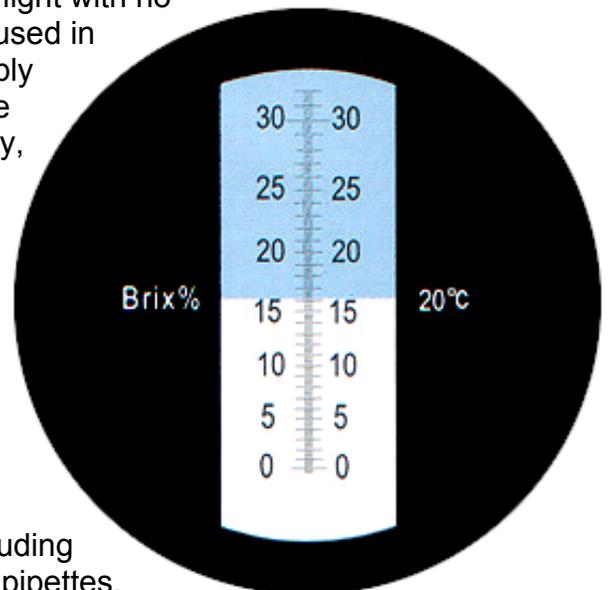




Sper Scientific portable refractometers work in ambient light with no battery or other power source necessary. They can be used in labs, on production lines, in the field, or anywhere. Simply place a drop or two of sample on the prism and read the results immediately. With reasonable care their reliability, precision, and optical performance will last forever. All Sper Scientific refractometers come complete with:

- Rubber coated hand grip and construction which insulate the test solution from inaccuracies caused by the body heat of the user.
- Covered eye piece and bright clearly defined scale, with large easy to read measurements.
- All the accessories necessary for immediate use, including calibration tools and solutions, full instructions, transfer pipettes, protective cases, and a reference block for model 300004.



#### **SUGAR/BRIX REFRACTOMETER 0-32% 300001**

The most popular refractometer range due to its usefulness in a wide variety of quality control applications for the sugar content of fruit, fruit juices, wine, milk, soft drinks and yeast cultures solutions. Also used for industrial cutting, lubricating, soluble tempering oils and emulsification solutions. Comes with a hard carrying case, calibration solution, and calibration tool.

#### **SUGAR/BRIX REFRACTOMETER W/ATC 0-32% 300010**

This refractometer features Automatic Temperature Compensation (ATC), which makes manual temperature corrections unnecessary. The most popular refractometer range due to its usefulness in a wide variety of quality control applications for the sugar content of fruit, fruit juices, wine, milk, soft drinks and yeast cultures solutions. Also used for industrial cutting, lubricating, soluble tempering oils and emulsification solutions. Comes with a hard carrying case, calibration solution, and calibration tool.

#### **SUGAR REFRACTOMETER 28-62% 300002**

Use to test solutions with a higher sugar content, such as fruit juice concentrates, canned fruits containing added sugar, or ketchup as well as for egg yolk. Comes with a hard carrying case, calibration solution, and calibration tool.

#### **CLINICAL REFRACTOMETER 300005**

Measures protein concentration, urine specific gravity, or gives the refractive index in seconds using only a few drops of blood serum, plasma, urine or albumen. Comes with a hard carrying case, calibration solution, and calibration tool.

#### **SALT REFRACTOMETER 300006**

Measures salt content in sea water, aquariums, breeding ponds, or pickling-brines. While the scale is calibrated for sodium chloride, it can also be used for calcium chloride, barium cobalt, magnesium, cesium, potassium, sodium chloride, cupric sulfate, potassium iodide, citric acid, and acetic acid (vinegar), when tested against a known standard. Comes with a hard carrying case, calibration solution, and calibration tool.

#### **SALT REFRACTOMETER W/ATC 300011**

This refractometer features Automatic Temperature Compensation (ATC), which makes manual temperature corrections unnecessary. Double scale in parts per thousand and specific gravity. Measures salt content in sea water, aquariums, breeding ponds, or pickling-brines. While the scale is calibrated for sodium chloride, it can also be used for calcium chloride, barium cobalt, magnesium, cesium, potassium, sodium chloride, cupric sulfate, potassium iodide, citric acid, and acetic acid (vinegar), when tested against a known standard. Comes with a hard carrying case, calibration solution, and calibration tool.

#### **BATTERY COOLANT REFRACTOMETER 300014**

Measures the freezing point of automotive coolants in their current concentration as well as battery charge. Both ethylene glycol and propylene glycol antifreezes can be measured, on separate scales. Battery charge is measured on a third scale using just a few drops of battery electrolyte solution (battery acid). The specific gravity of the battery acid is displayed together with a reading of RECHARGE, FAIR, or GOOD. Comes with a hard carrying case, calibration solution, and calibration tool.



**SUGAR REFRACTOMETER 0-80% 300003**  
 Covers all of the substances of the Sugar/ Brix Refractometer 0-32% 300001 and Sugar Refractometer 28-62% 300002, as well as very high sugar content products such as jam, marmalade and syrup. Its wide range also makes this refractometer a good choice for the testing of any solution with an unknown sugar content. Comes with a hard carrying case, calibration solution, and calibration tool.

Model 300003 Only



With certificate of calibration available on request: 300001C - 300014C

Model	Range	Resolution	Accuracy	Dimensions	Weight
300001	0-32% Brix	0.2%	±0.2%	6 <sup>3</sup> / <sub>4</sub> " x 1 <sup>1</sup> / <sub>2</sub> " (171 x 38 mm)	3.1 oz. (89 gr.)
300002	28-62% Brix	0.2%	±0.2%	6 <sup>1</sup> / <sub>4</sub> " x 1 <sup>1</sup> / <sub>2</sub> " (159 x 38 mm)	3.2 oz. (90 gr.)
300003	0-50% & 50-80% Brix	1%	±1%	7" x 1 <sup>1</sup> / <sub>2</sub> " (178 x 38 mm)	18 oz. (507 gr.)
300005	1 to 12g/dL Serum Albumen 1.000 to 1.040 Urine Specific Gravity 1.3330 to 1.3600 Refractive Index (nD)	0.2g/dL 0.005 0.0005	±0.2g/dL ±0.005 ±0	6 <sup>3</sup> / <sub>4</sub> " x 1 <sup>1</sup> / <sub>2</sub> " (171 x 38 mm)	3.1 oz. (88 gr.)
300006	0-28% Sodium Chloride	0.2%	±0.2%	6 <sup>3</sup> / <sub>4</sub> " x 1 <sup>1</sup> / <sub>2</sub> " (171 x 38 mm)	3.1 oz. (89 gr.)
300010	0-32% Brix	0.2%	±0.2%	6 <sup>3</sup> / <sub>4</sub> " x 1 <sup>1</sup> / <sub>2</sub> " (171 x 38 mm)	3.4 oz. (96 gr.)
300011	0 to 100 Parts Per Thousand 1.000 to 1.070 Specific Gravity	1 0.001	±1 ±.001	7 <sup>3</sup> / <sub>4</sub> " x 1 <sup>1</sup> / <sub>2</sub> " (197 x 38 mm)	8.3 oz (234 gr.)
300014	32~-60°F Ethylene Glycol 32~-50°F Propylene Glycol 1.15~1.30 Specific Gravity Battery Acid	10°F 10°F 0.01	±2°F ±2°F	6 <sup>1</sup> / <sub>2</sub> " x 1 <sup>1</sup> / <sub>2</sub> " (165 x 38 mm)	3.0 oz. (86 gr.)

## REPLACEMENT CALIBRATION ACCESSORIES

**A. 28% Brix Calibration Solution 300007**  
Individual bottles for on sight recalibrations of Refractometer 300002. Box of 10.



## PRINCIPLES OF REFRACTOMETRY

Refractometers are instruments used to measure substances dissolved in water and certain oils. The refractometer works using the principle of light refraction through liquids. As light passes from air into a liquid it slows down. This phenomenon is what gives a "bent" look to objects that are partially submerged in water. To put it simply, the more dissolved solids water contains, the slower light travels through it, and the more pronounced the "bending" effect on light. Refractometers use this principle to determine the amount of dissolved solids in liquids by passing light through a sample and showing the refracted angle on a scale. The scale most commonly used is referred to as the Brix scale. The Brix scale is defined as: the number of grams of pure cane sugar dissolved in 100 grams of pure water (grams sugar/100 grams H<sub>2</sub>O). Other scales have been developed to measure salt, serum proteins (albumen) and urine specific gravity.

