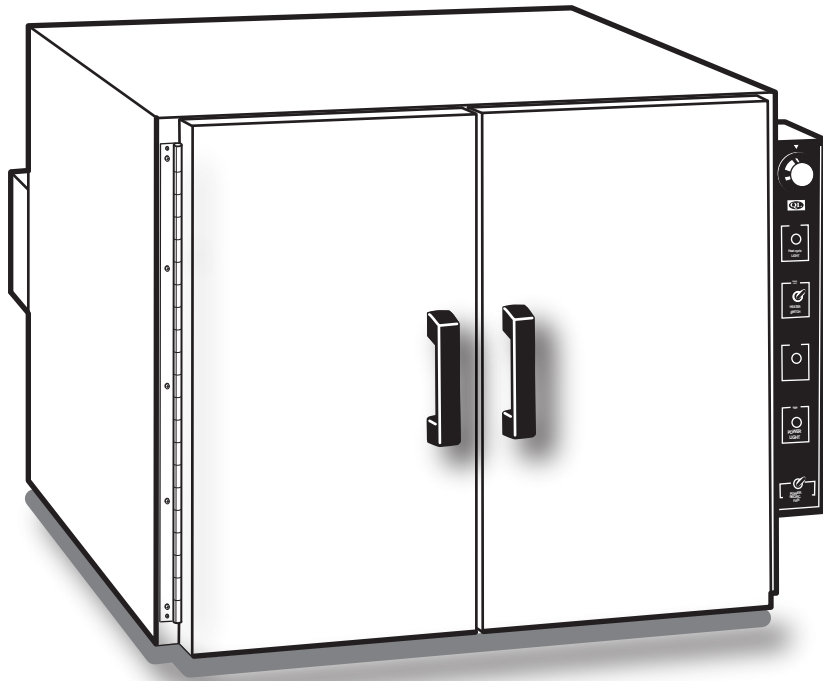


# Bench Series Ovens Operating Manual

## Models 21 /31 /51



### Standard Contents

- (1) Bench Series Oven
- (2) Adjustable nickel plated wire shelves
- (4) Shelf brackets

### Approvals:

Underwriter's UL / CUL, United States/  
Canadian for laboratory equipment.

**Compliance:** UL Standard 61010-1  
IEC 61010-1.



**NOT FOR USE WITH FLAMMABLE  
LIQUIDS OR GASES**



<u>SPECIFICATIONS</u>	MODEL 21-250	MODEL 21-350	MODEL 31-250	MODEL 31-350	MODEL 51-550
<b>INTERIOR DIMENSIONS</b> INCHES W x H x D (CM) W x H x D	25.5x19.7x24 64x49.5x60	25.5x19.7x24 64x49.5x60	25.5x29.7x24 64x75.5x60	25.5x29.7x24 64x75.5x60	25.5x19.7x22.5 64x49.5x57
<b>EXTERIOR DIMENSIONS</b> INCHES W x H x D (CM) W x H x D	33x24x35.5 83x60x90	33x24x35.5 83x60x90	33x34x35.5 83x86x90	33x34x35.5 83x86x90	33x24x35.5 83x60x90
<b>TEMPERATURE RANGE</b> Ambient + 25F to	300°F/150°C	450°F/232°C	300°F/150°C	450°F/232°C	550°F/287°C
<b>CONTROL STABILITY</b> @ 100C @ 200C	+/- 2.0°C NA	+/- 2.0°C +/- 2.5°C	+/- 2.5°C +/- 3.0°C	+/- 2.5°C +/- 3.0°C	+/- 3.0°C +/- 3.5°C
<b>STANDARD ELECTRICAL</b> VOLTS/AMPS WATTS PLUG/NEMA	120/8.75* 1050 5-15P*	120/16* 1920 5-20P*	115/8.75* 1000 5-15P*	120/16* 1920 5-20P*	230/12.5 2850 6-20P
<i>*Standard models voltage only, optional 230 voltage available by adding (-1) onto model number. Check label on back of unit.</i>					
<b>WEIGHT</b> SHIPPING STAND ALONE	185 165	185 165	225 200	225 200	195 170

### Common Unit Construction

<b>Exterior:</b>	Powder Coated Steel	<b>Interior:</b>	Aluminized Steel (SS Optional)
<b>Insulation:</b>	Rockwool Insulation	<b>Motor:</b>	Sealed Ball Bearing
<b>Thermo-control:</b>	Hydraulic Thermostat	<b>Heater:</b>	Resistive Tubular Incoloy

**IMPORTANT**

Refers to an important note in the usage of the unit

**WARNING**

Warns of a possible electrical shock

**WARNING**

Warns of a possible risk of fire

**CAUTION**

Cautions of Hot exterior surface during operation

**WARNING**

Warns of possible injury or muscle strains, use use assistance when moving or lifting.

**Safety Precautions Read Operating Instructions Thoroughly Prior to Operation****Read Operating Instructions thoroughly prior to operation and observe the following safety precautions:**

- Use only a grounded outlet that is rated for your model's electrical requirement.
- Do not modify the oven or factory control settings to operate the oven above the stated maximum operating temperature.
- Exterior surfaces on the Bench Oven models may become hot to the touch when operating at higher set temperatures.
- Do not leave the oven unattended during operation.
- Conduct periodic maintenance as required.

- WARNING:** Do not place volatile or combustible materials into Bench Ovens.
- CAUTION:** This unit is not intended for use with any flammable solvents or vapors, or with chemicals that produce toxic gases.

**Set-Up & Installation**

- Locate the oven on a suitable, clean, and solid surface.
- Maintain a minimum of 6 inches of air space between the rear electrical cover and any building or vertical surface.
- Do not cover or restrict air flow at the rear air intake ports, this will cause the motor to over-heat, shortening the motor's life and increase risk of fire.
- Heated exhaust air is expelled through the two small ports located just above rear electrical cover. (FIG. 2) Keep materials or building surfaces that may be susceptible to this heated exhaust air clear from rear area.
- Maintain a minimum 5 feet of unobstructed space above the oven to allow exhaust air to convect up and away from the air intake ports.
- Keep 3" of air space at the oven sides (3" from control panel cover). For units with optional Exhaust Chamber Adapter, see page 3.

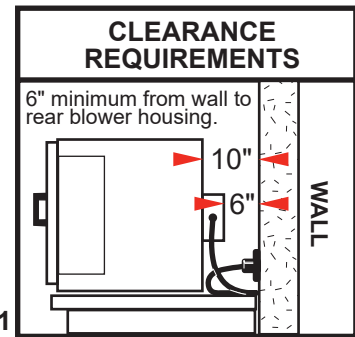


FIG. 1

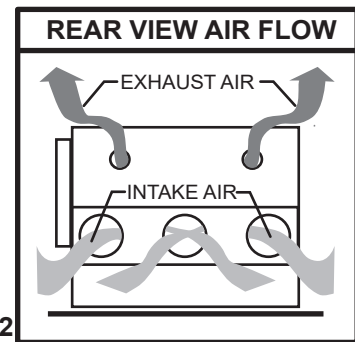


FIG. 2

**Electrical**

Plug the unit into a grounded outlet for your unit's rated voltage. Isolate each model to a separate, appropriately rated circuit or breaker.

Below are NEMA plug configurations that are supplied with the various Bench Series ovens. These configurations will also help to identify the ovens electrical rating or power requirements.

120 Volt Units		230 Volt Units	
15AMP 5-15P		15AMP 6-15P	
20AMP 5-20P		20AMP 6-20P	

See electrical label on the right rear side of electrical cover to verify your units power requirements.

## Shelf Installation and Use

Install adjustable shelf by first placing the shelf bracket rivets into the corresponding keyhole supports located on each inner side of the oven.

Orientate the bracket in the "down" or "L" position. This position guides the shelf in and out and protects the side wall from being scratched. The bracket may also be placed in the "up" or "┘" position if slightly more interior clearance is needed. Place the shelf on the brackets as shown. (FIG. 3)



FIG. 3

**⚠** Each shelf will support a distributed load of 80 lbs. maximum. Do not exceed a combined total of 300 lbs. within the oven at one time. Avoid placing articles on the oven floor. Instead, use a shelf at the lowest adjustable position.

**⚠** Care should be taken when removing articles from the oven. Don't pull the shelf out when removing heavy loads. **The shelf is not secured and loads can tip and fall forward.**

## General Operation

### NORMAL OPERATION

1. Turn the power/recirc. fan switch to the up position.
2. Turn heater switch to heat (up position).
3. Rotate the thermostat dial to the desired temperature.

The heat cycle light will illuminate until the set temperature is reached. Once reached, the heat cycle light will cycle on and off with the heaters, maintaining the set temperature.

**Typically, the oven will need to cycle at a set temperature for a minimum of 20 minutes before it will achieve equilibrium and becomes stable** (see stability specs. on page 1).

The heater switch in the off or cool position allows for convenient ambient air drying of articles or to help slowly or evenly cool heated articles without having to lower or change the temperature setting. Also, use this switch to allow the oven to cool before turning the fan off when using the oven at higher temperature settings. This helps to both cool the motor (prolonging its life), and remove moisture-laden air before it condenses in the chamber, which will help prevent premature corrosion over time.

### **⚠ OVEN'S DIAL AND TEMPERATURE ADJUSTMENT**

1. The temperatures printed on the dial are designed to help quickly set a temperature to within a close proximity of the indicated dial temperature.
2. Small rotational adjustments to the dial will likely be required to set a more precise temperature setting as measured against a reading from a glass-type or door-mounted dial thermometer (optional) or other external measurement device (insert thermometer or probe in small port hole located on the top right-front corner).
3. Any degree of offset observed for a given temperature setting may be different for other temperature settings on the dial.

The control dial is calibrated at the factory in the middle of the model's temperature range and is therefore most accurate in these middle range temperatures (some oven model's knob/dial may have printed temperature markings that are higher than the model's actual maximum range).

Over time, continuous use at a single temperature setting may require periodic re-adjustment as the contacts wear or as ambient temperatures change seasonally or from air conditioning or heating (see control calibration page 4).

## Chamber Loading and Oven Performance

When loading the oven place items in the oven in such way that air circulation within the oven is not impaired. Note the air flow from the top section view (FIG. 4). Heated air flows from back to front along the side walls, moves horizontally toward the chamber center and then back toward the recirculating blower.

Placing an article against the side walls or rear blower return vent opening will greatly affect unit performance i.e. chamber uniformity, run-up & recovery, maximum operating temperature, and energy use efficiency. Here are some guidelines that are critical to optimum oven performance and better/faster work-load processing.

### OPTIMAL CHAMBER LOADING

- Leave a space between articles on a shelf.
- For best processing performance for a single item, adjust one shelf so that the article is centered in the oven.
- Avoid placing articles on the oven floor. Instead use a shelf at the lowest adjustable position.
- Do not place articles against the inner side walls or the slotted vents in rear air plenum. (This will obstruct air flow and degrade uniformity).
- Do not overload the unit with large or high-density loads. (This will show by non-uniform processing and/or long heat-through or processing times).

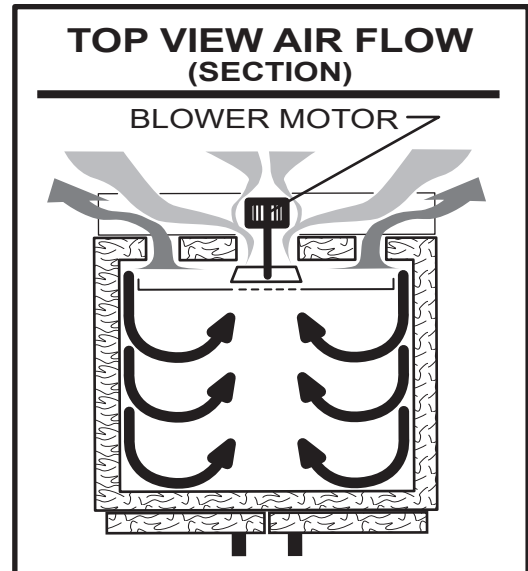


FIG. 4

## Control Calibration

Calibration of the temperature knob dial is only recommended if your process requires certification or if setting is off by more than 20°F, due to contact wear from prolonged use.

**Calibration for this "analog" type control refers to the pointer being centered on the knob temperature marking when measured against an external temperature measurement device reading of the same temperature.**



**DO NOT USE THE CALIBRATION ADJUSTMENT TO OPERATE OVEN AT TEMPERATURES BEYOND ITS RATED RANGE.**

### CALIBRATION

1. Turn the knob dial to the desired temperature and allow the oven to settle at that temperature.
2. Pull the press-fit knob from the thermostat shaft, **(be careful not to change the position of the shaft)**.
3. Using pliers, hold the outside of the shaft, maintaining it in its original position.
4. Using a small flat screwdriver, turn the trim screw, located recessed within the shaft center to increase or decrease temperature (FIG. 5)

**CLOCKWISE (-)**  
Decreases Temperature

**COUNTER-CLOCKWISE (+)**  
Increases Temperature



**Turn the trim screw no more than 1/8 of a turn in the direction needed.** Allow 15 minutes for the temperature to settle at the new setting before taking a new reading. Make subsequent adjustments as needed.



FIG. 5

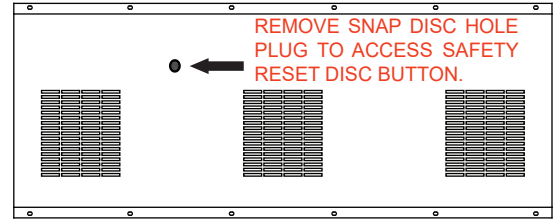
# Safety Alarm Reset

## THERMO SAFETY ALARM

The unit incorporates a thermo safety shut-off. In the event of electronic failure, an internal “snap disc” will cut off power to the unit until it is manually reset. To reset oven, unplug the unit, locate ‘SNAP DISC HOLE PLUG’ (FIG. 6) in the back of the unit. Remove plug and with a NON-METEAL rod press on the button to reset.

### **WARNING:**

**RISK OF ELECTRICAL SHOCK. DISCONNECT UNIT FROM POWER SOURCE BEFORE REMOVING COVER. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY OR DEATH.**




UNITS REAR ELECTRICAL COVER


FIG. 6

## Connecting to the Exhaust Chamber Adapter (Optional)

The optional exhaust chamber adapter is used to vent oven chamber fumes and heated moisture-laden air to a building's exterior for the purposes of minimizing excess heat, humidity or unpleasant but otherwise harmless fumes within an interior working environment.

 The exhaust chamber system as a whole is not designed for use to remove harmful or flammable gases or vapors since the oven itself is not rated for use with such materials

It is recommended that the attached exhaust chamber and piping be checked once a year for any obstruction from dust, dirt, or material process "plaque" build-up from processing certain materials. Check with the manufacturer of the materials used in your process if heating the material may produce a bi-product or out gassing that may build up on the interior surface of the oven, exhaust chamber or piping and present a fire hazard over time.

 Contact an HVAC engineer for assistance with installation or questions regarding proper venting requirements in your specific building or location, and if any local or national fire or safety codes may apply for your application or process.

### CONNECTING TO THE EXAHUST ADAPTER

■ Connect the exhaust chamber adapter with standard 3" or 4" diameter single or double-wall steel or galvanized pipe.

■ A minimum of 4 inches of clearance should be maintained between the connected pipe and any building surface or material. (FIG. 7)

■ For best performance, run a short pipe horizontally (3 feet max.) directly through an exterior wall.

For vertical runs the exhaust pipe should not have more than one (1) 90 degree elbow, a maximum horizontal run of 3', and a maximum of 15' vertically. Exceeding these recommendations may cause improper ventilation.

Poor exhaust quality would be indicated by an excess of fumes and or vapor from around the door gasket versus what would normally be present if no exhaust venting was used.

Piping run lengths can be extended beyond recommended maximums where a connection to an existing ventilation or exhaust system provide a larger pipe diameter and/or a mechanically powered draft that provides a negative pressure at the point of connection. Mechanically powered vent systems work best to eliminate fumes and moisture vapors, but depending on vacuum strength at the point of connection, it may slightly reduce the oven's time-to-temperature and recovery performance.

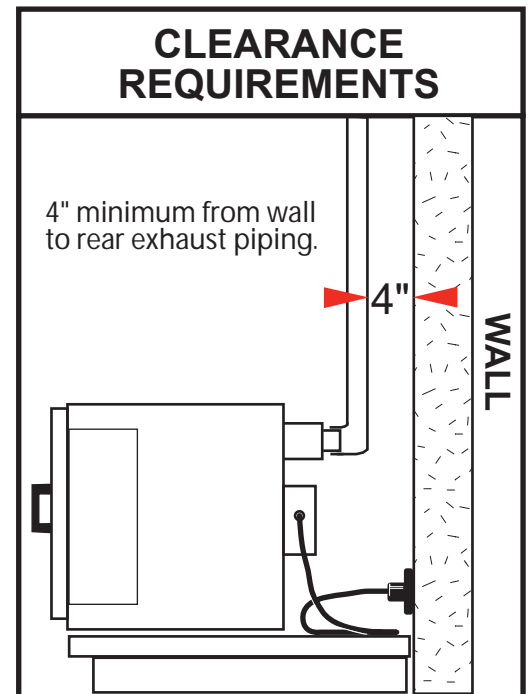


FIG. 7



## Maintenance / Control Calibration / Cleaning Procedures

**The Bench Series Ovens are designed to be virtually maintenance free.** But operational safety requires periodic cleaning and chamber temperature accuracy verification.

### CONTROL CALIBRATION

Twice a year, check the actual oven chamber temperature against a known accurate temperature measurement device. Maintain temperature accuracy to within 20°F of the dial setting. (see Control Calibration on page 4.) Temperature drift or frequent calibration is a sign that the thermostat is failing - replace thermostat upon early observation of temperature instability.

### CLEANING PROCEDURE

Periodically check the rear air intake vents for dirt or dust build-up. Keep the intake & exit ports clear of obstruction and clean of dust and dirt. This will keep the motor from overheating and reduce risk of fire. It may be necessary to remove the rear electrical cover to clean or vacuum dirt and dust from in & around the motor. Unplug the oven before removing the rear cover. To clean exterior and interior surfaces, use a damp cloth or an all-purpose cleaner. Avoid commercially available oven cleaners.

## Troubleshooting Tips / Parts & Equipment / Technical Support

PROBLEM	POSSIBLE CAUSE	WHAT TO DO BEFORE CALLING TECH. SUPPORT
Unit not turning ON when switch is in the ON position	1. <i>No power going to the unit</i>	1. Check if unit tripped a GCFI outlet or fuse. Try a different power outlet connection before moving to number 2 on this list.
	2. <i>Triggered Thermal Safety Disc</i>	2. Reset Thermal Safety disc in the back of the unit. (see PG 4 for more information)
	3. <i>Disconnected / lose wires.</i>	3. Check wire connections and make sure there are no lose or disconnected wires in the unit.
Unit's temperature varies by $\pm 15^\circ\text{F}$ or more	1. <i>After setting a Temperature, it varies widely.</i>	1. Check if motor is running continuously. If blower is working and unit still has a wild varying temperature in any direction, or the oven continuous to heat and trips the Thermal Safety Disc, thermostat may need to be replaced. Contact Quincy Lab for further assistance.
Unit keeps tripping GFCI or fuse	1. Bad GFCI outlet	1. Check if unit tripped a GFCI outlet or fuse. Try a different power outlet connection before moving to number 2 on this list.
	2. Moisture on Heat Elements	2. Heating elements can retain some moisture if not used for a given period of time, or if used in a very humid environment. Allow the unit to heat up for some time to dry out the heat elements.
	3. Short in the unit / circuit overload	3. With the unit unplugged, check loose wires and wire terminal for possible short. Also, check the connections at the ovens' terminal block in the back for loose wires.

### Common Replacement Components

Hydraulic Thermostat

**PART # 101-2223**

Blower Motor

**PART # 301-2235 (115 VOLT)**

**PART # 301-2230 (230 VOLT)**

Door Ball Catch

**PART # 301-2221**



For a complete list of replacement components, part and additional equipment, visit us on the web at [www.quincylab.com](http://www.quincylab.com), scan available QR codes or contact your dealer for availability and pricing.

### Common Additional Equipment

Additional Shelf

**PART # 301-5000**

Additional Shelf Rail

**PART # 301-5001**

**PART # 301-5001S (STAINLESS STEEL)**

Exhaust Chamber Adapter

**PART # 301-2065**

Floor Oven Stand

**PART # 301-2060**

Storage Cabinet

**PART #301-2055**



## Technical Support

Contact Quincy Lab technical support for further assistance or visit us on the web at [www.quincylab.com](http://www.quincylab.com)

**Email:** [information@quincylab.com](mailto:information@quincylab.com)

**Voice:** 800-482-4328 Opt.2

**Fax:** 773-622-2282

Quincy Lab, Inc.

109 Shore Dr.,

Burr Ridge, Illinois 60527

## Limited Warranty



Quincy Lab, Inc. warrants to the original purchaser that this product will be free from defects in material and workmanship under normal use throughout the warranty period. The standard warranty period for this instrument is twenty four (24) months from date of shipment. The instrument warranty is supplemented with a three year warranty on the heating element. Please refer to your invoice or shipping documents to determine the active warranty period. This warranty covers parts & labor (labor at factory only) and shipping cost for replacement parts.