81 [36.8]	
<b>Chamber Dimensions W x D x H – inch[mm]</b>	9½ x 9¾ x 9½ [241 x 248 x 241]		13½ x 13½ x 13½ [343 x 343 x 343]		17 x 17 x 15 [432 x 432 x 381]		17 x 17 x 30 [432 x 432 x 762]	
<b>Nominal Chamber Volume - ft³</b>	0.5		1.4		2.5		5.0	
<b>External Dimensions W x D x H – inch[mm]</b>	11¾ x 15¼ x 16½ [288 x 387 x 413]		16 x 19 x 20½ [406 x 483 x 514]		19½ x 22¾ x 21¾ [495 x 578 x 552]		19½ x 22¾ x 37 [495 x 578 x 940]	

## 8.0 Fault Diagnosis

Symptom	Possible Cause	Action Required
Unit does not operate	<ul style="list-style-type: none"> <li>a. Unit is not switched on</li> <li>b. Unit is not plugged into a power supply</li> <li>c. Fuses blown</li> <li>d. Power supply failure</li> </ul>	<ul style="list-style-type: none"> <li>a. Switch the unit on</li> <li>b. Plug in, switch on</li> <li>c. Replace fuses (see section 9.2)</li> <li>d. Check that other electrical appliances on the same circuit are working</li> </ul>
Chamber temperature does not heat when expected	<ul style="list-style-type: none"> <li>a. Actual temperature is higher than Set temperature</li> <li>b. Temperature control circuit fault</li> <li>c. Circulation Fan failure</li> </ul>	<ul style="list-style-type: none"> <li>a. Check set temperature</li> <li>b. Have unit checked by a competent service person</li> <li>c. Have unit checked by a competent service person</li> </ul>
Temperature continues to rise when not expected	<ul style="list-style-type: none"> <li>a. Actual temperature is lower than Set temperature</li> <li>b. Temperature control circuit fault</li> <li>c. Circulation Fan failure</li> </ul>	<ul style="list-style-type: none"> <li>a. Check set temperature</li> <li>b. Have unit checked by a competent service person</li> <li>c. Have unit checked by a competent service person</li> </ul>

## 9.0 Maintenance and Service

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

### 9.1 Cleaning

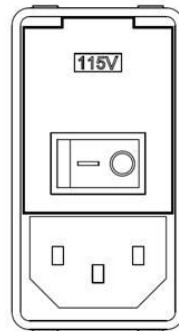
Disengage power cord prior to cleaning. Both the inner chamber and outer housing can be cleaned with a cloth dampened with water and mild soap. Do not use spray cleaners that might leak through and damage electrical components. Do not use chlorine-

based bleaches or abrasives, as they will damage the interior. Do not immerse the oven in water.

## 9.2 Replacement of Fuses

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

- Turn power switch to the off (0) position
- Disconnect the unit from the power supply
- Remove the line cord from the power entry module on the back of the unit (Figure 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 the same capacity and type as indicated on the serial label on the rear of the unit.
- Push the drawer back in and reconnect the unit to the power supply.



## 10.0 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.

## **11.0 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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