HI96811 • HI96812 • HI96813
HI96814 • HI96816

Digital Refractometers

for Measurement of Sugar in Wine

Importør:
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- Dual-level LCD
  - Dual-level LCD displays measurement and temperature readings simultaneously
- ATC
  - Automatic Temperature Compensation
- 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
- Easy measurement
  - Place a few drops of the sample in the well and press the READ key
- ABS thermoplastic casing

Five instruments for Wine Analysis

Hanna offers five wine refractometers to meet the various requirements throughout the wine industry. The HI96811, HI96812, HI96813, HI96814 and HI96816 Digital Wine Refractometers are rugged, lightweight and waterproof for measurements in the lab or field.

Refractive Index

These optical instruments employ the measurement of the refractive index to determine parameters pertinent to the wine industry.

The actual measurement of the refractive index is simple and quick and provides the vintner a standard accepted method for sugar content analysis. Samples are measured after a simple user calibration with deionized or distilled water. Within seconds, the instrument measures the refractive index of the grape must. These digital refractometers eliminate the uncertainty associated with mechanical refractometers and are ideal for fast, reliable measurements.

Instrument Descriptions

HI96811 , HI96813 and HI96814 convert the refractive index of the sample to sucrose concentration in units of percent by weight, % Brix (also referred to as °Brix). The conversion used is based on the ICUMSA Methods Book (International Commission for Uniform Methods of Sugar Analysis). Since the majority of sugar in grape juice is fructose and glucose and not sucrose, the reading is sometimes referred to as "Apparent Brix".

HI96812 has units of °Baumé. The °Baumé scale is based on density and was originally designed to measure the mass of sodium chloride in water. °Baumé is used in winemaking to measure the sugar in must. The HI96812 converts the % Brix reading to °Baumé based on the table found in the Official Methods of Analysis of AOAC International, 18th Edition. One °Baumé is approximately equal to 1.8 % Brix, and 1°Baumé is roughly equivalent to 1% alcohol when the wine is fully fermented.

In addition to % Brix, HI96814 includes two other scales used in the wine industry: °Oechsle and °KMW.

°Oechsle (°Oe) is mainly used in the German, Swiss and Luxenbourgish winemaking industry to measure the sugar content of must. The °Oe scale is based on specific gravity at 20°C (S.G.(20/20)) and is the first 3 digits following the decimal point. One °Oe is roughly equal to 0.2 % Brix.

°Oe = [(S.G.(20/20)) - 1] x 1000

°Klosterneuburger Mostwaage (°KMW) is used in Austria to measure the sugar content of must. °KMW is related to °Oe by the following equation:
°Oe = °KMW x [(0.022 x °KMW) + 4.54]

1 °KMW is roughly equivalent to 1% Brix or 5 °Oe. °KMW is also known as °Babo.

"Potential" or "probable" alcohol is an estimation of the alcohol content (% vol/vol) in finished wine based on the conversion between sugar and alcohol. This conversion depends on many factors, such as the type of grapes, the grape maturity, the growing region and yeast fermentation efficiency and temperature.

The **HI96813** allows the user to tailor the instrument to their specific needs based on their experience, since no fixed conversion factor is universally applicable. The first conversion is based on the % Brix value and an adjustable conversion factor between 0.50 and 0.70 (0.55 is a common value).

Potential alcohol (% v/v) = (0.50 to 0.70) x % Brix

One drawback of the above equation is that it does not take into account the nonfermentable sugars and extract. A second equation was also added that takes these factors into account and can give a more accurate estimate of the alcohol content in the finished wine. This

conversion is named "C1" on the meter, and uses the following equation:

Potential Alcohol (%V/V) = 0.059 x [(2.66 x °Oe) - 30] (C1)

The **HI 96816** potential alcohol curve is based on the tables found in the European Economic Community Commission Regulation No 2676/90 of September 17, 1990, Determining Community Methods for the Analysis of Wine and International Organization of Vine and Wine (OIV). The potential alcohol curve is based on the following equation:

Potential alcohol (%v/v) = g/L of Sugar / 16.83

Specifications		HI96811	HI96812	HI96813	HI96814	HI96816
Sugar Content	Range	0 to 50% Brix	0 to 28°Baumé	0 to 50% Brix; 0 to 25% V/V Potential Alcohol	0 to 50% Brix; 0 to 230°Oechsle; 0 to 42°KMW	4.9 to 56.8% V/V potential alcohol; 10 to 75% Brix*
	Resolution	0.1% Brix	0.1°Baumé	0.1% Brix; 0.1% V/V Potential Alcohol	0.1% Brix; 1°Oechsle 0.2°KMW	0.1 %V/V Potential Alcohol
	Accuracy (@25°C/77°F)	±0.2% Brix	±0.1°Baumé	±0.2°Baumé; ±0.2 %V/V Potential Alcohol	±0.1% Brix; 1°Oechsle ±0.2°KMW	±0.2 %V/V Potential Alcohol
Temperature	Range	0 to 80°C (32 to 176°F)				
	Resolution	±0.1°C (0.1°F)				
	Temperature Compensation	automatic between 10 and 40°C (50 to 104°F)				
Additional Specifications	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		**HI96811**, **HI96812**, **HI96813**, **HI96814** and **HI96816** are supplied with battery and instruction manual.				

* hidden range