

# BPI<sup>®</sup> Cuvette Spectrometer<sup>™</sup> (with RS-232 Port)

For use only by qualified personnel in a laboratory environment. For maximum protection against UVA energy, wear UV safety glasses & avoid looking directly at UV light source.



## Display

VIS 30	RED 25	YELLOW 26
UV 18	GREEN 32	BLUE 3

### TRAFFIC SIGNAL SAFETY DISPLAY

This analyzer has also been designed to determine if tinted lenses meet EC standards for traffic signal safety as outlined in ISO 14889, ISO DIS 8980-3 and ISO 13666. The numbers displayed are the Q numbers for the color.

5 Filter Level LED's are located on the left of the instrument.

One LED comes on and stays on. This indicates the filter level that the lens has achieved. (There is no violation of the safety standards).

Flashing LED. A flashing LED indicates a safety standard violation. The LED will start to flash and an asterisk (\*) appears next to the reading that is out of range.

## Specifications

The BPI<sup>®</sup> Cuvette Spectrometer<sup>™</sup> with RS-232 port (BPI#19502) is an invaluable aid for quality control of lenses tinted with visible light treatments. The meter may be used for fashion tint control and for critical density adjustments on therapeutic tints such as BPI Diamond Dye<sup>™</sup> 500/550 and Diamond Dye<sup>™</sup> 540. It may also be used to check for UVA blocking. It may also be used for traffic signal color density checks, and general filter level checks. In reflection mode, it will compare pigments on flat surfaces.

Variations in density and hardness of CR-39<sup>®</sup> lenses typically affect the ability to accept dye. Two lenses that have been in the same dye tank the same amount of time may not come out with the same tint - either in density or color balance.

One of the meter's digital displays indicates the Q percentage of light passing through a lens in the red (610nm), yellow (580nm), green (558nm), and blue (470nm) range. It also displays a white light (visible) reading as well as a UV reading. The second display give the L\*, a\* and b\* color values (CIE Lab) for the lens. L\* is the brightness, a\* is the red-green value and b\* is the blue-yellow value for the lens. It is a quick and accurate way to check the transmission characteristics of lenses.

The system power pack requires 115 volt, 50/60 Hz. Components are UL and C SA recognized.

**NOTE:** Always use the ground wire on the power cord for safe operation; do not ever bypass it.

HEIGHT	WIDTH	LENGTH	VOLTAGE	WEIGHT	FUSE	AMPERAGE
4 in.	6.5 in.	9.5 in.	115 or 220 v.	6 lbs	Impedance protected power supply	1 amp
10.1 cm	16.5 cm	24.1 cm		2.72 kg		
LENS CLEARANCE		TEST RANGE	THE SET-UP KIT INCLUDES THE FOLLOWING PRODUCTS:			
0.75 in.		350 nm to 400 nm (UVA) 400 nm to 700 nm (Visible)	• Instruction manual		• Patient brochures	
19.05 mm			• Power pack		• Patient brochure stand	
			• Cuvette		• RS-232 cable	
			• Cuvette holder		• Reflection standard	

## Unpacking

When unpacking your instrument, 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

To set up your BPI<sup>®</sup> Cuvette Spectrometer<sup>™</sup> with RS-232 port, just connect the power pack to a standard outlet convenient to your work area but away from the immediate vicinity of the lens coloring operation. Although BPI's meters are stable and sturdy, they may be adversely affected by excessive humidity and heat.

## Operation

1. The meter has REFLECTION/TRANSMISSION, CALIBRATE and READ buttons. Turn the unit ON by plugging in.
2. When this unit has stabilized, remove all lenses and press READ. Your unit is now calibrated. Press READ again and you should get readings of approximately 100% for all color channels. If not, press CALIBRATE and re-calibrate.
3. Place the lens to be tested in the light aperture (see picture of unit for example), press READ and the transmission readings will appear. The LED's on the left will indicate the filter level and will flash when a color whose level is unacceptable for traffic signal purposes is detected. Lenses with moderate to high power may cause erroneous readings.
4. Several hours after calibration the unit will shut itself off. Push the CALIBRATE button and you are back to step 2.
5. For cuvette readings, place the cuvette holder and cuvette in the light aperture. The unit must then be re-calibrated before readings are taken.

6. For reflection measurements, place the switch in REFLECTION mode, hang the white reflection calibration plate in the light aperture, and re-calibrate the unit.
7. In the event of any display or computer malfunction, press CALIBRATE to restore normal operation.

The RS-232 port and the cable are designed to interconnect the BPI<sup>®</sup> Cuvette Spectrometer<sup>™</sup> with a PC. A CD-ROM is supplied with the unit to allow them to communicate.

## PC System Requirements

System requirements: IBM PC-compatible computer. 486 processor or better. 12 MB memory. 5 MB disk space. RS-232 serial port. SVGA (800 x 600) display, preferably color. Mouse or other pointing device. CD-ROM drive. (For installation). Windows 95/98, or NT 4.0.

## Installation of Software:

- Insert the CD-ROM into the CD-ROM drive
- From the START menu, select RUN
- Enter (CD-ROM drive letter):setup.exe.

Choose OK and follow the instructions in the installation program. Re-booting may be necessary to complete the installation. 'READ' and 'RESET' may be executed from your PC. All information can be saved and printed out to your PC's printer.

## Note

The UV reading is 100% of the upper 31% of the 315 to 380nm near UV range. To obtain an approximate value for that range multiply the UV reading by .31.

## Filter Levels (EUROPE)

This Analyzer has **also** been designed to determine if tinted lenses meet EC standards for traffic signal safety as outlined in ISO 14889, ISO DIS 8980-3 and ISO 13666.

5 Filter Level LED's are located on the left of the instrument.

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Flashing LED indicates a safety standard violation.

## Replacement Parts

Visible Lamps: BPI#60302

ISO/DIS 8980-3. Categories for luminous transmittances and the related permissible transmittances in the ultraviolet solar spectral range				
CATEGORIES	VISIBLE SPECTRAL RANGE		ULTRAVIOLET SPECTRAL RANGE	
	From over	To	Over 315nm to 380nm UV-A	Over 280nm to 315nm UV-B
0	80%	100%	$T_v$	$T_v$
1	43%	80%	$T_v$	0.125 $T_v$
2	18%	43%	$T_v$	0.125 $T_v$
3	8%	18%	0.5 $T_v$	0.125 $T_v$
4	3%	8%	0.5 $T_v$	1.0% absolute
ISO 14889. Relative visual attenuation quotient for signal light recognition				
Spectacle lenses conforming to ISO 14889 for daylight and night use shall have a relative visual attenuation quotient Q of not less than:				
RED	0.8 (80% of the visible light transmission)			
YELLOW	0.8 (80% of the visible light transmission)			
GREEN	0.6 (60% of the visible light transmission)			
BLUE	0.4 (40% of the visible light transmission)			

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