**Introduction**

The spectrophotometer is a simple-to-use UV/visible instrument with a CCD array detector. It also has moving parts, which is the basis of the rapid scanning operating system.

**Operation**

DNA:

1. Press 1 to select DNA mode.

2. Select path length using the left and right arrows. Options are 5 or 10 mm. Press the down arrow.

3. (Dilution factor known) Enter the dilution factor using the keypad numbers. Range 1.00 to 9999. Use the C button to backspace and clear the last digit entered. Or (calculate dilution factor) Press View to enter the dilution factor screen (see second parameter screen to the left). Enter the volume of the sample using the keypad numbers. Range 0.01 to 9999. Press the down arrow. Enter the volume of the diluent using the keypad numbers. Range 0.01 to 9999. Press to calculate the dilution factor and return to the Parameters screen. OR Press to cancel the selections and return to the Parameters screen.

4. Select whether the background correction at 320 nm is used or not with the left and right arrows. Press the down arrow.

5. Select the units of measurement using the left and right arrows. Options: μg/ml, ng/μl, μg/μl. Press the down arrow.

6. Enter the factor using the keypad numbers. Default value is 50, range is 0.01 to 9999.

7. Press OK to enter the Results screen. OR Cancel to return to the initial display screen. Results Screen

8. Insert the reference sample. Press 0A/100%T Key. This will be used for all subsequent samples until changed.

9. Insert sample and press OK. This measures at the selected wavelengths and displays the results. The ratio of wavelengths 1 and 2 absorbencies are calculated (both corrected by the background wavelength value if selected). Gives concentration based on absorbance at wavelength 1.

1. Repeat step 9 for all samples.
2. Press to return to the initial display screen.

To do this procedure with RNA, simply select RNA instead of DNA on the first step.

Measuring Absorbance/Concentration

This application has two functions:

1. makes simple absorbance (A) measurements on samples, measuring the amount of light that has passed through a sample relative to a reference (this can be air).

 2. Makes simple concentration measurements on samples, by measuring the amount of light that has passed through a sample relative to a reference (this can be air). Concentration is obtained by multiplying the measured absorbance at a specific wavelength by a factor. The factor may be known in advance, or maybe calculated by the instrument by measuring a standard of known concentration.

The procedure is as follows:

1. Press 4 to select Absorbance/concentration mode.
2. Set wavelength by using keypad numbers or left and right arrows. Press the down arrow key.
3. Select the mode: Absorbance, Factor or Standard, using the left and right arrows.
4. (Absorbance selected) To enter the results screen with the selected parameters press OK OR Cancel the selections and return to the initial display screen by pressing Cancel.
5. (Absorbance selected) Insert the reference sample. Press 0A/100% key. This will be used for all subsequent samples until changed.
6. (Absorbance selected) Insert sample and press OK

Repeat step 6 for all samples.

To connect a printer to the Biowave:

1. Turn the instrument over and remove cap head screws from positions A and B using the Allen key provided.

2. Turn the instrument back over and lift the accessory cover vertically upwards to remove. Remove the tie-wrap from the cable.

3. Invert the instrument and replace the cap head screws at A and B.

4. Plug the accessory cable into the printer.

5. Lower the printer onto the locating bosses and push down firmly.

Printer calibration:

Switch the instrument on and go to utilities/instrument/preferences and select the Built in printer.

**Maintenance**

Ensure you regularly have a certificated engineer to calibrate the test equipment. When using calibration standard filters, insert such that the flat surface is facing away from the spring end of the cell holder. Observe all necessary precautions if dealing with hazardous samples or solvents.

Lamp replacement:

The xenon lamp should not need replacement until after several years of use. In the unlikely event that it does need replacing, this should be undertaken by a service engineer from your supplier.

Cleaning and general care of the instrument

Switch off the instrument and disconnect the power cord. Use a soft damp cloth and clean all external surfaces, a mild liquid detergent may be used to remove stubborn marks. To change the cell holder, undo the appropriate screws on the bottom of the instrument.