

# BPI<sup>®</sup> Production Computer Gradient™

For use only by qualified  
personnel in a  
laboratory environment.

Due to high operating  
temperature, access  
should be restricted.

## Specifications

The BPI<sup>®</sup> Production Computer Gradient™ uses microprocessor technology to make precision lens coloring easy. The operator can select from four programs to create gradient and solid lenses as well as special effects. The gradient is controlled by the computer to create consistent results like never before possible.

The BPI<sup>®</sup> Production Computer Gradient™ also provides the fastest method available anywhere for producing solid tints. The constant motion of the lens in the dye solution helps keep pigments and/or coating solutions in suspension.

HEIGHT	WIDTH	LENGTH	VOLTAGE	WEIGHT	FUSE	AMPERAGE
19 in.	9 in.	12 in.	115 or 220 v.	10 lbs	1 amp/250v.	1 amp
48.26 cm.	22.56 cm.	30.48 cm.		4.54 kg		
THE SET-UP KIT INCLUDES THE FOLLOWING PRODUCTS:						
• One BPI <sup>®</sup> Gradient Stand			• One BPI <sup>®</sup> Rack Holder			

## Unpacking

When unpacking your gradient 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<sup>®</sup> Customer Service so arrangements for a replacement may be made.

## Setting Up

Fit the 16" stand (pole) into the gradient opening on the top of the unit. A mounting flange is provided in cases where there is no gradient opening on the dye system. (Most BPI<sup>®</sup> systems of recent manufacture have a gradient opening). Use the flange to mount the gradient either directly onto the work counter or onto a piece of plywood or similar material which can then be slid underneath the dye system. The weight of the dye system will hold the gradient in place. It is important in all cases that the dye system be LEVEL.

The computer cable runs from the gradient head and plugs into the control box. It should plug in easily when correctly aligned. The on/off switches on the head allow either head to be disabled while the other is adjusted to keep the racks level.

At the back of the control box are a fuse holder (with a 2 amp fuse) and the ON/OFF switch. The electrical cord that runs from the back of the control box can be plugged into the receptacle at the back of your BPI<sup>®</sup> lens coloring system or into any standard 115 volt outlet.

## Using The Gradient

On turn-on, the gradient executes a 6 second test program to check lights, display, and the gradient head. The microcomputer is programmed by pressing the buttons to produce the desired results. The functions of program, time, and size can be entered in any order.

When in the ADJUST MODE, the UP and DOWN buttons are used to adjust the starting position of the lens holder so that the bottom edge of the lens is about 1/4" above the surface of the dye. We recommend that you first adjust the L-rod to get the lens into approximate position and then use the UP and DOWN buttons to make fine adjustments in height. The gradient arm should be started about 1" from the top of its slot to leave room for its motion.

Due to evaporation, the dye level will change somewhat from one operation to another, so it will probably be necessary to make occasional adjustments in the starting height of the arm. It is advisable to add water to the dye from time to time to bring the level back up to a convenient height for the gradient.

Use the MODE button to move to TIME. TIME is programmed by pressing UP or DOWN to raise or lower time value. Enter in minutes and seconds the time you want to spend making gradient-tinted lenses. When you move to TIME, the currently selected time will be displayed. You may then change it by entering a new time (up to 19 minutes and 59 seconds) or keep it by moving to other functions.

Use MODE to move to SIZE. SIZE is programmed by pressing UP or DOWN to increase or decrease the vertical size in millimeters to match the lens to be tinted. Lenses from 10 to 80 mm. in vertical dimension can be accommodated.

Use the MODE button to move to PROGRAM. The PROGRAM is selected by pressing UP or DOWN to the desired program number (0 through 4). Each program produces a gradient with a characteristic density curve, differing from one to the next in the degree of contrast between the bottom and the top of the lens. The minimum times mentioned are for 50 mm lenses.

Each program has a certain minimum time associated with it, which is proportional to the size of the lens. If you program a time less than this, the computer will execute the selected program exactly once at the fastest possible speed.

Since it takes longer to dip a large lens than a small one, you will notice that some programs which run properly at one time setting will refuse to run when the lens size is increased. The minimum time for a program depends on the size of the lens. All of the minimum times stated in this manual have been calculated for a lens of 50 mm.  $\text{New Time} = (\text{Standard Time}) \times (\text{New Size}) / (50)$

## Countdown

You may, if you measure the execution time of the program, find that it runs a bit longer than the time you have entered on the key pad. This is because the computer's time estimate is based only on the active part of the program, not on the time spent moving the lens into or out of the solution. The BPI<sup>®</sup> Production Computer Gradient™ displays how much time remains in the cycle. After the START button is pushed, the display will show total execution time and proceed to count down.

**NOTE: The execution time displayed for a given program may not be exactly the requested time, as the internal computer calculates the cycle execution time based upon all of the parameters entered.**

The START function button causes the computer to begin its calculations and initiate execution of the selected program. While the program is running, the red lights on the front panel will be out to let you know that it is working, even if you cannot see any motion. A red light on the control panel will be on when the computer is waiting for input to some function. When it is running a cycle, all lights will be off.

## Programs

**Program 0: Solid.** In this program, the operator enters the amount of time for the lens to be immersed in the dye. The computer dips the lens into the solution at high speed and then agitates it up and down by a few millimeters so that the fluid touching the lens is always at full strength. This is the fastest procedure available for dyeing a lens a solid color. There is no minimum cycle time, since the lens bobs up and down until the requested time expires.

**Program 1: Parabolic.** This program produces a lens in which the characteristic time-distance curve is parabolic. In general, a parabolic program cycle produces a higher contrast gradient than a linear cycle, but not so much as the cubic cycle described below. Minimum execution time for this program is about 48 seconds.

**Program 2: Parabolic - Lower Light.** This program has the same general features as number 1 but differs in that the lens dips more quickly at the end of the cycle, thus producing a smoother fade between the clear and colored part of the lens.

**Program 3: Cubic.** This program produces gradients whose time-distance curves are cubic in shape. It produces the most clearly visible gradients of any in this series and creates a subjective impression that the "turning point" between dark and light is nearer the dark side of the lens. In order to achieve the characteristic gradient, the motor will come to a complete stop from time to time. This is a normal part of the procedure. Minimum execution time for this program is about 2 minutes, 45 seconds.

**Program 4: 4-Stroke.** This program emulates a conventional 4-stroke (cam type) gradient. It has certain special features that make the appearance of a line (such as occurs in cam type gradients) less noticeable.

**Program 5:** Similar to programs 1 and 3 but suitable for longer timed gradients. Program starts more quickly and stops more gradually. It produces a uniformly dark top with less gradient at the bottom. There is a fast dip at the end to minimize line formation.

**Program 6:** Similar to program 5 but less aggressive.



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