

Thank you for purchasing this OPTi Digital Hand-Held Refractometer. In order to ensure that this product provides many years of service please follow the guidance in this document.

In order to register your instrument with the manufacturer and print a warranty certificate please visit...

www.bellinghamandstanley.com

Unpacking the instrument

Check that all parts listed below are present and that no transit damage has occurred.

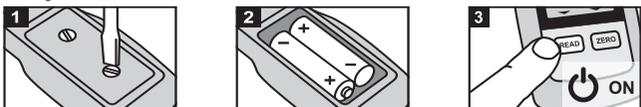
Contents list

- 1 OPTi Digital Refractometer
- 2 AAA alkaline battery (LR03)
- 1 User guide pack languages - EN, FR, DE, IT, PT-BR and ES
- 1 Certificate of Calibration
- 1 Protective carry case

User Guide Code: 38-40101PB

Quick Start Guide

Installing batteries



Zero calibration



Taking a reading



Changing measurement scale - OPTi Duo models only



Turning off



Safety precautions

WARNINGS

Always check the relevant Material Safety Data Sheet for a sample before applying it to the refractometer. When applying samples that are harmful by skin or eye contact, wear appropriate protective equipment. Avoid unnecessary contamination of the refractometer by confining samples to the prism dish.

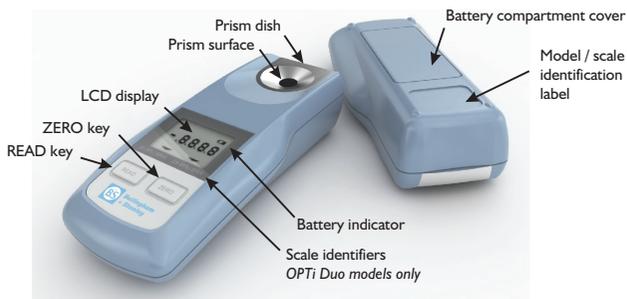
CAUTION

This digital refractometer is a precision optical instrument and should be handled with care. Do not drop or subject the instrument to sharp knocks. The instrument housing and display panel areas are constructed from plastic materials that may suffer damage if contacted with aggressive organic solvents. For example, avoid contact with solvents such as acetone and certain aromatic solvents.

Maintain your refractometer in a clean condition and avoid use and storage of the instrument outside the specified temperature range. Avoid dusty and high humidity environments and prolonged exposure to direct sunlight. Use the soft case provided to protect the instrument.

Deterioration/loss of the display may be indicative of low battery power or low ambient temperature. Do not persist in using the instrument with low battery power. Check/replace the batteries as necessary.

Instrument overview



Basic operation

Installing batteries

Remove the battery compartment cover by turning the two retaining screws in an anti-clockwise direction. Before inserting the batteries check that the compartment is clean and dry, and that the cover seal is in good order. Insert the batteries, ensuring that the battery polarity is correct. Replace the cover by turning the two retaining screws in a clockwise direction whilst the cover is in position.

It is recommended that alkaline batteries are used to reduce the frequency of battery changes.

The battery indicator will show the current state of the batteries. When the indicator shows empty replace the batteries.



Turning on and off

To turn the instrument on press READ. The instrument will automatically turn off if no buttons have been pressed for 60 seconds.

Alternatively press and hold READ for 3 seconds to switch the instrument off.

Taking a reading

Before taking a reading clean the prism surface thoroughly using a suitable solvent, e.g. water or methyl alcohol depending on the sample being measured.

Should the measurement flash, this indicates that the displayed value may be correct but should be used with caution.



Place a small amount of sample on the prism (the circular glass area in the middle of the prism dish). The complete prism surface must be covered by the sample; generally 0.3ml is sufficient to achieve this.

In certain circumstances it might be necessary to shield the prism surface from high levels of ambient light.

Press the READ key, the display will clear.

Try cleaning the prism thoroughly and re-applying the sample. This can also occur when measuring certain samples that are difficult for the instrument to measure, bubbles are present on the prism surface or the contact between the sample and the prism surface is poor.

A few seconds later the reading will be displayed. OPTi Duo models will also indicate the selected measurement scale on the display.

After a measurement has been taken the sample should be removed and the prism cleaned.

Zero calibration

The zero calibration is essential to ensure accurate readings. It is suggested that a zero calibration should be carried out daily.

consistency and quality of the particular tap water.

It is essential the prism is clean and dry prior to applying the zero sample. The zero sample should be distilled water. Should tap water be used please be aware that subsequent measurement performance could vary depending up on the

Apply 0.3 ml of water. If the water is not at ambient temperature allow time for water to temperate.

Press and hold ZERO for 3 seconds. The display will show 000 as the calibration starts.

When complete the display will show 000.

Changing the measurement scale - OPTi Duo models only

OPTi Duo models have two measurement scales, A and B. The selected scale will be indicated by an arrow on the display when the instrument is switched on.

To change the scale press and hold ZERO and within 3 seconds press READ.

The definitions for the A and B scales can be found on the underside of the instrument.

Changing scale requires that the ZERO button is held. Should the ZERO button be held for longer than specified this will cause a zero calibration to be carried out.

Automatic Temperature Compensation*1

Automatic temperature compensation will correct readings of water and sucrose solutions to 20°C. It conforms to the published ICUMSA 1978 correction tables which covers the ranges 10 to 40°C and 0 to 80° Brix and has been extended to cover 5 to 70°C by using additional data. Although the correction is specifically applicable to pure

sucrose solutions, it is also valid for many sugar based food products. However, it must be stressed that the correction values may be unsuitable for other non-sugar based products and great care should be exercised with these samples.

*1 Models fitted either without temperature compensation or a temperature compensation other than ICUMSA sugar will be clearly identified on the instrument's certificate of calibration supplied with the instrument.

Error messages

In order to achieve the maximum performance from the refractometer, it is essential that care is taken when cleaning the instrument and applying sample to the prism. Sample concentration may

vary considerably from the surface to the centre of a mass whether in a beaker or on a spoon or spatular. Evaporation can cause noticeable drifting unless care is taken.

H1	Lo	Measured sample out of range. Sample either too low or high.
EL	EH	Zero sample too low or high. Suspected incorrect calibration sample.
TL	TH	Temperature too low or high.

Warranty and customer care

This refractometer is warranted for 12 months after the date of purchase against any manufacturer defect in materials or workmanship. As this refractometer is a precision optical instrument care must be taken to ensure that correct storage, handling and use of the instrument, failure to do so

could invalidate the instrument's warranty. Contact your supplier for more details.

Declaration of conformity

Calibration of this product was carried out by Bellingham + Stanley Ltd. The calibration standards used have been calibrated by our UKAS accredited calibration laboratory no. 0834, accredited to ISO/IEC 17025:2005.



This refractometer has been found to meet the published specifications for this instrument. For the refractometer to continue to operate within our specifications, it should be kept in clean condition and well maintained in accordance with this user guide.

This declaration implies no responsibility by Bellingham + Stanley with regard to the accuracy of the instrument after the date of examination at Bellingham + Stanley.

General specification

Prism and dish	316 stainless steel	Physical	
Dish material	Silicone rubber and Viton	Length	115 mm
Prism seal	Optical glass	Width	54 mm
Prism material	8 mm diameter	Height	30 mm
Sample surface		Weight	85g (without batteries fitted)
Housing	Acrylonitrile Butadiene Styrene	Temperature	
Material	IP65 water resistant	Storage	-10 to 60°C
IP rating	95% RH	Operating	5 to 40°C
Relative humidity		Measurement	5 to 60°C

Manufacturer's details

Bellingham + Stanley Ltd.
Longfield Road, Tunbridge Wells, Kent TN2 3EY



This symbol is an internationally agreed indicator that the product bearing it should not be disposed of as general waste or garbage which might end up in landfill sites, but should instead be sent for special processing and/or recycling in those countries where appropriate legislation and facilities are in place.

