1. INTRODUCTION

The BRIX handheld refractometers are high-precision optical instruments used for determining the concentration of various solutions. As such, it is critical that the instruments are properly maintained. Please follow all directions for the proper use, cleaning, and maintenance of the instrument. Failure to do so may result in inaccurate results or possible damage to the instrument.

Although the scale in these instruments display a certain %Brix range, the scale may be used as an arbitrary scale for any other solutions where a concentration measurement is desired. The above models feature Automatic Temperature Compensation. This feature allows accurate readings to be taken in most environments without having to calculate temperature effects.

2.0 MEASUREMENT OF SAMPLE

The instrument is measuring the refractive index of the sample. The %Brix scale which is seen is simply a conversion from refractive index to Percent Solids as Sucrose. This conversion factor is defined by the International Commission for the Uniform Method of Sugar Analysis (ICUMSA).

To take a %Brix sample reading, simply place a few drops of sample onto the measuring prism at the end of the instrument. Lower the sample cover onto the sample and prism. Holding the instrument under a light source, look through the eyepiece. The °Brix concentration is determined by the intersection of the boundary of the light and dark fields (known as the shadowline) on the printed scale. If the scale appears out of focus, the focusable eyepiece may be adjusted by rotating the knurled portion. The instrument also features an extendable eyeguard to prevent stray light from entering the eyepiece and causing reflections. The eyeguard may be used by gently pulling the end portion of the eyepiece, the smooth finished section, towards the eye. To lock in place, rotate the eyeguard clockwise until snug.

It may be necessary to adjust the position of the light source to maximize the contrast of the shadowline. Under normal conditions, optimal contrast is obtained by holding the instrument underneath and perpendicular to a light source.

Once a reading has been taken, thoroughly rinse the prism and sample cover with water. (For some samples, it may be necessary to clean the prism with soap and water, followed by rinsing with water.) Wipe dry with a clean soft cloth or lens tissue. Place the instrument in the provided plastic case, and store in a safe, dry environment until further measurements are desired.

Readings are automatically temperature compensated. No temperature correction calculations are necessary for readings which are taken at temperatures within the range of this mechanism. The optimal operational range for automatic temperature compensation is from 60°F (15°C) to 90°F (32°C). Outside this range, readings will vary slightly from the specified accuracy of the instrument.

3.0 CALIBRATION

The instrument has been factory calibrated to specific refractive index standards. If desired, a certified calibration may be performed on the instrument. To request this service contact a Reichert representative and ask for technical service part #13K50110.

Always thoroughly clean the prism and sample cover with water, and wipe dry with a soft cloth or lens tissue prior to calibration testing. Calibration of the instrument will rarely be required.

To verify the calibration of Models BRIX 15HP and BRIX 35HP, read a sample of distilled, deionized water between 60°F (15°C) and 77°F (25°C). If the reading varies from 0 by more than 1 scale division, recalibration may be necessary. If a standard calibration is necessary, locate the calibration adjustment access hole on the underside of the instrument. Remove the protective cap. With distilled, deionized water on the prism, adjust the allen head screw in the calibration adjustment access hole until the shadowline is centered on 0.0° Brix on the scale. Dry off the prism and sample cover, replace the calibration access hole protective cap, and proceed with normal readings. To verify the calibration of Models BRIX 65HP and BRIX 90HP, prepare a solution of a known concentration by weight of sucrose vs water (use 35% minimum for BRIX 65HP and 65% minimum for BRIX 90HP). Read the solution on the instrument. If the reading differs from the known value by more than 1 scale division, recalibration may be necessary. Follow the same procedure described previously, using the prepared solution rather than water. Adjust the calibration screw until the reading matches the known value.

4.0 TROUBLESHOOTING

Should any difficulties arise with this instrument, please refer to the following helpful hints:

- Thoroughly clean and dry the prism and sample cover prior to attempting to read any sample or calibration standard.
- Ensure that enough sample is used to obtain optimum contrast of the shadowline intersect.
- Hold the instrument underneath and perpendicular to a light source.
- Make any necessary adjustments to the focusable eyepiece.
- Extend the eyeguard to prevent stray light from entering the system and causing reflections. • Verify the calibration of the instrument using dis-tilled, deionized water.
- Samples which are not within the reading range of the instrument will not produce a visible shadowline intersect.
- Samples which are opaque, contain undissolved matter, or cause high levels of dispersion will not produce a sharp shadowline intersect.

For the following procedure, we use the BRIX 15HP (0 - 15 %Brix). You will use concentration samples that fall with-in the range of the unit you purchased.

The %Brix scale may be used as an arbitrary scale to determine the concentration of any other solution whose refractive index falls within the range of the instrument. To accomplish this, prepare three to five accurately measured, known concentration samples (e.g. 2, 4, 6, 6, 10%). Measure their values on the Brix 15HP scale, then plot a graph of actual concentration vs %Brix scale reading (see Figure #1). From this graph, the concentration of unknown samples can be accurately determined by two methods. The first method is to plot these points as a graph and then to plot a trend line as shown in Figure 1. The equation of this trend line will determine the % Concentration by entering the sample reading (as taken from the Brix 15HP) as the x variable. The second method is to simply take the reading of the sample from the instrument and refer back to the chart. Plot the point of the "Refractometer Reading" on the X-axis, then draw a line straight up until it intersects the plot line developed from the known solutions. Drawing a straight line accross from this point to the Y-axis will give you yhe solution's actual concentration.

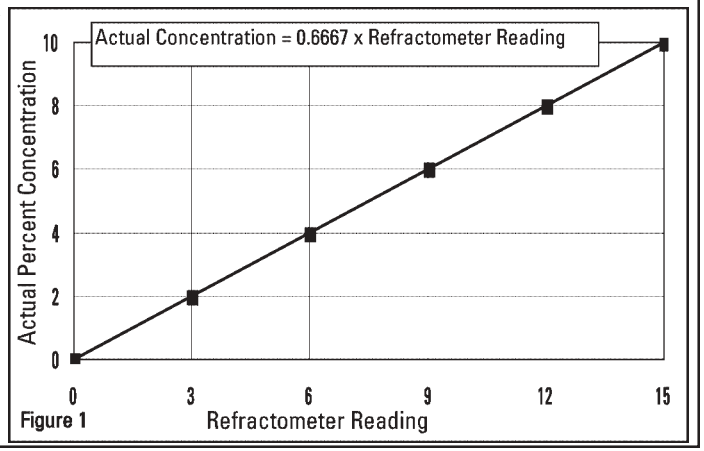
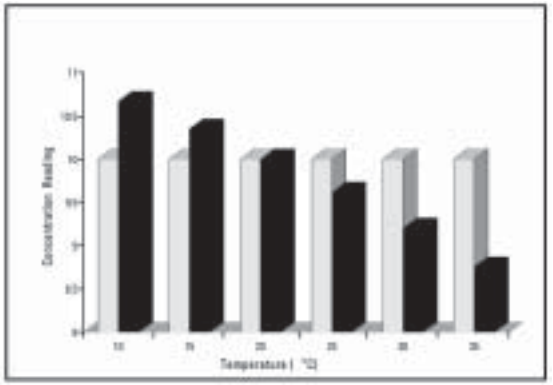
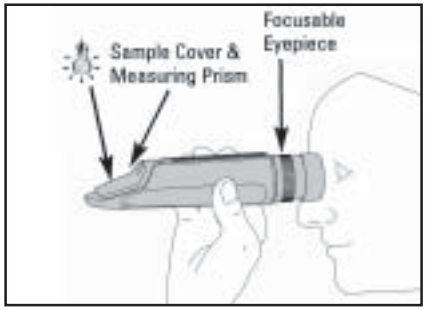


Figure 1





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ISO-9001 Certified

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BRIX 90HP

Instruction Manual