



Boekel *Bambino*TM Hybridization Oven

Models
230301 and 230301-2

Operating Instructions

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1. 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.



Caution: Surfaces can become hot during use.

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.



RISK OF TRAPPING: Do not attempt to add or remove tubes from the Carousel or adjust the clips until the motor has stopped.

Connect only to a power supply with a voltage corresponding to that on the serial number label.

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 the temperature by touch, but instead 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 appropriate decontamination if hazardous material is spilled on or inside the equipment.

2. Product Information

The Boekel Hybridization Oven Model 230301 & 230301-2 hybridization oven will hold up to four 50ml plastic centrifuge tubes. The Oven can also be used with other size tubes using the optional carousel.

The Boekel Hybridization Oven utilizes an adjustable speed Carousel and forced air circulation coupled with proportional (PID) temperature control that combine to provide unsurpassed temperature performance and the most consistent conditions from procedure to procedure. Please note that the convection fan operates continuously whenever the unit is turned on.

3. Assembly

3.1 Unpacking

Remove 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. Packs should contain:

- Hybridization Oven
- Power line cord
- Operating instructions

3.2 Installation

Place the Oven on a flat and stable surface, preferably away from drafts. Fit the power line cord into the IEC power socket on the rear of the unit.

4. Operation

4.1 Controls and Indicator lamps (see figures 1 & 2).

The Power Switch controls power to the unit.

The temperature display shows the chamber temperature in degrees Celsius.

The Speed Control knob regulates the speed of the Carousel.

The heater lamp 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.

4.2 Setting the temperature

The temperature controller has three buttons. When the button on the left ‘*’ is depressed, it will display the set temperature. 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 power loss, the Temperature Controller retains the last set temperature value.



4.3 Loading Carousel

Warning! Sharp rotating parts. Do not attempt to add or remove tubes until the motor has stopped. The motor can be stopped by turning the power switch to the "Off" position or by depressing the "Pause" button located on the back of the unit, (see figure 2). When loading the Carousel, it is recommended that the load be evenly distributed. Tubes should be positioned with sufficient clearance from the chamber wall to avoid interference from the screw heads during tube rotation.



4.4 Spindle Adjustment

If desired, it is possible to adjust the Spindle, which imparts a "rocking" or 3-D motion to get an additional washing action to the tube. The Clips have been factory set to position the tubes horizontally, but this can be adjusted by loosening the screws securing the clips, rotating them slightly, then re-tightening the screws to get the desired effect. **Warning!** Remove power from the unit before adjusting.



4.5 Removing/Installing Carousel

Warning! Remove power from the equipment before removing or installing the Carousel. To remove Carousel, first remove all tubes. Position Carousel so the socket head screw on the shaft (located on the left side of the drive shaft) is accessible, and turn power off. Loosen socket head screw with a 1/16 inch hex key and slide the carousel to the right. To install Carousel, reverse this procedure.

4.6 50ml Conical Centrifuge Tubes

Be sure to use tubes that can handle the elevated temperatures used in hybridization. We recommend that you contact your supplier or tube manufacturer. In general, scientists have found that tubes made from polypropylene with polyethylene caps provide reliable performance. Tubes made from polystyrene should be avoided.

When inserting the centrifuge tube into the clamping mechanism, place the clamp toward the middle of the tube. Pinching the tube near the cap may cause a leak.

5. Accessories

5.1 Multi-Tube Carousel

Catalog Number 230332

- 5.2 Clips for Multi-Tube Carousel (22 clips per bag)
 four clips for 50ml tubes
 six clips for 15ml tubes
 twelve clips for 1.5/2.0ml tubes
 Catalog Number 230350

6. Fault Diagnosis

Symptom	Possible Cause	Action Required
1. Unit does not operate	a. Unit not switched on b. Unit not plugged into power supply c. Fuses blown d. Power supply failure	a. Switch on b. Plug in, switch on c. Replace fuses per 8.2 d. Check that other electrical appliances on the same circuit are working
2. Chamber temperature does not rise when expected	a. Actual temperature is higher than set temperature b. Temperature control circuit fault	a. Check set temperature b. Have unit checked by competent person
3. Temperature continues to rise when not expected	a. Actual temperature is lower than set temperature b. Temperature control circuit fault	a. Check set temperature b. Have unit checked by competent person
4. No rotation, LEDs illuminated	a. An obstruction prevents Carousel rotation b. Carousel is loose	a. Remove obstruction b. Tighten set screw with hex key

7. Technical Specifications

This equipment is for indoor use and will meet its performance figures within the ambient temperature range of 10°C to 35°C, with maximum relative humidity of 80% non-condensing. Installation category II (transient voltages). Pollution degree 2 in accordance with IEC 664. For operation at altitudes of up to 6500 feet.

Temperature range	(Ambient +10°C) to 80°C.
Setting range	10°C to 80°C
Stability	+/- 0.1°C
Overall Accuracy	+/- 0.5°C at 37°C
Temperature display resolution	0.1°C
Supply voltage range	Catalog No. 230301 – 115V +/- 10%, 60 Hz. Catalog No. 230301-2 – 230V +/- 10%, 50/60 Hz.
Power Rating	Model 230301 & 230301-2 90W

Heating Rate
Speed of Rotation

Ambient to 70°C within 25 minutes
6 to 20 RPM

Note: A minimum of at least two tubes are needed for optimum temperature stability.

8. Maintenance and Service

The Model 230301 & 230301-2 Oven is 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 damp cloth. Do not submerge or immerse the Oven in water.

8.2 Replacement of Fuses

Disconnect the unit from the power supply.
Remove the plug from the socket in 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 should be 5mm x 20mm quick acting, rated 250V.

230301	(115V)	1.0AF
230301-2	(230V)	0.5AF

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

9. 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. Service

Should service be required, call Boekel Scientific Customer Service. It is required to obtain a Returned Material Authorization (RMA) number before any product is 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.

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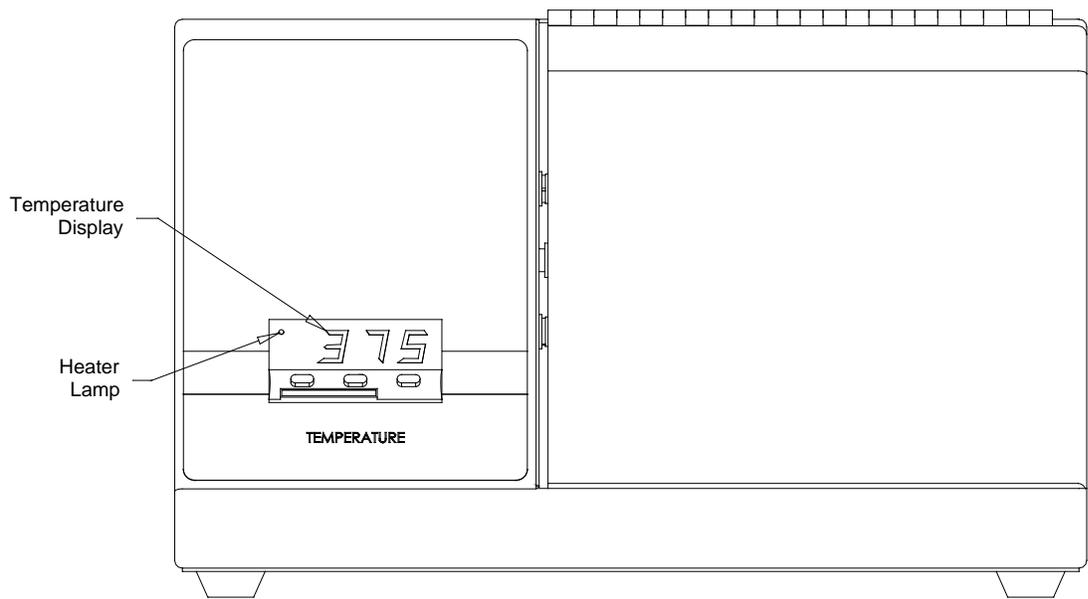


Figure 1

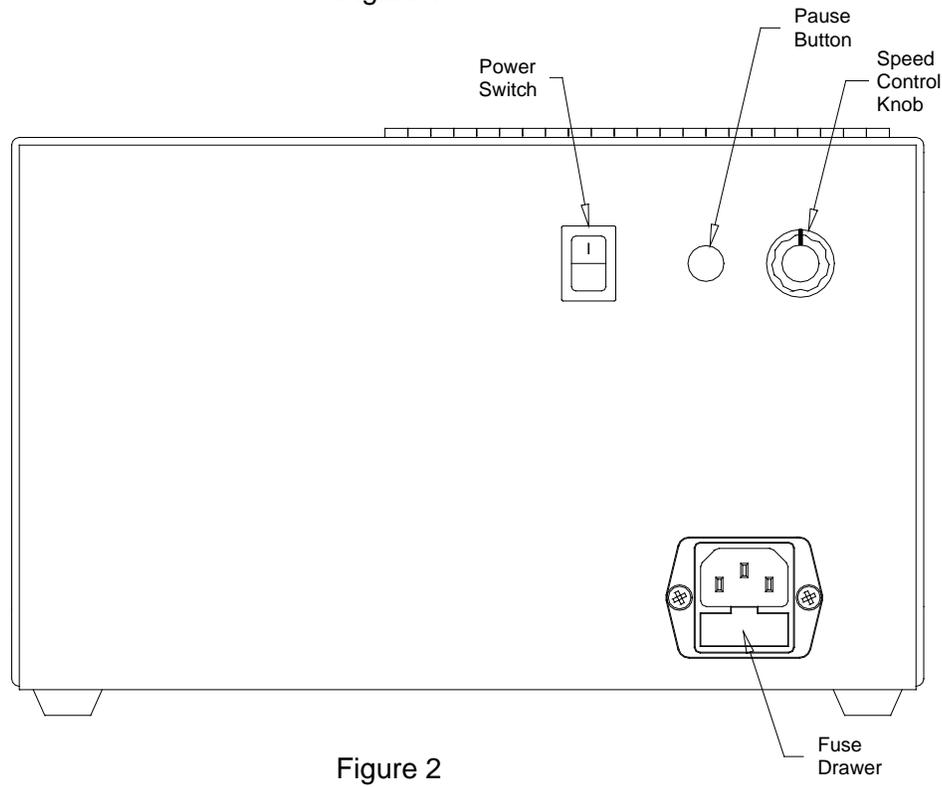


Figure 2