



# INSTRUCTION MANUAL

## REFLOW SOLDER MACHINE

### MODEL GF-B

### MODEL GF-B-HT (Lead Free High Temperature)

#### WARNING:

FAILURE TO READ AND FOLLOW THESE INSTRUCTIONS IN THEIR ENTIRETY PRIOR TO INSTALLATION AND OPERATION MAY VOID WARRANTY AND RESULT IN PERSONAL INJURY AND DAMAGE TO PROPERTY! Please pay particular attention to all items marked "CAUTION!" in manual. Be sure that all personnel who are to operate this machine are first fully familiar with this manual and are instructed on proper safety procedures, practices and precautions.

#### I. INSTALLATION

A. Carefully uncrate the machine and remove it from its pallet. Place it in a suitable location, allowing sufficient working area at the front and ends of the machine.

B. Attach leveling feet to machine and ensure that it is level

**CAUTION!** Feet must be attached to bottom of unit for ventilation purposes

C. Connect to appropriate electrical power source.

#### III. UTILITIES & SPECIFICATIONS

Electrical Power ..... 17A @ 208 VAC, 15A @ 220 VAC, 50/60 Hz, 1Ø, 2.7 kW  
Max Board Width .....12" x 12" (305 x 305mm)  
Overall Dimensions .....37" x 28" x 14.5" (940 x 712 x 368mm)  
Venting .....exhaust fan with 4" flange

#### NOTE:

Check all connections and carefully inspect entire machine and installation prior to start-up.

## IV. OPERATION

- A. Turn MAIN POWER switch ON.
- B. Press ENTER to start.
- C. Press ▲ or ▼ to scroll through mode selections.
- D. Press ENTER to select one of 4 available modes:
  1. SETUP
  2. PROFILE
  3. WORK
  4. TUNE
- E. SETUP mode: press ▼ or ▲ to change settings, use ◀ or ▶ to scroll through
  1. Auto: leave ON for normal operation (default mode); machine will cycle each time shuttle is moved to its opposite side, When Auto is OFF, operator initiates each cycle by pressing ◀ & ▶ simultaneously.
  2. Calib: turn OFF for normal operation.
  3. Temp: set to °F or °C.
  4. Press ENTER to exit SETUP mode.
- F. PROFILE mode: go to this mode first to choose menu # and settings. Use ◀ or ▶ to scroll through field, press ▼ or ▲ to change settings.
  1. Set profile "#": (from 1 to 50) **NOTE:** if you want to start WORK mode immediately, set #0 = GO which simulates WORK mode. Press ◀ & ▶ to go right into WORK mode (see sec. G-7).
  2. Set temperature "T": ( from 100 to 450°F) Typical temperature settings for standard Sn63/Pb37 solder paste is 430°F (220°C).
  3. Set "t<sub>a</sub>" = preheat/activation time for Sn63/Pb37 ( Typically 60-90 sec).
  4. Set "t<sub>b</sub>" = total cycle time for Sn63/Pb37 (Typically 240 sec).

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5. Set temperature "T": ( from 100 to 662°F) Typical temperature setting for lead-free solder paste is 482°F (250°C).
6. Set "t<sub>a</sub>" = preheat/activation time for lead-free ( Typically 75-120 sec).
7. Set "t<sub>b</sub>" = total cycle time for lead-free (Typically 240-300 sec).
8. Set "s" (seconds) or "m" (minutes).
9. Press ENTER to exit PROFILE mode.

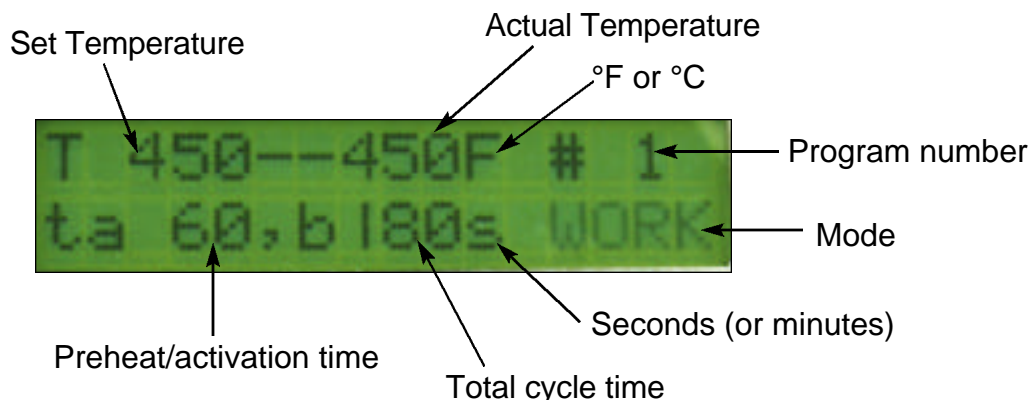


Fig. 1 LCD WORK mode

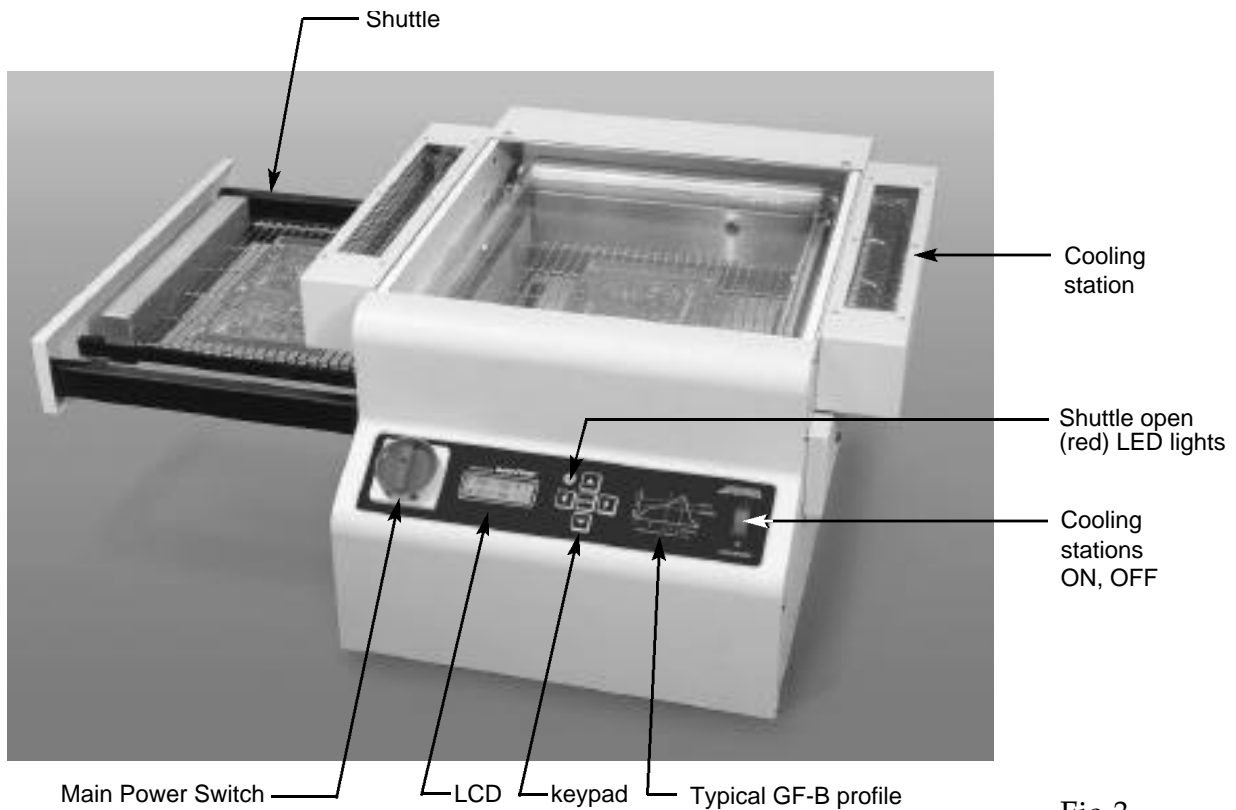


Fig.3



Fig.4

G. WORK mode: Used to turn oven on and operate it after profile menu number is chosen. “ $t_a$ ” and “ $t_b$ ” can be increased in WORK mode on-the fly.

- Initial Heat-up
1. Press ENTER and menu from last profile will appear
  2. Move shuttle completely from one side to the other once, heaters will turn on. Allow to preheat for approximately 30 to 35 minutes.
  3. Place board on shuttle.
  4. Move shuttle to opposite side,  $t_a$  and  $t_b$  will cycle completely and beep when done (WORK mode on LCD will blink) signaling operator to shuttle board to cooling station. Let board cool. **While oven is cycling, operator should remember to place unprocessed board(s) each time before shuttling.** (Timers will automatically start again for the next PCB each time board is shuttled)

**CAUTION: Do not leave PCB unattended in heat chamber after cycle is finished. as chamber remains at set temperature after cycle is complete.**

**IMPORTANT: Do not shuttle part way, (red LED will light), heaters will turn off.**

6. You can increase time in  $t_a$  and  $t_b$  by pressing ▲ during each individual cycle. To stop the increase setting press ▲ again. (this is “on-the fly” setting)
  7. MANUAL MODE. (when AUTO is turned OFF in SETUP mode you can manually cycle machine, after switching back to WORK mode)
    - a. Move shuttle to ON position (full left or full right position).
    - b. Press ◀ and ▶ simultaneously, machine will cycle one time and beep when done (WORK mode on LCD will blink) signaling operator to shuttle board to cooling station. Let board cool. Remember to place new board before shuttling.
    - b. Press ◀ and ▶ simultaneously and machine will cycle once again.
- HINT: while in WORK mode you can view bottom heater temperature by pressing and holding ◀▲▶ and ENTER keys simultaneously, press again to exit. (used mainly just to check)
8. Press ENTER to exit WORK mode.

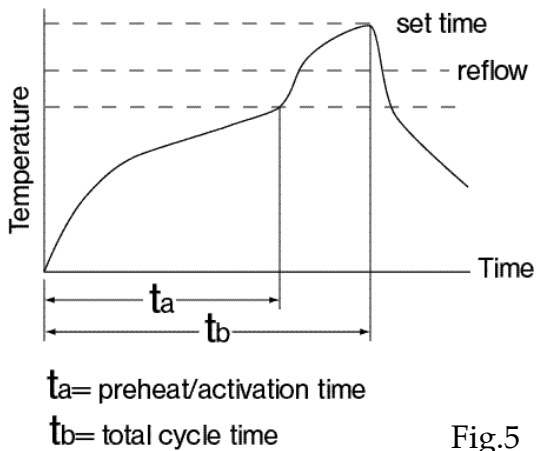


Fig.5

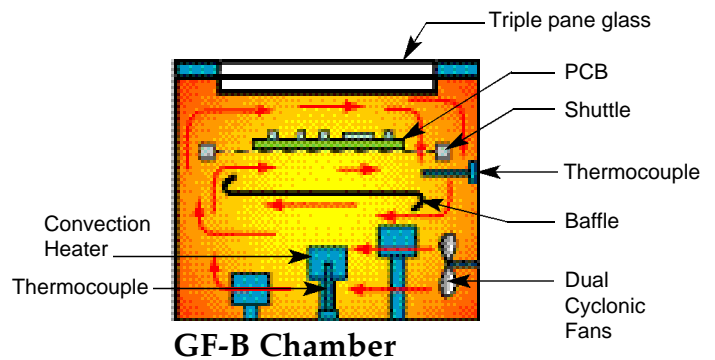


Fig.6

H. TUNE mode: Used for temperature calibration and for tuning machine  
**Oven has been pre-tune at factory, consult with factory technician before attempting**

- |             |   |  |
|-------------|---|--|
| Calibration | { | 1. Press ENTER (“enter code” appears on LCD).  |
|             |   | 2. Press code ▲ ▼ ▶ simultaneously to achieve TUNE mode.   |
|             |   | 3. Press ▶ key to choose <b>calibration</b> mode. <b>Calibrate only when oven is “cold”</b>  |
|             |   | 4. To calibrate machine: set ambient (room) temperature by using ▲ ▼ keys.   |
|             |   | 5. Press ◀ and ▶ simultaneously to execute calibration parameters (there is an audible “beep” and “DONE” appears on LCD, meaning calibration is done).   |
| Tuning      | { | 6. Press ENTER to exit TUNE (calibration) mode, <b>*or if you need to tune machine:</b>  |
|             |   | 7. Press ▶ repeatedly until START appears (blinking).  |
|             |   | 8. Press ◀ and ▶ simultaneously to execute tuning of machine (this will take 30 to 60 minutes). There is an audible “beep” and “TUNE DONE” appears on the LCD, meaning tuning of machine is done). |
|             |   | 9. To exit TUNE mode, press ENTER.   |

**CAUTION: To avoid overheating the convection heating element, DO NOT exceed 3 minutes of preheat/activation ( $t_a$ ) time**

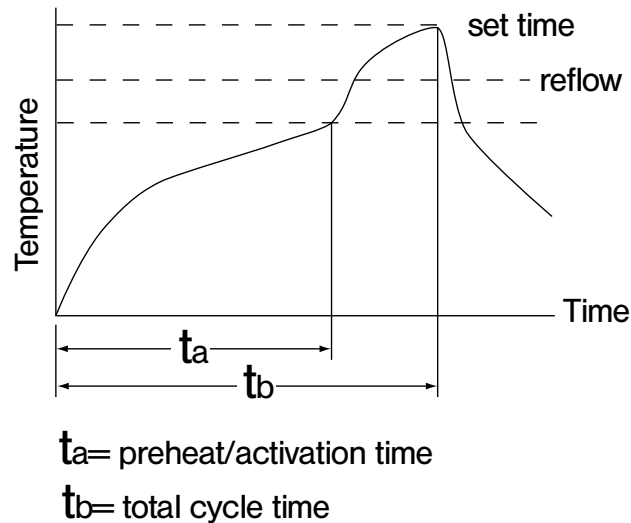


Fig.5

**CAUTION:** To avoid overheating the convection heating element, **DO NOT** exceed 3 minutes of preheat/activation ( $t_1$ ) time

## V. NITROGEN OPERATION

1. Connect room temperature nitrogen to fitting at rear of flow meter.
2. Turn flow meter knob counter-clockwise until the floating steel ball in the meter indicates the desired nitrogen volume. (300 SCFH is a recommended starting point).
3. To **decrease** the O<sub>2</sub> PPM level, **increase** the nitrogen volume.  
To **increase** the O<sub>2</sub> PPM level, **decrease** the nitrogen volume.
4. The oven must be purged with nitrogen for a minimum of 10 minutes prior to soldering.
5. **IMPORTANT:** When soldering is completed, it is important to turn off flow meter in order to stop the flow of nitrogen.

