



Model AFE Digital Series Lab Ovens

With Microprocessor Control & Digital Display

OPERATING MANUAL



Standard Contents

- (1) AFE Series Lab Oven
- (2) Adjustable chrome wire shelf
- (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



SPECIFICATIONS	MODEL 10AFE	MODEL 20AFE	MODEL 30AFE	MODEL 40AFE
INTERIOR DIMENSIONS INCHES W x H x D (CM) W x H x D	12x8.63x10 30.5x22x25.4	13x11.63x13 33x29.5x33	18x14.63x12 45.7x37x30.5	18x19.63x14 45.7x50x35.5
EXTERIOR DIMENSIONS INCHES W x H x D (CM) W x H x D	14x20.5x12 35.5x52x30.5	15x24.5x15 38x61x38	20x28.5x14 52x72.4x35.5	20x33.5x16 52x85x40.63
TEMPERATURE RANGE Ambient + 25°F to: F / C	450°/232°	450°/232°	450°/232°	450°/232°
CONTROL STABILITY Typically +/- F / C	0.5°/ 1.0°	0.5°/ 1.0°	0.5°/ 1.0°	0.5°/ 1.0°
WEIGHT (lbs) SHIPPING STAND ALONE	44 38	61 54	78 70	94 85
STANDARD ELECTRICAL VOLTS/AMPS WATTS PLUG/NEMA	120/6.6* 800 5-15P*	120/8.8* 1050 5-15P*	120/12.5* 1500 5-15P*	120/12.5* 1500 5-15P*

* Standard models voltage only, optional 220 voltage available. For power requirements, see electrical info on label located at the rear of the oven.

Common Unit Construction

Exterior: Powder Coated Steel	Interior: Aluminized Steel
Insulation: Fiberglass	Motor: Sleeve Bearing, Thermally Protected
Thermo-control: PID Microprocessor	Heater: Resistive-Tubular Incoloy

-  **WARNING:** READ INSTRUCTIONS THOROUGHLY BEFORE OPERATING OVEN
-  **WARNING:** RISK OF ELECTRICAL SHOCK. DISCONNECT UNIT FROM POWER SOURCE BEFORE REMOVING COVER
-  **CAUTION:** EXTERIOR SURFACES MAY BECOME HOT DURING OPERATION
-  **WARNING:** DO NOT USE WITH FLAMMABLE LIQUIDS OR GASES
-  **WARNING:** NOT FOR USE WITH OPEN LIQUIDS
-  **WARNING:** CARE SHOULD BE TAKEN WHEN CARRYING/LIFTING UNIT INTO PLACE. LARGER UNITS ARE HEAVY AND MAY REQUIRE TWO PEOPLE TO TRANSPORT OR INSTALL.

Safety Precautions  Read Operating Instructions Thoroughly Prior to Operation

 The AFE Series lab ovens are not designed for use with any flammable solvents or gases or for materials that may contain flammable solvents or gases. Use only a grounded outlet that is rated for your model's electrical requirement. Oven exterior walls and doors may become hot to the touch when operating at higher set temperatures. Do not leave the oven unattended during operation, especially when processing materials that have flash point temperatures lower than the model oven's maximum operating range. Do not modify the oven or control parameters to operate the oven above the stated maximum operating temperature.

Set-up

Position unit in its ultimate operating location. Keep a minimum of 2" of airspace around the unit and a minimum of 10" above the unit. The port holes at the top of the unit will expel a small amount of warm air through natural convection. This port can also be used as an access for an external temperature probe to verify the chamber's temperature or the chamber's contents directly.

Install adjustable shelf by placing the ends of the wire shelf bracket into the corresponding holes located on the inner sides of the oven at the desired height. Push the ends of the bracket into the holes until the first bends in the bracket are against the wall, then rotate the bracket down. Place the shelf on the brackets. **(FIG 1)**

Plug the unit into a grounded outlet for your unit's rated voltage.

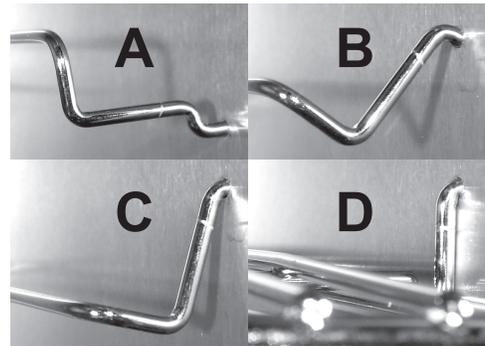


FIG. 1

General Operation

The unit is ready for your immediate use. All control parameters, calibration and tuning has been done at the factory, no adjustments are necessary.

Push the illuminated power button. All LED's on the temperature control will light-up and display the current chamber temperature and the set temperature.

Set temperature is constantly displayed in the lower right-hand corner of the display. To change the set temperature, simply press either the up arrow key or the down arrow key, until desired set temperature is reached. **(FIG. 2)** The temperature control is set at the factory to read in 1/10th degree F, or Fahrenheit units.

To change Controller functions see: Menu Level Functions Guide (see page insert).

Once the unit nears the desired temperature allow the unit to cycle for 20 minutes at set point before temperature becomes fully stable. **NOTE:** Upon each initial powering-up, the control may typically overshoot the set temp by 3 or 4 degrees especially if the temperature set point is close to the operating ambient temperature. After equilibrium is achieved the control will hold set temperature within 1 unit degree.

NOTE: FLASHING YELLOW LIGHT **OUT** INDICATES NORMAL OPERATION.



-  Enter/Exit Menu
 -  Menu Scroll
 -  Increase/Decrease Setpoint
- (PRESS)*

FIG. 2

General Operation (Continued)

Unit Safety Reset- If the unit exceeds its maximum temperature, an internal safety “snap disc” will cut power to the unit until it is manually reset. To do this, unplug the unit, lay it on its back and remove the bottom cover. Locate the round safety “snap disc” and push in 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.

Chamber Loading

Article processing times and temperature uniformity are largely dependent on load density and positioning. Load the oven so that air circulation within the oven is not impaired. Here are some general guidelines:

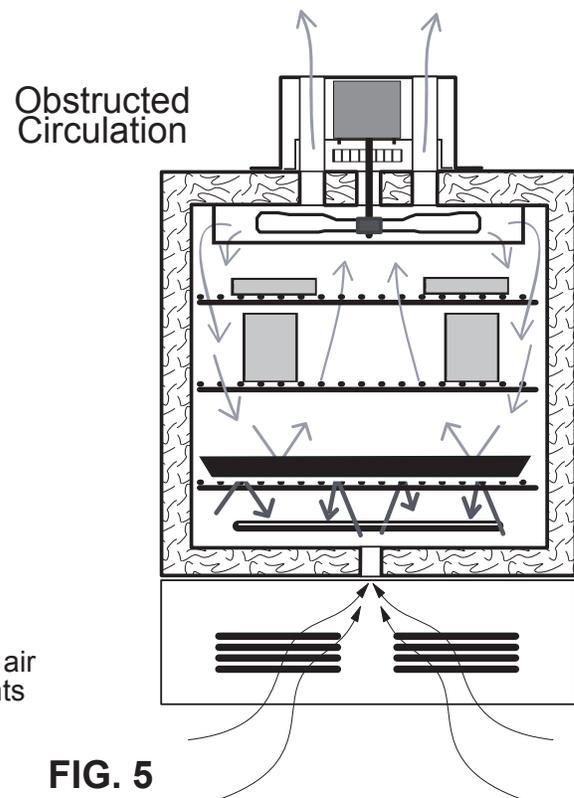
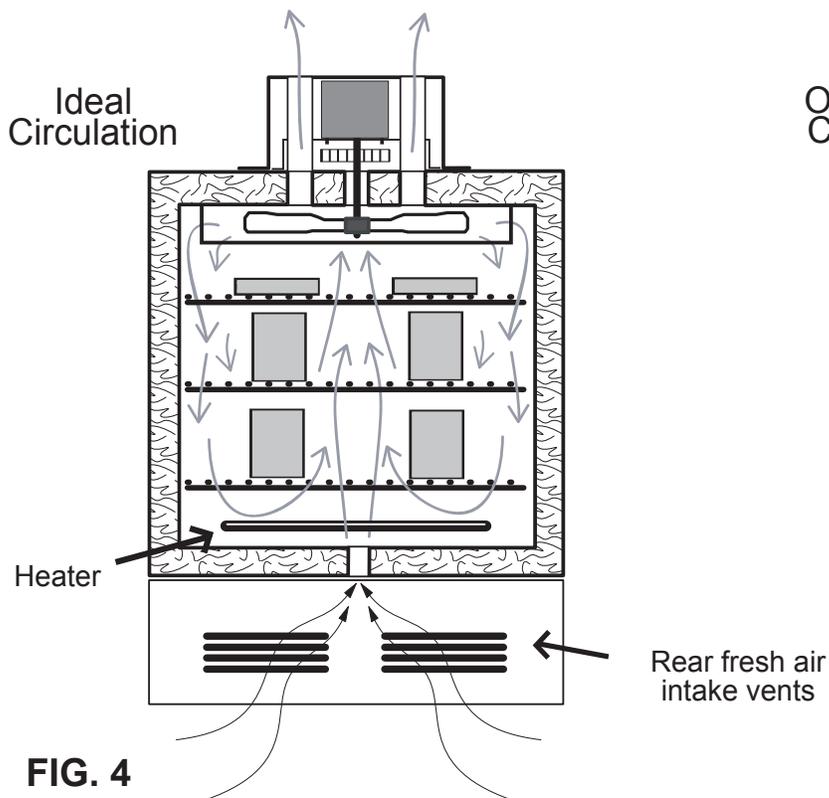
Leave a space between articles on a shelf. Stagger articles from those on lower shelves.

Do not overload the unit with large or high-density loads. This will show by non-uniform processing and/or long "heat-through" times where control display temp is slow to return or achieve set temperature.

For best processing performance for a single item, adjust one shelf so that the article is centered in the oven chamber.

Position articles on shelves as shown in **(FIG 4)**, for best results avoid placing articles or media against or within an inch of the walls, especially on the lower shelf, allowing unrestricted air flow around articles and contributing to even and consistent heating.

Use of large solid trays, or foil on shelves severely limits the oven's ability to distribute heat evenly and uniformly. **(FIG 5)** Since not enough heat rises within the chamber, temperature readings may give a false indication that temperature setting is too low. Higher temperature adjustments made as a result of these readings could overheat the lower-placed articles or media.



Do not overload the unit with large (in quantity OR size), or high-density loads. This will show by non-uniform processing and long or impossible "heat-through" times. To help determine a large load's suitability, compare the time it takes for the temperature to recover to the original empty chamber set temperature once load is placed. To reduce recovery time, reduce load accordingly. Also, large loads such as a beaker containing 2 liters of solution, may require an elevated set temperature for the solution to reach and maintain a lower target temperature.

Chamber Loading (Continued)

Care should also be taken to avoid placing items on the top-most shelf too close to the holes in the fan plenum. This will restrict the flow of air passing through the plenum and reduce the amount of pre-heated air being circulated through the entire chamber and cause longer than normal heat-through times and inconsistent or unstable oven temperatures.

NOTE: The unit's minimum operating temperature is largely determined by ambient temperature. The unit can operate 25 degrees F (approximately 15 degrees C) above room temperature but temperature stability may be degraded. Temperature stability improves appreciably for settings that exceed ambient by 40 degrees F or better. As a general rule, the lower the ambient temperature, the lower the maximum adjustable operating temperature.

Common Replacement Components

All replacement components are readily available and are easily replaced in the field.

COMPONENT	MODEL	VOLTAGE	PART #	COMPONENT	MODEL	VOLTAGE	PART #
Motor	All	115 Volt	205-2030	Digital Controller	All	All	401-1230
Motor	All	230 Volt	205-2031	Relay	All	All	401-1233
Rocker Switch	All	115 Volt 230 Volt	201-2213 201-2213-1	Fuse (10 amp)	10, 20	All	Q-1191
Thermocouple	All	All	701-6253	Fuse (15 amp)	30, 40	All	Q-1190
Friction Catch (set)	All	All	101-2221	Fuse Holder (red)	All	All	Q-1198
6' Cord & Plug	20, 30, 40	115 Volt 230 Volt	101-1403 101-1403-1	Wire Shelf	10	All	101-1000
6' Cord & Plug	10	115 Volt 230 Volt	101-1603 101-1603-1	Shelf Supports (2)	10	All	101-1001
Fan Blade	10	All	205-1018	Wire Shelf	20	All	201-2000
Fan Blade	20, 30	All	205-2018	Wire Shelf	30	All	101-3000
Fan Blade	40	All	205-3018	Wire Shelf	40	All	201-4000
Fan Blade 3" Heat Sink	All	All	205-4018	Shelf Supports (2)	20, 30, 40	All	101-3001

Periodic Oven Maintenance

The AFE Series Lab Ovens are designed to be virtually maintenance free. But operational safety requires periodic cleaning and chamber temperature accuracy verification. 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. Once a year, check the actual oven chamber temperature against a known accurate temperature measurement device. Maintain temperature accuracy to within 5 degrees F of the control setting. Calibrate the control as necessary. To clean exterior and interior surfaces, use a damp cloth or with an all-purpose cleaner. Avoid commercially available oven cleaners.

Technical Support

If you have any questions or need technical assistance, please contact Quincy Lab Tech Support at

Email: information@quincylab.com
Voice: 800-482-HEAT (4328)
Fax: 773-622-2282

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Visit us on the web at www.quincylab.com

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 eighteen 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.



Menu Level Functions Guide

To access menu for common menu functions, refer to **Menu Guide** below: Menu setting changes are quick and easy with our new 5-button digital microprocessor. Through the use of these controls you can: set the operating temperature, lock the set-temperature, select either degrees F or C, calibrate your unit to your independent device, and auto-tune your oven to your specific application.

Digital Controller Function Buttons

				
Enter / Exit MENU	MENU Scroll	Changes digit cursor on set temperature	Decrease	Increase

To set setpoint temperature

		Up and down arrow keys (shown left) are used to increase or decrease set-point control temperature as desired by user
Decrease	Increase	

To adjust control to read in C or F temperature units

			Temperature units can be changed quickly between Fahrenheit and centigrades using arrow keys.
Hold 3 sec.	Hit ONCE	Use   to choose F or C	Default set to F

To lock setpoint temperature

			Lock setpoint by changing to '3'
Hold together 3 seconds			Default set to 0

To calibrate control to independent probe/sensor

			To calibrate oven, add (or subtract) the temperature differential, to the existing iNS value shown at prompt
Hit ONCE	Hit ONCE	Use   keys to enter temperature shift in degrees	

To Auto-tune oven

		All ovens are Auto-tuned at the factory using the 'At-1' option for faster response time. You may, however, want to Auto-tune your oven to your specific application. To do this, once at the 'At' prompt (at left), use arrow keys to initiate either Auto-tune option: 'At-1' (for 40% Auto-tune), or 'At-2' (for 100% Autotune). The 40% Auto-tune (At-1), will stabilize the oven temperature quicker and with less 'overshoot' than the 100%, but will be somewhat less precise. The 100% Auto-tune (At-2), will take longer to stabilize oven temperature but will be more precise, and take a little longer to complete the Auto-tune process.
Hit ONCE	Use   keys to change setting	Default set to 40%

Control Self Diagnostics

Control prompts will only display when a fault or alarm condition exists.

ALARM Codes "S.ERR" & "- - - -"

	or	
Indicates Input Error		
Check to make sure Thermocouple wiring is connected securely		

ALARM Code "E333"


Indicates Internal Circuit Error
Turn Controller OFF and On. If problem remains, replace Controller

ALARM Code "E111"


Indicates Internal Memory Error
Turn Controller OFF and On. If problem remains, replace Controller

ALARM "Over Maximum Temperature" SUB1 OUT

When the oven exceeds its maximum operating temperature a safety alarm in the controller will cut power to the heating elements. Allow the units temperature to drop below its maximum temperature and/or cool before reset. To reset unit, power OFF and ON to clear alarm status. If problem remains, please contact technical support for assistance.

