BPI Computer Heat Temp II ™

For use only by qualified personnel in a laboratory environment.

Due to high operating temperature, access should be restricted.

Specifications

The BPI Computer Heat Temp II™ is a computer-controlled device for tempering glass lenses. 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 1080° F. (about 20-30 minutes, staring from room temperature).

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

(a) the main power switch,

(b) a key pad, used for entering commands to the computer,

(c) a liquid-crystal display, which shows the temperature of the oven, the time remaining in a tempering cycle,

(d) a neon light which indicates that the heating element is under power,

HEIGHT	WIDTH	LENGTH	VOLTAGE	WEIGHT	FUSE	AMPERAGE
18 in.	13.5 in.	12 in.	110v or 220v.	78 lbs.	20 amps. 250v.	10 amps.
45.72 cm	34.29 cm	30.48 cm		35.38 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 (crown glass lenses, 3.2 mm. thickness and 1080° F. set point). The polariscope (the white box mounted on the side of the oven) has a separate rotating power switch mounted on the back of its box. The light should be left off when not in use to prolong the life of the bulb and the polarizing material.

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. Lenses 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 lenses 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 glass being used and the thickness of the lens.

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 1080° 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 lenses would be tempered normally at 1080° 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 by a set of pyrometric cones, available from BPI. Also, you may want to change the temperature setting when tempering "difficult" lenses - some lenses which are damaged by the normal tempering cycle may be satisfactorily tempered with less risk of breakage by lowering the temperature of the oven. This can only be determined by experiment.

Selecting The Lens Thickness

Press the THICK key. The display will show the currently selected lens thickness in tenths of a millimeter. The thickness of the lens must be chosen in such a way that the thickest parts of the lens (the center on positive lenses, the edges on negative lenses) will be thoroughly heated, and yet the thinnest parts of the lens will not be overheated, causing them to sag under their own weight. In order to do this, we suggest that you

TIME IN OVEN				
Average Thickness	Crown Glass	Ray Ban 3	Photo Gray	Photo Gray Xtra
2.0	3.8	2.1	3.3	3.0
2.2	3.9	2.1	3.4	3.1
2.4	4.0	2.1	3.5	3.2
2.6	4.0	2.1	3.5	3.2
2.8	4.1	2.1	3.6	3.3
3.0	4.2	2.2	3.7	3.4
3.2	4.3	2.2	3.8	3.5
3.4	4.4	2.2	3.9	3.6
3.6	4.4	2.2	3.9	3.6
3.8	4.5	2.2	4.0	3.7
4.0	4.6	2.2	4.1	3.8
4.2	4.7	2.2	4.2	3.9
4.4	4.8	2.2	4.3	4.0
4.6	4.8	2.3	4.3	4.0
4.8	4.9	2.3	4.4	4.1
5.0	5.0	2.3	4.5	4.2
5.2	5.1	2.3	4.6	4.3
5.4	5.2	2.3	4.7	4.4
5.6	5.2	2.3	4.7	4.4
5.8	5.3	2.3	4.8	4.5
6.0	5.4	2.4	4.9	4.6
6.2	5.5	2.4	5.0	4.7
6.4	5.6	2.4	5.1	4.8
6.6	5.6	2.4	5.1	4.8
6.8	5.7	2.4	5.2	4.9
7.0	5.8	2.4	5.3	5.0
7.2	5.9	2.4	5.4	5.1
7.4	6.0	2.4	5.5	5.2
7.6	6.0	2.5	5.5	5.2
7.8	6.1	2.5	5.6	5.3
8.0	6.2	2.5	5.7	5.4

enter the average of the thickest and thinnest measurements of the lens. A little practice will allow you to estimate thickness in millimeters with sufficient accuracy. 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.

Starting The Tempering Cycle

Put one or two lenses on the tempering tray. If only one lens 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 lens. 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 pannel. 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 lens has cooled, check it with the polariscope. A completely untempered lens will have no apparent effect on polarized light, and the field will remain completely blue. However, a properly tempered lens 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 lens, and yet, when you rotate the lens, the pattern will remain nearly stationary, twisting and shifting, but not bound to the lens. If, at any time, you need to cancel the tempering process, either to get the lenses 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 find that the oven continues to make a grinding noise after the tray is completely pulled out. this is normal and is due to the fact that after RESET is pushed, the computer has no way of knowing where the tray is; hence, it assumes that tray is completely inside the oven and turns the motor far enough to bring it out. You may begin programming before the tray is completely out, if you wish.

Choosing A Program

Program 0 Fan Only

When the lenses 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 lenses to avoid burning your fingers, or if you want to delay the cooling air when tempering thick or highly corrected lenses.

Program 1 Crown Glass

By crown glass we mean lenses which are completely clear - no dyes have been added to absorb light. The lenses are softened by a mixture of radiant and convective heating. Since crown glass lenses 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 lens.

Program 2 Ray-Ban™

RayBan™ is a dyed sunglass which absorbs light and heat readily. Therefore, the radiant heat of the oven will heat the entire bulk of the lens simultaneously, and the lens must be brought out of the oven quickly to prevent it from overheating, as reflected by the times in the chart. We recommend this program for any highly colored glass.

Program 3 Photo-Gray

Photo-Gray lenses have a certain amount of internal coloration which makes them absorb radiant heat faster than crown glass, though not so fast as the highly colored RayBan™ lenses.

Program 4 Photo-Gray Extra

This program is used just like Program 3, and takes into account the different amount of internal coloration of the Photo-Gray Extra lenses.

Setting Time Manually

At this time, no program number higher than 4 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.

MANUAL FILE# M2017

BPI# 16200 (115v)
BPI# 21620 (220v)