

# BPI® Custom Heat Temp™

For use only by qualified personnel in a laboratory environment.

Due to high operating temperature, access should be restricted.

## Specifications

The BPI® Custom Heat Temp™ is a computer-controlled device for tempering glass parts. It allows you direct control over the temperature of the oven and the time spent by the lenses under heat, or completely automatic operation according to the type and thickness of the glass. IMPORTANT! NEVER REMOVE GROUND PRONG FROM POWER PLUG AS IT ENSURES SAFE ELECTRICAL OPERATION.

## Unpacking

When unpacking your tempering system, please check to ensure that no concealed damage occurred in transit. If such is noted, save the shipping carton and immediately notify the shipping company's damage control inspector in your area so a claim may be processed. Failure to do this may void any future claim and replacement. Also, call BPI® Customer Service so arrangements for a replacement may be made.

## Operation

### Step 1

Turn the oven on by means of the front panel power switch. At this time, the OVEN light should come on, indicating that the heating element is getting power; the digital display should begin indicating temperature inside the oven chamber in degrees Fahrenheit. (The thermometer was not designed for accuracy at room temperature.) The temperature should continue to increase until it reaches approximately 1110° F. (about 20-30 minutes, starting from room temperature).

You will find the following items on the white front panel of the oven:

- the main power switch,
- a key pad, used for entering commands to the computer,
- a liquid-crystal display, which shows the temperature of the oven, the time remaining in a tempering cycle,
- a neon light which indicates that the heating element is under power,

HEIGHT	WIDTH	LENGTH	VOLTAGE	WEIGHT	FUSE	AMPERAGE
19 in.	12 in.	33 in.	220v	45 lb	20 amps. 250v.	10 amps.
48.3 cm	30.5 cm	83.8 cm		20.4 kg		
THE SET-UP KIT INCLUDES THE FOLLOWING PRODUCTS:						
• 1 Instruction Manual						

(e) a RESET button which will immediately cancel any tempering cycle which is in progress, pull the tray out of the oven and load the default tempering parameters (program 1, 3.2 mm. thickness and 1110° F. set point).

### Step 2

When the temperature has reached its set point and stabilized (the neon lamp will flicker rapidly and the net variation of the temperature indicator will be about +/- 10° F), select a tempering sequence. Parts are tempered by subjecting them to a steady heat which softens the glass all the way through just short of melting, and then cooling them rapidly in such a way that the outer skin of the glass hardens before the interior, thus setting up stresses which compresses the surface layer of the glass and make it resistant to shock. In selecting a tempering sequence, you are in effect choosing the temperature of the oven and the time the parts are exposed to that temperature. This may be accomplished by telling the computer directly the time and temperature, or by selecting a program for the type of part being used and the thickness of the part.

## Setting The Temperature

Press the TEMP button on the keypad. The display will show the temperature for which the thermostat is currently set (default temperature is 1110° F.) If the temperature displayed is satisfactory, press ENTER. If not, type in the desired temperature. If you make a mistake, just keep entering digits until the display is correct. When you have entered the correct temperature, press ENTER. The desired temperature will be set into the thermostat and the display will return to showing the temperature currently in the oven. At the time of assembly, the temperature measuring mechanism was set so that ordinary parts would be tempered normally at 1110° F. However, over a period of time, the calibration of

the unit may change. Rather than submit the machine to a time-consuming re-calibration, it may be easier to change the set temperature of the thermostat. Under normal conditions, the oven is at the correct temperature when the coils inside the chamber are a dull reddish-orange color. More accurate measurements may be made with an external high temperature thermometer

## Selecting The Lens Thickness

Press the THICK key. The display will show the currently selected parts thickness in tenths of a millimeter. The default thickness, chosen when the oven is turned on or any time the reset button is pressed, is 3.2mm. If the thickness displayed is correct, press ENTER. If not, enter the desired thickness in tenths of a millimeter and press ENTER. Any time you use the PROG or THICK keys, the computer uses the numbers selected to calculate the heating time.



BPI® Custom Heat Temp™

## Starting The Tempering Cycle

Put one or two parts on the tempering tray. If only one part is being tempered, it should be put on the left or right side of the tray rather than in the middle so that when the fan is turned on, the air flow will be directed to the center of the part.

Press the START button. The tray will be drawn into the oven.

From the time that the START button is pressed until the tempering cycle is finished, the only keys on the pad that will have any effect are TIME and TEMP. If you press the TIME key, the display will show the amount of time remaining in the tempering cycle. If you press TEMP, it will show the current temperature inside the oven. If it is necessary to abort the tempering cycle at any time, press the reset button in the middle of the front panel. This will bring the tray out of the oven without turning on the fan and reload the default program parameters.

When time runs out for the heating portion of the cycle, the tray is pulled out of the oven, and the fan is turned on for a period of time based on the length of the heating cycle. It is this cooling period which actually causes the lens to be tempered.

After the part has cooled, check it with a polariscope. A completely untempered part will have no apparent effect on polarized light, and the field will remain completely blue. However, a properly tempered part is full of internal stress, which causes it to rotate the plane of polarization of a beam of light, creating a pattern of light and dark in the polariscope field. This pattern will appear to be inside the part, and yet, when you rotate the part, the pattern will remain nearly stationary, twisting and shifting, but not bound to the part. If, at any time, you need to cancel the tempering process, either to get the parts out of the oven or to turn off the blowers, press the reset button. The computer will immediately stop what it is doing, pull the tray out of the oven and turn off the fan. You may begin programming before the tray is completely out, if you wish.

## Choosing A Program

### Program 0 Fan Only

When the parts are brought out of the oven after a normal tempering cycle, a fan blows slightly heated air on the upper and lower surfaces to cool the outside rapidly. If you select program 0 and press START, the fan will blow again for the period of time determined by the most recently selected program. This may be useful for final cooling of the parts to avoid burning your fingers, or if you want to delay the cooling air when tempering thick parts.

### Program 1 Standard 3.3 mm ISUZU GLASS

The parts are softened by a mixture of radiant and convective heating. Since the parts are clear, the radiant heat has very little effect on them, and they must be left in the hot air long enough for the heat to penetrate the entire part.

### Program 2 ISUZU parts thicker than 4 mm .

A longer time is required and more gentle pulsed air blast is used for stressing the part.

### Program 3 ISUZU parts thicker than 5 mm.

A still longer heating time is required with even more gentle pulse air cooling

## Setting Time Manually

At this time, no program number higher than 3 is accepted. As revisions to the tempering program are made, new program cycles may become available. If you want to control the heating time yourself, press the TIME key. The currently selected tempering time will be displayed. If it is correct, press ENTER. Otherwise, enter the time you want in minutes and seconds, up to a limit of 19:59. Please note that in order to control time manually, the TIME key must be the last one that you use before starting the cycle. If either the PROG or THICK keys are pressed, the computer will re-compute time based on the selected glass type and thickness.

## Questions? Ordering...

If you have any questions, or to order please give us a toll-free call using the number for your area.