



# FireLite Operation Manual



## Table of Contents

Specifications .....	2
Accessories .....	3

### Chapter One — Getting Started

Before Unpacking .....	3
Unpacking .....	3
Lifting and Carrying .....	3
Furnace Requirements .....	4
Mounting the Keyboard .....	5
Installing the Vacuum Pump .....	5
Volume Control .....	6
Front Panel Controls and Indicators .....	6
Menu Selection Buttons .....	6
Changing Units of Measurement Between English and Metric .....	7
Night Mode .....	8
Idle Temperature Operation .....	8

### Chapter Two — Special Function Input

Customize Program Finish Tune .....	9
Fast Cool with Vacuum .....	10
Adjusting Calibrations for Low-Fusing and High-Fusing Porcelains .....	10
Adjust High-Fusing Porcelain Calibration .....	10
Adjust Low-Fusing Porcelain Calibration .....	10
Displaying Muffle Hours .....	11
Displaying Software Version .....	11
Error Messages .....	11

### Chapter Three — Entering and Editing Programs

To Enter and Edit a Program .....	12
Changing a Program While it is Running .....	12
Available Program Parameters .....	12

### Chapter Four — Running a Program

To Start a Program .....	13
Skipping a Program Step .....	13

### Chapter Five — Maintenance

Cleaning Your Furnace .....	13
Replacing the Muffle .....	13
If More Help is Needed .....	14

### Replacement Parts

Parts List .....	15
------------------	----

### FireLite Accessory

High Efficiency Vacuum Pump .....	14
-----------------------------------	----

### Conversion Table

Fahrenheit to Celsius .....	15
-----------------------------	----

### Other Products from Whip Mix .....

## Specifications

Power: 110 VAC +/- 10% 50/60 Hz

Power Consumption:

Furnace and Pump: 1,400 W Max

Outputs: Pump Accessory Power: 85–245 VAC,  
50/60 Hz, 300 W Max

Dimensions: 13 $\frac{1}{2}$ " wide x 13 $\frac{1}{2}$ " deep x 20 $\frac{1}{2}$ " high

Temperature: 1,200° C / 2,190° F Max

Weight: 50 lbs.

Muffle Chamber: 3 $\frac{3}{4}$ " diameter x 2 $\frac{1}{2}$ " high

Fuse ratings and characteristics:

115 Volt units: Type 326, 12 amp Slo Blo ceramic fuse,  
3AB style. 230 Volt units: Type 218- T, 6.3 amp Slo Blo  
ceramic fuse, 5 x 20 mm style.

## Minimum and Maximum Values

Minimum entry temperature = 65° C/149° F

Maximum entry temperature = 650° C/1,202° F

Maximum entry time = 60 minutes

Minimum heat-rate = 1° C/minute

Maximum heat-rate = 100° C/minute/181° F

Maximum final temperature = 1,200° C/2,192° F

Maximum vacuum = 76 cm/30 inches of Mercury

Maximum idle temperature = 650° C/1,202° F

## Accessories

The following accessories will be found with your FireLite furnace. If you are missing any of these please call Whip Mix at (800) 626-5651.

Cooling Tray	Operator's Manual
Firing Tray	Dry-Erase Program Log Magnets*
Power Cord	

\*Only use dry-erase marker



## Chapter One — Getting Started

You are undoubtedly eager to unpack, set up, and begin using your new furnace. Getting started will be much easier if you carefully review the information in this chapter and follow the steps as outlined.

### Before Unpacking

- When you unpack your furnace, be sure to save the carton and packing materials. These can be used again if there is a need to ship or return equipment.
- Be sure to read and save the printed shipping material packed with your furnace — it contains valuable information.
- DO NOT turn on the power to your furnace until you are instructed to do so.

### Unpacking

- If the packing materials and/or the furnace appear to be damaged, call your dealer before continuing.
- Remove the furnace from the carton and place it on a flat surface.
- Look up into the muffle area and locate the orange shipping bar and wingnuts. Remove the wingnuts and push the two bolts and attached brackets out of the orange bar. Finally, remove the orange bar by sliding it out the side. Keep these parts in case there is a need to ship the furnace.

### Lifting and Carrying



**NEVER ATTEMPT TO LIFT OR CARRY THE OVEN WITHIN ONE HOUR OF DISCONNECTING THE POWER AFTER IT HAS BEEN IN USE.**

If you are preparing to ship the unit in its carton to a location outside your current facility, allow the furnace to cool with the platform down and, once it is cool to the touch, remove the white ceramic fiber firing tray from the table and pack it in the accessory box. Damage to the oven will result from shipment of the oven with the firing tray inside the muffle. Push the up button to run the table to the muffle. Install the orange aluminum shipping bar underneath the table by reversing the above instructions.

Before the power is disconnected, use the front panel up arrow button to raise the platform to its full up position, then disconnect the power and wait at least one hour to allow the oven table and other surfaces to cool to room ambient temperature.

If you are relocating the oven inside the current facility or have used a protective glove to remove the firing tray from the table, continue below.

Remember to disconnect both the mains power cord and the pump accessory power cord and also remove the vacuum tubing from the vacuum inlet at the rear of the oven.

The oven weighs approximately 50 pounds (25 kg). A four-wheeled platform cart is recommended if the new location is more than a few feet away. Position the oven with the Mains Power Switch closest to the front edge of the work surface. Feel underneath the table and the table lift arm to ensure the surfaces are cool to the touch. Slide your right arm just underneath the table lift arm as close to the chassis as possible. Use your left hand to grasp the overhang of the chassis back just above the vacuum inlet. Raise the oven two inches, keeping it over the work surface until your back and arms confirm that you are able to control the oven without injuring yourself. Step back from the work surface and pivot slowly until you are headed in the desired direction. Reverse the above sequence to place the oven in the new location. Refer to page 5 to reconnect the power and vacuum ports.



**THE OVEN SHOULD NEVER BE PLACED ON A FLAMMABLE WORK SURFACE. NEVER PLACE THE OVEN IN A LOCATION WITH OVERHEAD SHELVING OR CABINETS THAT COULD INTERFERE WITH THE VENTILATION SLOTS IN THE TOP OF THE MUFFLE HOOD.**

## Furnace Requirements

- The furnace requires 120 VAC and 12 amps of current. A special heavy-duty power cord has been supplied with your furnace.



**DO NOT OPERATE ON ANY OTHER POWER CORD. DO NOT OPERATE WITH AN EXTENSION CORD. OPERATING THIS FURNACE ON A CIRCUIT WITH OTHER FURNACES OR ELECTRICAL APPLIANCES THAT REQUIRE SIGNIFICANT POWER MAY CAUSE A CIRCUIT BREAKER TO TRIP. INSTALL THE HEAVY-DUTY SAFETY GROUNDED POWER CORD AND PLUG THE FURNACE INTO A GROUNDED OUTLET.**

- Position the furnace so the front is facing you. Be sure to have at least eight inches on all sides of the furnace to allow sufficient air flow to keep the furnace cool. Do not place anything flammable near the furnace.
- Minimum ambient room temperature 60° F (15.5° C). Maximum ambient room temperature 80° F (26.6° C). Minimum relative humidity 45%. Maximum relative humidity 60%.
- The mains power On/Off switch is located on the left side of the chassis. It is a rocker-type switch with a “1” and a “0” symbol embossed on it. When the “1” side is depressed, the mains power will be applied to the oven. When the “0” side is depressed, the mains power will be removed from the oven. Never position the oven in such an orientation where the operator has to lean over the top of the oven to reach the mains power switch.



**THE TRIANGULAR BLACK AND YELLOW STICKER ON THE FRONT CENTER EDGE OF THE MUFFLE HOOD IS A WARNING THAT THE METALLIC SURFACE CAN BECOME HOT TO THE TOUCH. NEVER PLACE YOUR HAND ON THIS SURFACE OR LEAN ON THE TOP OF THE HOOD WHEN THE UNIT IS IN OPERATION.**



**USE OF THIS OVEN IN ANY MANNER NOT PROSCRIBED IN THIS MANUAL MAY RENDER OPERATOR SAFETY FEATURES INEFFECTIVE.**

- Turn on the furnace using the power switch located on the left side of the furnace. The display will light up and the furnace will perform a series of internal self-tests. During these self-tests you will hear the pump turn on and off.
- The lift will lower. Place the firing tray on the center of the lift table.



**CAUTION: NEVER OPEN THE INTERIOR OF THE CHASSIS BEFORE FIRST REMOVING THE AC ELECTRICAL POWER CORD. THERE ARE DEADLY VOLTAGES INSIDE.**

If you experience a power outage while firing, the firing table can be raised or lowered manually.

- Open the back cover by removing the screws on the left side with an Allen wrench as seen in Figure 1.
- With pliers, turn the metal rod located to the right of the shaft as seen in Figure 2.



Figure 1



Figure 2

## Intended Use

The FireLite furnace is intended for the firing of dental porcelain materials only.

If the furnace is not used in a manner specified by Whip Mix Corporation, the protection provided by the product may be impaired.

## Mounting the Keyboard

When you unpack your FireLite furnace, the keyboard will be located in the accessory box.

1. Remove keyboard from accessory box and loosen the thumbscrews.



Figure 3

2. Flip the keyboard around to the proper orientation as seen in Figure 3. One lock-washer goes on the outside of the brackets on each side and one lock-washer sits between the keyboard and the inside of the bracket. Adjust the keyboard to the desired position and tighten the set screw.

3. To complete the keyboard installation, simply plug the keyboard cable into the back of the keyboard until you hear a click as seen in Figures 4 and 5.



Figure 4



Figure 5

## Installing the Vacuum Pump

- If you have a Whip Mix supplied vacuum pump, simply attach the pump power cord into the international standard outlet on the furnace marked **Vacuum Pump**, as seen in Figure 6.



Figure 6

- If you do not have a Whip Mix supplied vacuum pump, plug the vacuum pump's power cord into the outlet end of the short power cord supplied with the furnace.
- Attach the other end of this short power cord to the international standard outlet on the rear of the furnace marked **Vacuum Pump**.
- Attach a 1/4 inch vacuum rated hose from the vacuum pump to the brass fitting marked **Vacuum Pump** at the rear of the furnace.

**Note:** The vacuum pump will only run continuously. Whenever a program requires vacuum, the pump will run continuously until vacuum is no longer required.

## Volume Control

After the self-test, the furnace will play a tune to let you know it is ready to run a program. You can adjust the volume of the tune by turning a potentiometer located in the furnace.



Figure 7

To adjust the volume of the furnace:

1. Locate the small white button just above the power switch as seen in Figure 7.
2. Remove the white button with a flat-head screwdriver.
3. Insert the screwdriver through the hole and make sure the screwdriver sits on the groove of the potentiometer.
4. Turn the screwdriver clockwise to increase the volume or counter-clockwise to decrease the volume.

## Front Panel Controls and Indicators

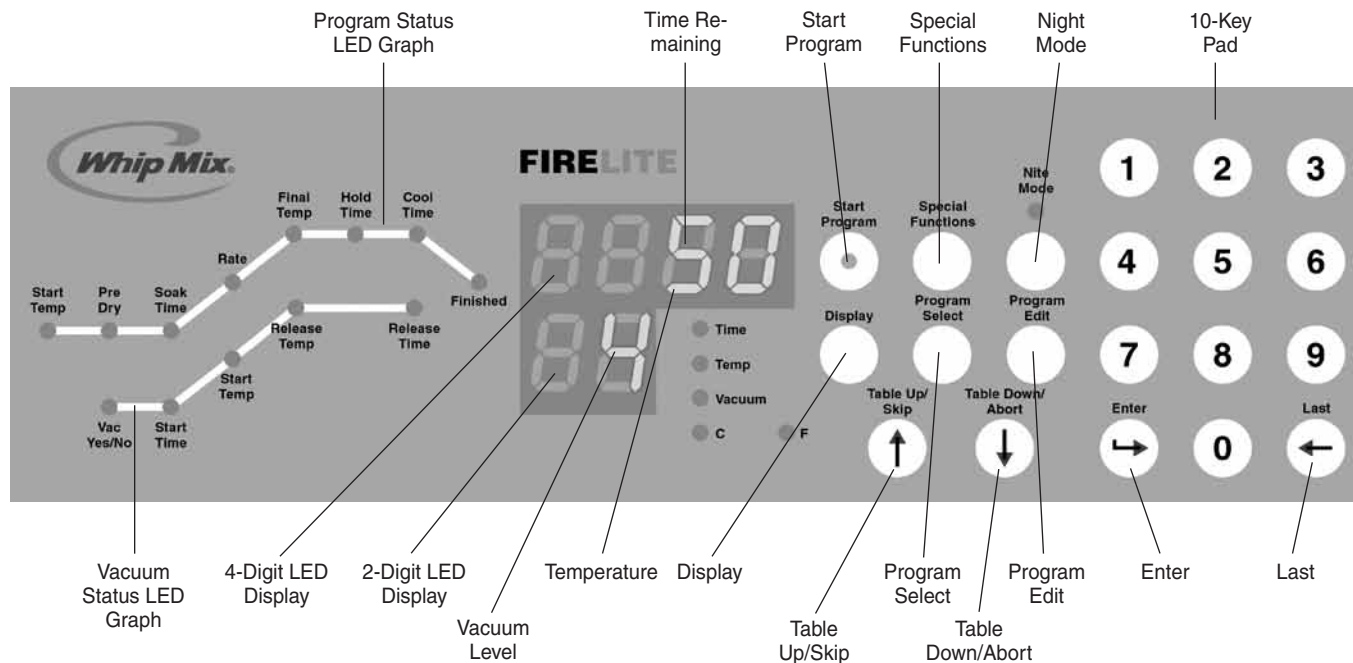


Figure 8

## Menu Selection Buttons

### 4-Digit LED Display

When a program is not running, the display will automatically show the muffle temperature. If a program is running, the default display is time remaining to finish the program. The 4-digit display indicates:

- the time remaining in minutes/seconds. If the time remaining for a program is greater than 99 minutes, 59 seconds the time will be in minutes only.
- the muffle temperature when the temperature light is illuminated. When entering the rate rise for a program, the rate rise will be displayed as degrees per minute.
- the vacuum level when the vacuum light is on.
- temperature and vacuum in Celsius or English units of measure. The °F/Inches light indicates that the furnace is operating in English units of measurement. The °C/Centimeters light indicates that the furnace is operating in Metric units of measure.

### 2-Digit LED Display

Indicates active program number. Except when a program is calling for vacuum, then the display shows the current vacuum level. The 2-digit window will also display:

- the Special Function number when entering a special function.
- ER to indicate an error condition.
- FR or DR to indicate frequency or duration of a tone when customizing a user-defined tone.

### Display Button

Pressing **Display** will cause the four-digit display to cycle:

- from time remaining to temperature.
- from temperature to vacuum.
- from vacuum to time remaining.



After approximately one minute, the display will revert from the item being displayed to the time remaining if a program is running or to muffle temperature if the furnace is in idle mode.

### Program and Vacuum Status LED Graphs

- Indicates the item being entered while entering a program.
- Indicates the status of a program while running.

### Start Program Button

Pressing this button will start the selected program number displayed in the 2-digit display.

### Special Function Button

Press **Special Function** to perform furnace setup. Special functions are covered in detail in **Chapter Four — Running a Program**.

### Keypad

The **keypad** is used to enter numeric data.

### Enter Button

Press the **Enter** button to:

- store the input data.
- proceed to the next item when entering input information.
- clear an error message on the display.

### Program Select Button

Used to select a program to run. Valid program numbers are from 1 through 50.

- Press the **Program Select** button.
- Input the desired program number you wish to run. The program number will be displayed in the 2-digit display.
- Press the **Start Program** button to start the program shown in the 2-digit display.

**Note:** Program number 0 is a special program. **DO NOT** run or use program number 0 to edit or store your program.

### Program Edit Button

- Pressing **Program Edit** allows you to edit a program. Editing programs is covered in detail in **Chapter Two — Special Functions Input**.
- Pressing **Program Edit** while a program is running will allow you to make temporary changes to the program currently running. After the changed program has run, the program will revert to its original values. Changing programs is covered in detail in **Chapter Three — Entering and Editing Programs**.

### Up/Skip Button

- While in idle mode, press the **↑/Skip** once and the lift moves upward. Press again and the lift stops moving.
- While the lift is moving down, press the **↑/Skip** and the lift will begin moving up.
- While a program is running, press the **↑/Skip** and the program will skip to the next step. For example, pressing the **↑/Skip** button during the soak time will advance the program to the rise rate. Pressing **↑/Skip** again will advance to the final temperature.

### Down/Abort Button

- While in idle mode, press the **↓/Abort** once and the lift moves downward. Press again and the lift will stop moving.
- While the lift is moving up, press the **↓/Abort** and the lift will begin moving down.
- While a program is running, pressing the **↓/Abort** will cause the program to abort and the lift to move to its lower position.
- Press the **↓/Abort** while changing a program or while entering a special function and the program entry or special function will abort without changing the previous contents of the program or special function.
- While in any mode, press the **↓/Abort** and the furnace will return to idle mode.

---

## Changing Units of Measure Between English and Metric

The furnace can be changed from Metric to English units of measure or from English to Metric units while in idle mode. Programmed values are automatically converted.

### Follow these steps to convert from Metric to English:

1. Press the **Special Function** button.
2. Press **2** on the keypad.
3. Press the **Enter** button.

### Follow these steps to convert from English to Metric:

1. Press the **Special Function** button.
2. Press **1** on the keypad.
3. Press the **Enter** button.

## Night Mode

Placing the furnace in night mode keeps the muffle idling at a low temperature, preventing a buildup of moisture during the night. This special function password allows the user to set the night mode temperature of the furnace.

The furnace comes from the factory with the night mode temperature set to 150° C. The furnace will remain at this temperature when night mode is in operation.

- Pressing the **Night Mode** button while a program is running will cause the furnace to enter the night mode after the program has finished running.

- Pressing **Night Mode** while the furnace is idling will cause the furnace to enter night mode immediately.

**Important** — Before firing porcelain for the first time, it is best to rid the muffle of all moisture. The easiest way to do this is to use the **Night Mode** for several hours.

---

## Idle Temperature Operation

The furnace will be in the idle mode of operation after any of the other modes are completed or whenever the **↓/Abort** button has been pushed to abort an operation. The furnace comes from the factory with the idle temperature set to 0° C. The furnace will idle at idle temperature whenever a program is aborted or finished.

### Setting the Idle temperature:

1. Press the **Special Function** button.
2. Press **22** on the keypad.
3. Press the **Enter** button.
4. Input the desired idle temperature using the keypad.
5. Press the **Enter** button.



## Chapter Two — Special Function Input

The FireLite furnace has several special functions that allow the furnace operation to be customized to your needs.

### Customize Program Finish Tune

The FireLite furnace has a unique feature to allow you to customize the tune that plays indicating a program is finished. This allows you to distinguish one furnace from another when a program is finished. FireLite allows you to program four tunes to play one after another. You need to enter the frequency and the duration for each tune. The furnace will play back all the tones right after they have been entered. You can reprogram the tones as many times as you want.

#### Setting Program Tunes:

1. Press the **Special Function** button.
2. Press **55** on the keypad.
3. Press the **Enter** button.
4. Use the keypad to enter the frequency of the first tune. The four-digit display will show a default number and the two digit display will show FR. This indicates the frequency of the first tune. The larger the number the lower the pitch. The lower the number, the higher the pitch. **The acceptable range is from 0 to 1,000 however, the recommended range of values are between 400 and 1,000.**
5. Press the **Enter** button.
6. The four-digit display will show a default number and the two-digit display will show DR. This indicates the duration of the first tune.
7. Use the keypad to enter the duration of the first tune. Generally 500 represents one-second duration. The higher the value, the longer the duration. **The acceptable range is from 1 to 1,000 however, the recommended range of values are between 400 to 1,000.**
8. Press the **Enter** button.
9. The two-digit display will show FR to indicate the frequency of the second tune. Use the keypad to enter the frequency of the second tune.
10. Press the **Enter** button.
11. The two-digit display will show DR to indicate the duration of the second tune. Use the keypad to enter the duration of the second tune.
12. Press the **Enter** button.
13. The two-digit display will display FR to indicate the frequency of the third tune. Use the keypad to enter the frequency of the third tune.
14. Press the **Enter** button.
15. The two-digit display will show DR to indicate the duration of the third tune. Use the keypad to enter the duration of the third tune.
16. Press the **Enter** button.
17. The two-digit display will display FR to indicate the frequency of the fourth tune. Use the keypad to enter the frequency of the fourth tune.
18. Press the **Enter** button.
19. The two-digit display will show DR to indicate the duration of the fourth tune. Use the keypad to enter the duration of the fourth tune.
20. Press the **Enter** button.
21. The furnace will play the customized tune once. After that, the four-digit display will show the temperature of the furnace and the two-digit display will show the program number.

**Note:** Entering 0 as frequency would represent a silent or pause between note segments for the specified duration.

**Note:** The recommended range of duration of the tone is from 400 to 1,000 and the recommended range of frequency is from 400 to 1,000. The higher the number of duration, the longer the length of the tone. The higher the number of frequency, the lower the pitch of the tone.

## Fast Cool with Vacuum

The FireLite comes from the factory with a Fast Cool Vacuum feature. This feature automatically turns on the vacuum pump between programs to cool the muffle to the entry temperature of the new program.

### To use this feature:

1. Press the **Start Program** button.

**Note:** If the final temperature of the last program is higher than the start temperature of the new program, the vacuum pump will automatically come on.

### To deactivate this feature:

1. Press the **Special Function** button.
2. Press **82** on the keypad.

3. Press the **Enter** button.
4. Press **0** (zero) to change the display from YES to NO
5. Press the **Enter** button.

### To reactivate this feature:

1. Press the **Special Function** button.
2. Press **82** on the keypad.
3. Press the **Enter** button.
4. Press any number key between **1** and **9** to change the four-digit display from NO to YES.
5. Press the **Enter** button.

---

## Adjusting Calibrations for Low-Fusing and High-Fusing Porcelains

All porcelain furnaces fire slightly differently. Even porcelain furnaces from the same manufacturer can fire porcelains at slightly different temperatures. The FireLite addresses this problem by allowing you to customize the calibration. This feature can be used to adjust your furnace to fire porcelains at manufacturers' recommendations, or to adjust multiple furnaces to fire identically.

The FireLite calibration can be adjusted for normal high-fusing porcelains and for the new low-fusing porcelains. These adjustments do not affect each other, so both adjustments can be used if you fire both types of porcelain. The adjustments can range from 0° C/32°F to 50° C/90° F.

---

## Adjust High-Fusing Porcelain Calibration (800° C/1,470° F or above)

### Overfires:

1. Press the **Special Function** button.
2. Press **18** on the keypad.
3. Press the **Enter** button.
4. Enter the number of degrees to adjust the calibration downward.
5. Press the **Enter** button.

### Underfires:

1. Press the **Special Function** button.
2. Press **19** on the keypad.
3. Press the **Enter** button.
4. Enter the number of degrees to adjust the calibration upward.
5. Press the **Enter** button.

---

## Adjust Low-Fusing Porcelain Calibration (800° C/1,470° F or below)

### Overfires:

1. Press the **Special Function** button.
2. Press **16** on the keypad.
3. Press the **Enter** button.
4. Enter the number of degrees to adjust the calibration downward.
5. Press the **Enter** button.

### Underfires:

1. Press the **Special Function** button.
2. Press **17** on the keypad.
3. Press the **Enter** button.
4. Enter the number of degrees to adjust the calibration upward.
5. Press the **Enter** button.

## Displaying Muffle Hours

To see the number of hours the muffle has been over 605° C:

1. Press the **Special Function** button.
  2. Press **90** on the keypad.
  3. Press the **Enter** button.
- 

## Displaying Software Version

To display the version of the software running in your furnace:

1. Press the **Special Function** button.
  2. Press **9** on the keypad.
  3. Press the **Enter** button.
- 

## Error Messages

The FireLite furnace contains several self-checks and error detection circuits. The following error messages may occur:

ER 1 and ER 9 — **No Vacuum Error** — The program called for a vacuum and after two minutes the vacuum didn't reach an acceptable level. Clean the lift platform and the O-Ring seal. Check all vacuum connections of the pump and the furnace. Try the program again.

ER 2 — **Thermocouple Error** — The electronics have detected an open circuit in the thermocouple. Replace the thermocouple to correct this condition.

ER 3 — **Temperature Calibration Error** — The computer has detected a problem with the temperature calibration. Contact Whip Mix Corporation for calibration instructions.

ER 4 — **Lift Calibration Error** — The computer has detected a problem with the lift calibration. Contact Whip Mix Corporation for calibration instructions.

ER 5 — **Vacuum Calibration Error** — The computer has detected a problem with the vacuum calibration. Contact Whip Mix Corporation for calibration instructions.

ER 6 — **Program Memory Error** — The computer has detected a problem with the memory that stores your programs. Check all your programs and correct any that have changed.

ER 7 — **Setup Error** — The computer has detected a problem with the special functions setup values. Check all special functions as described in **Chapter Four — Special Functions**.

ER 8 — **Maximum Temperature Error** — The furnace has run away to a temperature beyond the maximum allowed. Turn the power off and allow the furnace to cool. This error may indicate a bad thermocouple. Test the furnace by running a program. If it fails again, contact Whip Mix Corporation for instructions.

ER 12 — **Bottom Lift Fail Error** — The computer has detected an error with the bottom lift mechanism. The lift hasn't pushed the bottom limit switch after the allowed time. Contact Whip Mix Corporation for calibration instructions.

ER 13 — **Top Lift Fail Error** — The computer has detected an error with the top lift mechanism. The lift hasn't pushed the top limit switch after the allowed time. Contact Whip Mix Corporation for calibration instructions.

ER 14 — **Wrong Thermocouple Error** — This error only appears when performing auto-calibration. Contact Whip Mix Corporation for calibration instructions.

## Chapter Three — Entering and Editing Programs

Programs can be entered or changed while in the idle mode. Changes to a program currently running can also be made for the remaining stages of the cycle. The procedure for entering and editing a program is the same.

**Note:** Pressing the **Abort** button at any time while entering or editing a program will abort the procedure and the original program will not be changed.

### To Enter/Edit a Program

1. Press the **Program Edit** button, press **Enter** button. The LED light on the left will blink showing the program stage to be set. Use the keypad to enter the program parameters.
2. By pressing the **Enter** key, you will move to the next parameter in the program.
3. Press the **Last** button to scroll backwards through the program to verify or make changes.

**Note:** Pressing the **Last** button at the Start Temp (Entry Temp) while editing a program will set the temperature to zero.

### Changing a Program While it is Running

1. While a program is running, press the **Program Edit** button. The program number will be displayed in the two-digit display. The four-digit display will be blank.
2. Press the **Enter** button.
3. The light for the start temperature will flash. Use the numeric keypad to enter the new values and press **Enter** to continue.
4. Repeat this step for each of the remaining steps.
5. After the last value has been entered, the furnace will continue running the program with the new values. When the program has finished running, it will revert back to the original values.

### Available Program Parameters

**Start Temp** — The recommended range is 0° to 650° C (0° to 1,202° F).

**Pre Dry** — The lift will be raised in five evenly spaced steps during the programmed entry time. The time is entered in minutes:seconds. The acceptable range is from 0 to 60 minutes and seconds.

**Soak Time** — This is a preliminary low temperature soak. The acceptable range is from 0 to 60 minutes. The time is entered in minutes:seconds.

**Heat Rate** — The recommended range is 0° to 100° C (2° to 181° F) per minute.

**Final Temp** — The recommended range is the programmed below start temperature to 117° C (2,192° F).

**Hold Time** — The recommended range is from 0 to 60 minutes and seconds. The time is entered in minutes:seconds.

**Cool Time** — This is the time it takes to lower the lift from the upper position to the lower position. The lift will be lowered in five evenly spaced steps during the programmed cool time. The acceptable range is from 0 to 60 minutes. Time is entered in minutes:seconds.

**Vacuum Level** — The furnace can only run continuous vacuum. All programs are pre-set with vacuum on. To turn

vacuum off, press the **Zero** (0) button on the keypad. To add vacuum to a program, press any number **1–9** on the keypad.

**Start Time** — If vacuum is desired during the heat soak, you can enter a value from 0 (when the soak time starts) to end the time of the heat soak.

**Start Temperature** — Enter the temperature at which the vacuum will turn on. The recommended range is from Start Temp to Final Temp.

**Release Temp** — If vacuum is used in a program, it is necessary to enter a temperature at which the vacuum pump will turn off. The recommended range is from the programmed entry temperature to the final temperature of the program.

**Note:** Vac Release Temp (Vac Start Temp).

**Release Time** — If a program has a hold time, it is possible to hold vacuum during the hold time. If vacuum is not desired during the hold time, enter a value of zero (0).

After the last value has been entered, the program is stored in permanent memory.

**Note:** If an invalid entry is made while entering the parameters of a program, the furnace will play an error tune and set the display to zero (0).

## Chapter Four — Running a Program

### To Start a Program:

1. Press the **Program Select** button.
2. Use numeric keypad to enter the desired program number.
3. Press the **Start Program** button to begin the new program.


To run the program currently on the two-digit display, simply press the **Start Program** button.

When a program is finished, the four-digit display and the Program Finish LED will flash and the furnace will play a tune to let you know the program is finished. The furnace will automatically cool down to idle temperature at this time.


The display will stop flashing and be ready for the next input by pressing the **Enter** button.

The “program finished” tune can be customized to distinguish one furnace from another. See **Chapter Two — Special Functions** for details.

### Loading Your Work Into the Furnace:

Press the down arrow key  to lower the work platform. Place your work on the firing tray, Press **Start Program** key, and it will raise automatically under **program control**.

### Skipping a Program Step

Manually override a program step and skip to the next step by pressing the /Skip button.



**CAUTION: NEVER OPEN THE INTERIOR OF THE CHASSIS BEFORE FIRST REMOVING THE AC ELECTRICAL POWER CORD. THERE ARE DEADLY VOLTAGES INSIDE.**

## Chapter Five — Maintenance



**CAUTION: THE GASSES PRODUCED WHEN HEAT TREATING REFRACTORY MODELS WILL DAMAGE THE TRANSPARENCY AND STRUCTURE OF THE QUARTZ TUBES IN THE MUFFLE CHAMBER AND MAY CAUSE VACUUM LEAKAGE. TO HELP EXTEND THE LIFE OF THE MUFFLE, IT IS NECESSARY TO PREHEAT REFRACTORY MODELS IN ABURNOUT FURNACE TO PREVENT THE GASSES FROM DAMAGING THE QUARTZ GLASS IN THE MUFFLE CHAMBER.**

### Cleaning Your Furnace

Your new furnace has been painted with an epoxy-based paint and may be cleaned by using a soft cloth and mild kitchen cleaners such as Fantastic® or Formula 409®. The front panel should be cleaned with a window cleaner such as Windex®.

Never clean the display window with a dry cloth or tissue. Always moisten the cleaning cloth with a cleaner such as Windex®.

**Note:** If hazardous material is spilled on or inside the furnace, contact Whip Mix Technical Support if there is any doubt as how to safely remove the material.

### Replacing the Muffle

The FireLite furnace contains a muffle module designed for simple service and replacement. The muffle module contains the heating chamber and the thermocouple.

The replacement procedure is as follows:

1. Turn the power switch located at the rear of the furnace to the **off** position. Remove the power cord from the wall socket to prevent any chance of a shock hazard. Allow the furnace to cool.
2. Remove the six Phillips-head screws holding the muffle cover to the two upright brackets. Remove the muffle cover by lifting it straight up until it clears the upright brackets.
3. Remove the thermocouple connector from the column by squeezing the two tabs and pulling away from the column. Remove the heating element connector from the bracket by squeezing the two tabs and pulling away from the bracket. Remove the four large Phillips-head screws on the top of the muffle. Grasp the handle on the top of the muffle and lift vertically to remove the muffle from the vacuum chamber.
4. Inspect the O-ring for damage and replace if required. Clean the O-ring area and the sealing area of the new muffle with a mild cleaning solution such as Windex®. Lower the new muffle into the vacuum chamber with the thermocouple and the heating element connectors. These are keyed so it is not possible to plug them in incorrectly.
5. Repeat step 3 in reverse order, reinstalling the muffle screws and connectors.
6. Install the muffle cover by lowering it over the upright column and aligning the screw holes. Install the six Phillips-head screws that attach the muffle cover to the upright column.
7. Plug the power cord back into the wall socket and turn the power on. Observe that the temperature begins to rise and stabilize at the entry temperature of the current program.
8. Fire a chip of porcelain to test the firing temperature of the new muffle. Adjust the calibration as described in **Chapter Two — Adjust Furnace Calibration to Match Your Porcelain**.

## If More Help is Needed

We hope you have many years of trouble-free service from your furnace. If you do have problems with the furnace, or if you have questions about the furnace not covered in the manual, contact your dealer or Whip Mix at:

Phone: 800-626-5651

Fax: 502-634-4512

E-Mail: [movermeer@whipmix.com](mailto:movermeer@whipmix.com)

Or visit our web site at [www.whipmix.com](http://www.whipmix.com)

Be prepared to provide the following information:

1. Your name
2. Your lab's name and address
3. Your lab's phone number
4. Your lab's fax number
5. Furnace model and serial number (serial number can be found on the rear of the furnace)
6. Your question/problem

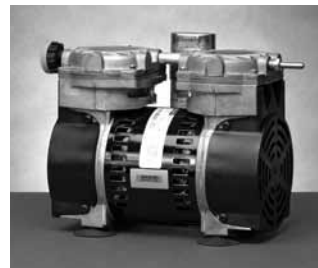
When you call, it would be helpful if you are near the furnace. The technician will probably ask you to run tests and report the results, or read the display while the test is running.

---

## Replacement Parts

Part Number	Description
96034	Muffle, 115 Volt
96312	Thermocouple
96286	Drive Motor
96287	Lift Cable
96288	Vacuum Valve Assembly
96070	Vacuum Valve Plunger
96289	Power Supply PCB
96290	Logic PCB
96025	Table
96291	Limit Switch Assembly
96293	Overlay
96294	Power Switch Assembly
96295	Speaker Assembly
96296	Vacuum Hose Assembly
96015	Alumina Firing Tray
96297	Cooling Shelf
96016	Fuse, 12 amp (115 Volt units only)
96017	Fuse, 6.3 amp (230 Volt units only)
96004	115 Volt Power Cord
96060	Pump & Heater SSR, 10 amp
96011	Rubber Feet
96302	Dry-Erase Program Log Magnet
IT11236	Operation Manual

## FireLite Accessory



**High Efficiency Vacuum Pump**

---

Manufactured and serviced at:

**Whip Mix Corporation**  
P.O. Box 17183  
Louisville, KY 40217-0183



## Fahrenheit to Celsius

° F	° C	° F	° C	° F	° C	° F	° C
100	38	630	332	1,160	627	1,690	921
110	43	640	338	1,170	632	1,700	927
120	49	650	343	1,180	638	1,710	932
130	54	660	349	1,190	643	1,720	938
140	60	670	354	1,200	649	1,730	943
150	66	680	360	1,210	654	1,740	949
160	71	690	366	1,220	660	1,750	954
170	77	700	371	1,230	666	1,760	960
180	82	710	377	1,240	671	1,770	966
190	88	720	382	1,250	677	1,780	971
200	93	730	388	1,260	682	1,790	977
210	99	743	393	1,270	688	1,800	982
220	104	750	399	1,280	693	1,810	988
230	110	760	404	1,290	699	1,820	993
240	116	770	410	1,300	704	1,830	999
250	121	780	416	1,310	710	1,840	1,004
260	127	790	421	1,320	716	1,850	1,010
270	132	800	427	1,330	721	1,860	1,016
280	138	810	432	1,340	727	1,870	1,021
290	143	820	438	1,350	732	1,880	1,027
300	149	830	443	1,360	738	1,890	1,032
310	154	840	449	1,370	743	1,900	1,038
320	160	850	454	1,380	749	1,910	1,043
330	166	860	460	1,390	754	1,920	1,049
340	171	870	466	1,400	760	1,930	1,054
350	177	880	471	1,410	766	1,940	1,060
360	182	890	477	1,420	771	1,950	1,066
370	188	900	482	1,430	777	1,960	1,071
380	193	910	488	1,440	782	1,970	1,077
390	199	920	493	1,450	788	1,980	1,082
400	204	930	499	1,460	793	1,990	1,088
410	210	940	504	1,470	799	2,000	1,093
420	216	950	510	1,480	804	2,010	1,099
430	221	960	516	1,490	810	2,020	1,104
440	227	970	521	1,500	816	2,030	1,110
450	232	980	527	1,510	821	2,040	1,116
460	238	990	532	1,520	827	2,050	1,121
470	243	1,000	538	1,530	832	2,060	1,127
480	249	1,010	543	1,540	838	2,070	1,132
490	254	1,020	549	1,550	843	2,080	1,138
500	260	1,030	554	1,560	849	2,090	1,143
510	266	1,040	560	1,570	854	2,100	1,149
520	271	1,050	566	1,580	860	2,110	1,154
530	277	1,060	571	1,590	866	2,120	1,160
540	282	1,070	577	1,600	871	2,130	1,166
550	288	1,080	582	1,610	877	2,140	1,171
560	293	1,090	588	1,620	882	2,150	1,177
570	299	1,100	593	1,630	888	2,160	1,182
580	304	1,110	599	1,640	893	2,170	1,188
590	310	1,120	604	1,650	899	2,180	1,193
600	316	1,130	610	1,660	904	2,190	1,199
610	321	1,140	616	1,670	910	2,200	1,204
620	327	1,150	621	1,680	916	2,210	1,210

## Celsius to Fahrenheit

° C	° F	° C	° F	° C	° F	° C	° F	° C	° F
35	95	300	572	565	1,049	830	1,526	1,095	2,003
40	104	305	581	570	1,058	835	1,535	1,100	2,012
45	113	310	590	575	1,067	840	1,544	1,105	2,021
50	122	315	599	580	1,076	845	1,553	1,110	2,030
55	131	320	608	585	1,085	850	1,562	1,115	2,039
60	140	325	617	590	1,094	855	1,571	1,120	2,048
65	149	330	626	595	1,103	860	1,580	1,125	2,057
70	158	335	635	600	1,112	865	1,589	1,130	2,066
75	167	340	644	605	1,121	870	1,598	1,135	2,075
80	176	345	653	610	1,130	875	1,607	1,140	2,084
85	185	350	662	615	1,139	880	1,616	1,145	2,093
90	194	355	671	620	1,148	885	1,625	1,150	2,102
95	203	360	680	625	1,157	890	1,634	1,155	2,111
100	212	365	689	630	1,166	895	1,643	1,160	2,120
105	221	370	698	635	1,175	900	1,652	1,165	2,129
110	230	375	707	640	1,184	905	1,661	1,170	2,138
115	239	380	716	645	1,193	910	1,670	1,175	2,147
120	248	385	725	650	1,202	915	1,679	1,180	2,156
125	257	390	734	655	1,211	920	1,688	1,185	2,165
130	266	395	743	660	1,220	925	1,697	1,190	2,174
135	275	400	752	665	1,229	930	1,706	1,195	2,183
140	284	405	761	670	1,238	935	1,715	1,200	2,192
145	293	410	770	675	1,247	940	1,724	1,205	2,201
150	302	415	779	680	1,256	945	1,733	1,210	2,210
155	311	420	788	685	1,265	950	1,742	1,215	2,219
160	320	425	797	690	1,274	955	1,751	1,220	2,228
165	329	430	806	695	1,283	960	1,760	1,225	2,237
170	338	435	815	700	1,292	965	1,769	1,230	2,246
175	347	440	824	705	1,301	970	1,778	1,235	2,255
180	356	445	833	710	1,310	975	1,787	1,240	2,264
185	365	450	842	715	1,319	980	1,796	1,245	2,273
190	374	455	851	720	1,328	985	1,805	1,250	2,282
195	383	460	860	725	1,337	990	1,814	1,255	2,291
200	392	465	869	730	1,346	995	1,823	1,260	2,300
205	401	470	878	735	1,355	1,000	1,832	1,265	2,309
210	410	475	887	740	1,364	1,005	1,841	1,270	2,318
215	419	480	896	745	1,373	1,010	1,850	1,275	2,327
220	428	485	905	750	1,382	1,015	1,859	1,280	2,336
225	437	490	914	755	1,391	1,020	1,868	1,285	2,345
230	446	495	923	760	1,400	1,025	1,877	1,290	2,354
235	455	500	932	765	1,409	1,030	1,886	1,295	2,363
240	464	505	941	770	1,418	1,035	1,895	1,300	2,372
245	473	510	950	775	1,427	1,040	1,904	1,305	2,381
250	482	515	959	780	1,436	1,045	1,913	1,310	2,390
255	491	520	968	785	1,445	1,050	1,922	1,315	2,399
260	500	525	977	790	1,454	1,055	1,931	1,320	2,408
265	509	530	986	795	1,463	1,060	1,940	1,325	2,417
270	518	535	995	800	1,472	1,065	1,949	1,330	2,426
275	527	540	1,004	805	1,481	1,070	1,958	1,335	2,435
280	536	545	1,013	810	1,490	1,075	1,967	1,340	2,444
285	545	550	1,022	815	1,499	1,080	1,976	1,345	2,453
290	554	555	1,031	820	1,508	1,085	1,985	1,350	2,462
295	563	560	1,040	825	1,517	1,090	1,994	1,355	2,471



## Other Products from Whip Mix Corporation



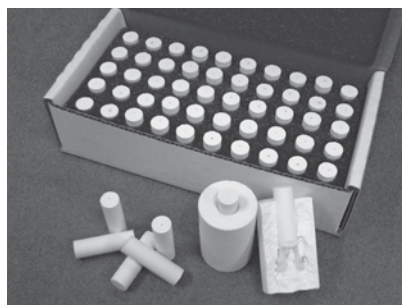
**Pro 200**



**Pro Press 200**



**Pro Check**



**Disposable Plungers**



**Formula 1**



**PC 15**