SUGAR/BRIX REFRACTOMETER

300003

INSTRUCTION MANUAL

SPER SCIENTIFIC

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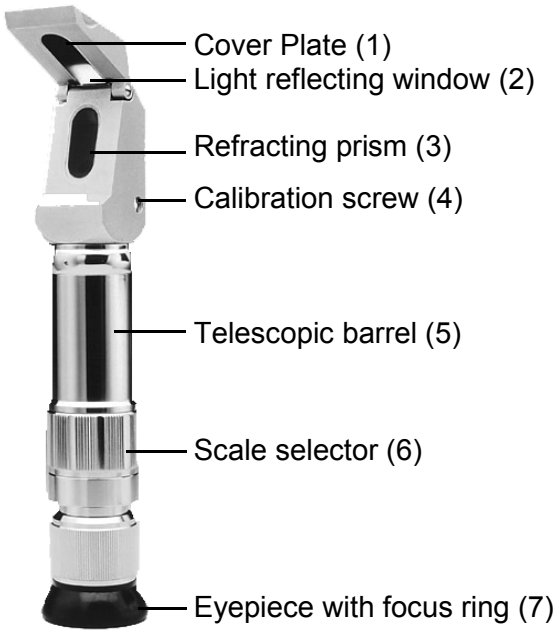
Introduction: Your portable refractometer is a precision optical instrument designed to measure the concentration of sugar in aqueous solutions. It utilized the standardized Brix scale which is accurate and easy to read. The unit's lightweight, ergonomic design makes it convenient for both laboratory and field applications. It is excellent for quality assurance, process control requirements, and scientific research.

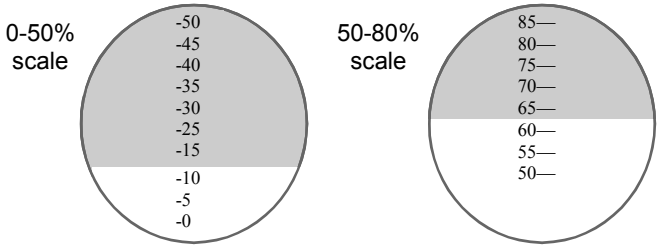
The refractometer operates on the principle that as the concentration or density of a solution increases, its refractive index changes proportionately. The refractive angle measured by your refractometer registers on the scale. The larger the concentration of sugar in solution, the higher the reading on the scale.

Panel Description:



Operating Procedures

1. With the COVER PLATE (1) open, carefully clean the PRISM (3) and REFLECTING WINDOW (2) with a soft cloth. Avoid scratching the surfaces.
2. Aim the refractometer toward a light source and select the 0-50% scale by rotating the SCALE SELECTOR (6).
3. Rotate the EYEPIECE (7) to obtain the clearest focus.
4. Adjustment of the null (reference point):
   A. Open the COVER PLATE (1).
   B. Apply a few drops of pure distilled water onto the REFRACTING PRISM (3).
   C. Close the COVER PLATE (1).
   D. Turn the CALIBRATION SCREW (4) so that the dark and light boundary line coincides exactly with the 0% line reading on the scale in the 0-50% range.
5. Carefully dry the prism platform and the LIGHT REFLECTING WINDOW (2) with a soft cloth.
6. To test your sugar sample, rotate the SCALE SELECTOR (6) to select the 0-50% range or the 50-80% range.
7. Place a few drops of the test solution on the prism and close the COVER PLATE (1) so the solution spreads evenly on the prism.
8. Aim the light reflecting windows toward the light source and focus the eyepiece on the boundary line of the light and dark hemispheres.
9. The boundary line indicates the concentration of sugar in the test sample.
10. If the boundary line is too low or too high to be read on the scale you selected, rotate the SCALE SELECTOR (6) to the other scale.



11. After use, clean the refracting and illuminating prisms with a soft cloth to remove any surface residue.
12. The temperature of the null reference liquid should be at the same temperature as the sample solution. For variations in temperature during use, the null point should be recalibrated once every 30 minutes.

Temperature Correction

Your refractometer is designed to operate with distilled water and sample solutions at a standard temperature of 20°C (68°F). To compensate for temperature conditions other than 20°C, use the Temperature Correction Table on Page 6.

Add to the reading when the temperature is above 20°C. Example: Actual temperature is 30°C. The boundary line reads a concentration of 15%. Refer to the Temperature Correction Table and locate the 15% concentration column. Follow this column down to the row that corresponds to the temperature of 30°C. At the 0.78 correction point, the actual concentration percent is 15% + 0.78%, or 15.78%.

Subtract from the reading when the temperature is below 20°C Example: Actual temperature is 16°C. The boundary line reads a concentration of 40%. Refer to the Temperature Correction Table and locate the 40% concentration column. Follow this column down to the row that corresponds to the temperature of 16°C. At the 0.30 correction point, the actual concentration percent is 40% - 0.30%, or 39.70%.

If the null liquid (distilled water) is the same temperature as the test sample and the null line of distilled water reads 0%, it is not necessary to refer to the correction table.

TEMPERATURE CORRECTION TABLE

Concentration(%)

Temperature °C			0	5	10	15	20	25	30	35	40	45	50	55	60	65	70
	10	Subtract from reading	0.50	0.54	0.58	0.61	0.64	0.66	0.68	0.70	0.72	0.73	0.74	0.75	0.76	0.78	0.79
	11		0.46	0.46	0.53	0.55	0.58	0.60	0.62	0.64	0.65	0.66	0.67	0.68	0.69	0.70	0.71
	12		0.42	0.45	0.48	0.50	0.52	0.54	0.56	0.57	0.58	0.59	0.60	0.61	0.61	0.63	0.63
	13		0.37	0.40	0.42	0.44	0.46	0.48	0.49	0.50	0.51	0.52	0.53	0.54	0.54	0.55	0.55
	14		0.33	0.35	0.37	0.39	0.40	0.41	0.42	0.43	0.44	0.45	0.45	0.46	0.46	0.47	0.48
	15		0.27	0.29	0.31	0.33	0.34	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.39	0.40	0.40
	16		0.22	0.24	0.25	0.26	0.27	0.28	0.28	0.29	0.30	0.30	0.30	0.31	0.31	0.32	0.32
	17		0.17	0.18	0.19	0.20	0.21	0.21	0.21	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24
	18		0.12	0.13	0.13	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16
	19		0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	20		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	21	Add to reading	0.06	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	22		0.13	0.13	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16
	23		0.19	0.20	0.21	0.22	0.22	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.24	0.24	0.24
	24		0.26	0.27	0.28	0.29	0.30	0.30	0.31	0.31	0.31	0.31	0.31	0.32	0.32	0.32	0.32
	25		0.33	0.35	0.36	0.37	0.38	0.38	0.39	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
	26		0.40	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
	27		0.48	0.50	0.52	0.53	0.54	0.55	0.55	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
	28		0.56	0.57	0.60	0.61	0.62	0.63	0.63	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
	29		0.64	0.66	0.68	0.69	0.71	0.72	0.72	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
	30		0.72	0.74	0.77	0.78	0.79	0.80	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81

Precautions

With reasonable care, your refractometer's reliability, precision and optical performance will not change.

- Never submerge the unit, and do not let liquid to seep into the unit's body.
- Clean the refractometer after each use with a soft cotton cloth. Do not scratch surface of the prisms.
- Store in a dry, clean, and non-corrosive environment.
- Avoid strong shocks.

Specifications

Measuring Range	0-80%
Resolution	1%
Accuracy	±1%
Size	7x 1 1/2"
Weight	19 oz
Accessories	Screwdriver, Carrying Case, Transfer Pipette, Distilled Water, Instruction Manual, Registration Card

WARRANTY

Sper Scientific warrants this product against defects in materials and workmanship for a period of **five (5) years** from the date of purchase, and agrees to repair or replace any defective unit without charge. If your model has since been discontinued, an equivalent Sper Scientific product will be substituted if available. This warranty does not cover damage resulting from accident, misuse, or abuse of the product. In order to obtain warranty service, ship the unit postage prepaid to:

SPER
SCIENTIFIC LTD.

7720 E. Redfield Suite 7
Scottsdale, Arizona 85260
WWW.SPERSCIENTIFIC.COM
SERVICE@SPERSCIENTIFIC.COM

Please Note: The defective unit must be accompanied by a description of the problem and your return address. Please be sure to return your warranty registration card within ten (10) days of purchase.