

HI96800 · HI96801 · HI96802  
HI96803 · HI96804

## Digital Refractometers

for Sugar Analysis Throughout  
the Food Industry

- **Ideal for the analysis of:**
  - Fruits, energy drinks, puddings, soy milk, juices, jam, marmalade, honey, soups, jelly, tofu and condiments
- **Dual-level LCD**
  - The dual-level LCD displays measurement and temperature readings simultaneously
- **ATC**
  - Automatic Temperature Compensation
- **Easy measurement**
  - Place a few drops of the sample in the well and press the READ key
- **BEPS**
  - Alerts the user of low battery power that could adversely affect readings
- **IP65 water protection**
  - Built to perform under harsh laboratory and field conditions
- **Quick, accurate results**
  - Readings are displayed in approximately 1.5 seconds
- **One-point calibration**
  - Calibrate with distilled or deionized water
- **Small sample size**
  - Sample size can be as small as 2 metric drops
- **Automatic shut-off**
  - After three minutes of non-use
- **Stainless steel sample well**
  - Easy to clean and corrosion-resistant
- **ABS thermoplastic casing**



### Five Instruments for Sugar Analysis

Hanna offers five sugar refractometers to meet the requirements of the food industry. The HI96800 Refractive Index/Brix, HI96801 % Brix (sucrose), HI96802 Fructose, HI96803 Glucose and HI96804 Invert Sugar digital refractometers are rugged, portable and water-resistant for measurements in the lab or field.

These optical instruments employ the measurement of the refractive index to determine parameters pertinent to sugar concentration analysis.

### Refractive Index

The actual measurement of refractive index is simple, quick and provides the operator a standard accepted method for sugar content analysis. Samples are measured after a simple user calibration with deionized or distilled water. Within seconds these instruments measure the refractive index, apply any necessary calculations and display the results in the selected unit. These digital refractometers eliminate the uncertainty associated with mechanical refractometers and are easily portable for measurements in the field.

### Features

These five instruments utilize internationally recognized references for unit conversion and temperature compensation and employ methodology recommended in the ICUMSA Methods Book (internationally recognized body for sugar analysis).

Temperature (in °C or °F) is displayed simultaneously with the measurement on the large dual-level display along with icons for low power and other helpful messages.

## 5 Digital Refractometers for Sugar Analysis to Choose from



### HI96800

Measures the refractive index in aqueous solutions. Readings can also be displayed with sucrose temperature compensation ( $n_{D_{20}}$ ) or % Brix.

- 1.3300 to 1.5080 Refractive Index range with  $\pm 0.0005$  accuracy
- 0 to 85% Brix range with  $\pm 0.2\%$  accuracy



### HI96801

Measures the refractive index to determine the % Brix of sugar in aqueous solutions. The refractive index of the sample is converted to % Brix concentration units.

- Temperature Compensation algorithms based on sucrose solution
- 0 to 85% Brix range with an accuracy of  $\pm 0.2\%$



### HI96802

Measures the refractive index to determine the % fructose in aqueous solutions. The refractive index of the sample is converted to % mass (% w/w) concentration units.

- Temperature Compensation algorithms based on fructose solution
- 0 to 85% fructose byweight range with an accuracy of  $\pm 0.2\%$



### HI96803

Measures the refractive index to determine the % glucose in aqueous solutions. The refractive index of the sample is converted to % mass (% w/w) concentration units.

- Temperature Compensation algorithms based on glucose solution
- 0 to 85% glucose by weight range with an accuracy of  $\pm 0.2\%$



### HI96804

Measures the refractive index to determine the % invert sugar in aqueous solutions. The refractive index of the sample is converted to % mass (% w/w) concentration units.

- Temperature Compensation algorithms based on invert sugar solution
- 0 to 85% invert sugar by weight range with an accuracy of  $\pm 0.2\%$

# Easy to Operate

## Startup Screens

When the meters are turned on, all of the LCD segments will be displayed followed by the percentage of battery life remaining.

## Calibration

Perform a quick and easy calibration after startup:

1. Using a pipette, completely cover the prism in the sample well with distilled or deionized water.
2. Press the ZERO key.

## Unit Selection

Just press the RANGE key to cycle through the units of measurement (HI96800).

## Measurement

Achieve fast, accurate results:

1. Using a plastic pipette, place sample onto the prism surface until the well is full.
2. Press the READ key and the results are displayed in the selected units.

## Making a Standard % Brix Solution

To make a Brix Solution, follow the procedure below:

- Place container (such as a glass vial or dropper bottle that has a cover) on an analytical balance.
- Tare the balance.
- To make an X % Brix solution, weigh out X grams of high purity sucrose (CAS #: 57-50-1) directly into the container.
- Add distilled or deionized water to the container so the total weight of the solution is 100 g.

Note: Solutions above 60% Brix need to be vigorously stirred or shaken and heated in a water bath. Remove solution from bath when sucrose has dissolved. The total quantity can be scaled proportionally for smaller containers but accuracy may be sacrificed.

### Example with 25% Brix:

|           |         |
|-----------|---------|
| % Brix    | 25      |
| g Sucrose | 25.000  |
| g Water   | 75.000  |
| g Total   | 100.000 |

| Specifications            | HI96800   | HI96801  | HI96802       | HI96803                           | HI96804                          |                                       |
|---------------------------|---|--|---------------|-----------------------------------|----------------------------------|---------------------------------------|
| Sugar Content             | Range   | 1.3300 to 1.5080 nD;<br>1.3330 to 1.5040 nD <sub>20</sub> ;<br>0.0 to 85.0% Brix | 0 to 85% Brix | 0 to 85% mass<br>(% w/w fructose) | 0 to 85% mass<br>(% w/w glucose) | 0 to 85% mass<br>(% w/w invert sugar) |
|                           | Resolution  | 0.0001 nD;<br>0.0001 nD <sub>20</sub> ;<br>0.1 % Brix                            | 0.1 % Brix    | 0.1 % mass                        | 0.1 % mass                       | 0.1 % mass                            |
|                           | Accuracy<br>(@25°C/77°F)  | ±0.0005 nD;<br>±0.0005 nD <sub>20</sub> ;<br>±0.2% Brix                          | ±0.2% Brix    | ±0.2% mass                        | ±0.2% mass                       | ±0.2% mass                            |
| Temperature               | Range   | 0.0 to 80.0°C (32.0 to 176.0°F)  |               |                                   |                                  |                                       |
|                           | Resolution  | 0.1°C (0.1°F)  |               |                                   |                                  |                                       |
|                           | Accuracy<br>(@25°C/77°F)  | ±0.3°C (±0.5°F)  |               |                                   |                                  |                                       |
| Additional Specifications | Temperature Compensation  | automatic between 10 and 40°C (50 to 104°F)                                      |               |                                   |                                  |                                       |
|                           | Measurement Time  | approximately 1.5 seconds  |               |                                   |                                  |                                       |
|                           | Minimum Sample Volume   | 100 µL (to cover prism totally)  |               |                                   |                                  |                                       |
|                           | Light Source  | yellow LED   |               |                                   |                                  |                                       |
|                           | Sample Cell   | stainless steel ring and flint glass prism                                       |               |                                   |                                  |                                       |
|                           | Auto-off  | after three minutes of non-use   |               |                                   |                                  |                                       |
|                           | Enclosure Rating  | IP65   |               |                                   |                                  |                                       |
|                           | Battery Type / Battery Life   | 9V / approximately 5000 readings   |               |                                   |                                  |                                       |
| Dimensions / Weight       | 192 x 102 x 67 mm (7.6 x 4.01 x 2.6") / 420 g (14.8 oz.)  |  |               |                                   |                                  |                                       |
| Ordering Information      | <b>HI96800, HI96801, HI96802, HI96803 and HI96804</b> are supplied with battery and instruction manual. |  |               |                                   |                                  |                                       |
| Standard                  | <b>HI4020-11</b> Brix standard 50%, 10 mL   |  |               |                                   |                                  |                                       |