Digital Refractometers

From Analog to Digital

Handheld Refractometers

Manual

Analog handheld refractometers

Analog handheld refractometers work according to the critical angle principle. The lenses and prisms project a shadow line onto a small glass reticle inside the instrument, which is then viewed by the user through a magnifying eyepiece. The sample is placed between a measuring prism and a cover plate. The refractometer is pointed at a strong light source to read the shadow line (dark/bright transition).

Advantages

- Inexpensive instrument
- Straightforward/simple method

Disadvantages

- User-dependent results
- Strong light source needed to read the shadow line
- Time-consuming: A certain time is needed for the prism to establish a defined demarcation line (30 s up to several minutes)
- Narrow measuring range, low resolution (the wider the measuring range the lower the resolution)
- Mostly only single scale instruments
- Not suitable for GLP
- More difficult calibration

Digital

Digital handheld refractometers

Digital handheld refractometers operate based on the same general critical angle principle as a analog handheld refractometer. The difference is that light from an LED light source is focused on a prism element. The measurement is started by pressing a key, after a short time the result is displayed on an LCD display for easy viewing.

Advantages

- Fast measurement (2 seconds read time)
- Automated measurement
- High accuracy, no matter the light conditions
- User-independent results
- Multiple scales on one instrument
- Full refractive index/Brix range
- Even dark samples can be measured
- Simple Zero calibration

Disadvantages

- Slightly higher investment costs, but short ROI*

* ROI: Return On Investment

Moving from manual to digital refractive index measurement

Manual methods are being replaced by digital refractometers for many reasons. Even though digital refractometers are slightly more expensive, it is a necessary investment. Some key advantages of automatic refractive index measurements include time saving, higher accuracy and repeatability, and operator independent results. These lead to improved efficiency, higher throughput, as well as trustworthy data quality.

METTLER TOLEDO

The Perfect Solution
Model Overview

MyBrix pocket refractometer
Designed with a full Brix range (0.0 to 95.0 °Brix) and 10 integrated sugar-related scales for automatic, temperature-compensated conversion into Brix, Refractive Index, Oechsle, Baumé, and many more, this refractometer works perfectly for measuring almost any food and beverage sample.

With its compact, robust and weatherproof design, measurements can be performed virtually anywhere – in the field, near the production line or in a quality control lab.

Main applications: Ideal for determining the optimal harvesting time of fruits and vegetables, performing incoming goods inspection, or process and quality control in juice, wine, soft drinks and food manufacturing.

Refracto 30PX and 30GS portable refractometers
Refracto 30PX and 30GS are handheld refractometers which can be placed on a lab bench. The measuring cell can be immersed directly into the sample, or the instrument is placed on a flat surface and a drop of sample is added into the measurement cell. These instruments store up to 1100 results including sample identification, measurement unit, temperature compensation coefficient, date and time. In addition, data can be transferred to a PC or printer any time.

The Refracto 30GS has a measuring cell made of sapphire and a sample stage of hard gold plated brass. For this reason the Refracto 30GS offers a high measuring range and chemical resistance against very aggressive samples.

Main applications: Developed for a wide range of applications, from checking the sugar concentration in foods and beverages to concentration checks in the chemical industry.

Make the step into automatic refractive index measurement
Contact us to learn how you can save time, increase accuracy and improve repeatability with operator independent results. An investment in a digital refractometer would probably result in a shorter payback than expected.

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