



uniREFRACTO Digital Hand Held Refractometer

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

uniREFRACTO 1	6.263 630	0-54 Brix 1.33-1.42 RI
uniREFRACTO 2	6.263 631	0-95 Brix 1.33-1.54 RI

Unpacking the instrument

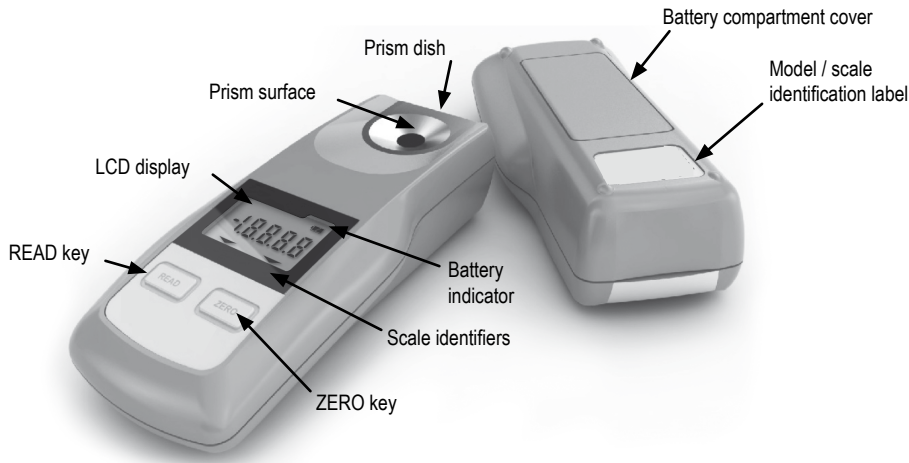
Check that all parts listed below are present and that no transit damage has occurred.

Contents list

- 1 uniREFRACTO Digital Hand Refractometer
- 2 AAA alkaline battery (LR03)
- 1 User guide

www.llg-labware.com

Instrument overview



Safety precautions

WARNINGS

Always check the relevant Material Safety Data Sheet for a sample before applying it to the refractometer. Wear appropriate protective equipment (PPE) when applying samples that may be harmful to the skin or eyes. Avoid unnecessary contamination of the refractometer by confining samples to the prism dish.

CAUTION

This 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.

INTENDED USE

This product is for general laboratory, manufacturing and research use only and is not intended for any animal or human therapeutic or diagnostic use.

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 whist the cover is in position.

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

removed during international transit or for long periods without use.

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



Turning on and off

Press READ to turn the refractometer on.

The instrument will automatically turn off if no keys are 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, eg water or methyl alcohol depending on the sample being measured.

1. Fill the prism dish
2. Press READ – the display will clear
3. A few seconds later the reading will be displayed

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. A zero calibration should be carried out daily.

Use distilled water if possible. Should tap water be used please be aware that subsequent measurement accuracy may vary depending upon the purity of the tap water.

1. Clean and dry the prism
2. Fill the sample dish with water
3. Allow sufficient time for temperature stabilisation (typically 10 seconds)
4. Press and HOLD the ZERO key for 4 seconds
5. The display will show “ooo” as the calibration starts
6. When complete the display will show “000”

Remember to hold the ZERO key for 4 seconds when calibrating with water

Special features

The refractometer has a number of special features that allow the user to configure and verify the way the instrument operates.

Definitions

“-AGt-“ Test Mode

“-tSc-“ Temperature scale selection mode

Changing the temperature display

The refractometer may be configured to display the temperature in either Celsius (°C) or Fahrenheit (°F)

1. Press and HOLD the READ key until OFF is displayed
2. Quickly release the READ key
3. Press and RELEASE the ZERO key (“-AGt” will be displayed – see “AG Test Mode”)
4. Press ZERO
5. “-tSc-“ will be displayed
6. Press READ until the desired temperature scale is selected
7. Press ZERO to select the displayed temperature format

Verifying the instrument using a sucrose solution

The measurement performance of the refractometer may be verified using a sucrose solution (weight/weight) of known concentration:

1. Perform a zero calibration
2. Fill the prism dish with the sample
3. Allow sufficient time for temperature stabilisation (typically 10 seconds)
4. Press READ
5. The refractometer may be considered to be performing correctly if the reading is equal to the concentration of the sucrose solution ±0.2 °Brix (or equivalent for non-Brix models)

If the instrument is found to be out of specification, repeat the test and if necessary contact the manufacturer for further advice.

Displaying the temperature

The refractometer can display the temperature of the last reading:

1. Quickly press & RELEASE the ZERO key
2. The temperature will be displayed in the configured scale (see “changing the temperature display” in the “Special Features” section)
3. NOTE: If a reading has not been taken the display will show “--.-°C” (or °F if selected)

Changing the measurement scale (Duo models only)

The refractometer has two measurement scales as indicated on the Certificate of Calibration. The selected scale will be indicated by an arrow on the display. To change the scale:

1. Press and HOLD the ZERO key
2. Within 3 seconds PRESS and RELEASE the READ key to toggle between the scales until the desired measurement scale is selected

Changing scale requires the ZERO key to be held. Holding the ZERO key for longer than specified will cause a zero calibration to be performed!

Verifying the instrument using the “AG Test Mode”

As an alternative to using a sucrose based solution of limited shelf life, the refractometer may be verified using a convenient “long-life” AG Fluid. However, as the AG Fluid is not sucrose based, it cannot be corrected for temperature using ICUMSA (sucrose) compensation, so the refractometer incorporates a special “Test Mode” to facilitate the use of the AG Fluids as follows:

1. Perform a zero calibration
2. Press and HOLD the READ key until OFF is displayed
3. Quickly release the READ key
4. Press and RELEASE the ZERO key “-AGt-“ will be displayed (This is the “AG Test Mode”)
5. Press the READ key (“-AGt-“ flashes)
6. Fill the prism dish with the AG Fluid
7. Allow sufficient time for temperature stabilisation (typically 10 seconds)
8. Press READ (The instrument will alternate between the result and “-AGt-“ to indicate that it is in the “Test Mode”
9. The refractometer may be considered to be performing correctly if the reading is equal to the concentration of the AG Fluid ±0.2 °Brix
10. Turn OFF the instrument to EXIT the Test Mode

If the instrument is found to be out of specification, repeat the test and if necessary contact the manufacturer for further advice.



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.



This symbol indicates a caution or warning, please refer to the manual.

Automatic temperature compensation

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.

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 spatula. Evaporation will cause the reading to drift unless care is taken.

H <sub>i</sub>	L <sub>o</sub>	Measured sample out of range. Sample either too low or high or of insufficient volume
LL	LH	Temperature too low or high.
		Battery too low
123 (flashes)		Excessive ambient light (-HAL-) or insufficient sample
-.-.C/F		No recorded temperature
- AGt - / 40.1 (alternates)		AG Test Mode is active

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. Please contact your supplier for more details.

General specification

Prism and dish

Dish material	316 stainless steel
Prism seal	Silicone rubber and Viton
Prism material	Optical glass
Sample surface	8 mm diameter

Physical

Length	115 mm
Width	54 mm
Height	30 mm
Weight	85g (without batteries fitted)

Housing

Material	Acrylonitrile Butadiene Styrene
IP rating	IP65 water resistant
Relative humidity	95% RH

Temperature

Storage	-10 to 60°C
Operating	5 to 40°C
Brix measurement	5 to 60°C
RI measurement	5 to 40°C

Measurement

uniREFRACTO 1 (°Brix / RI)	0-54 / 1.33-1.42
uniREFRACTO 2 (°Brix / RI)	0-95 / 1.33-1.54
Resolution (°Brix / RI)	0.1 / 0.0001
Accuracy (°Brix / RI)	±0.2 / ±0.0003

Manufacturer's details

Manufactured in the UK  
Lab Logistics Group GmbH  
Am Hambuch 1, 53340 Meckenheim, Deutschland  
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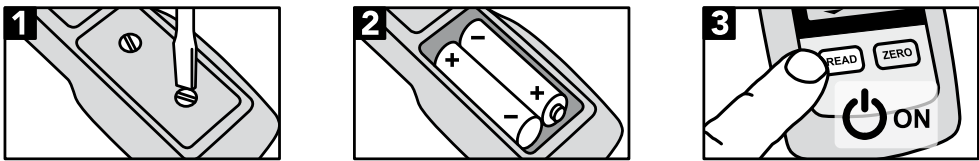




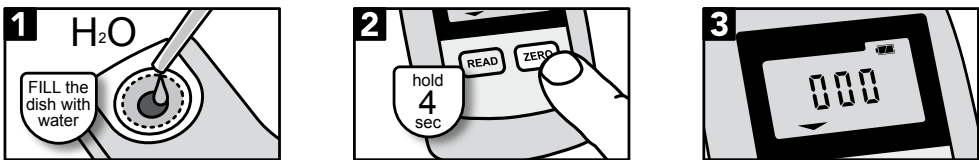
uniREFRACTO Digital Hand Held Refractometer

Quick Start Guide

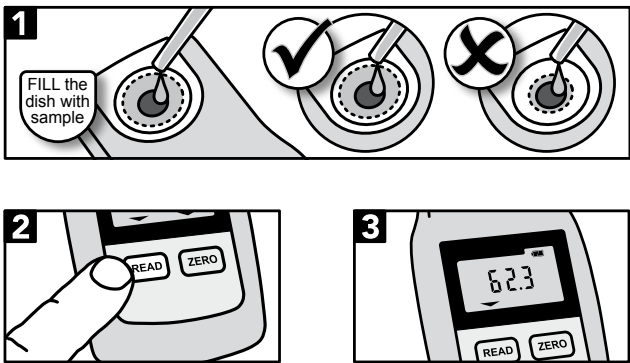
Installing batteries



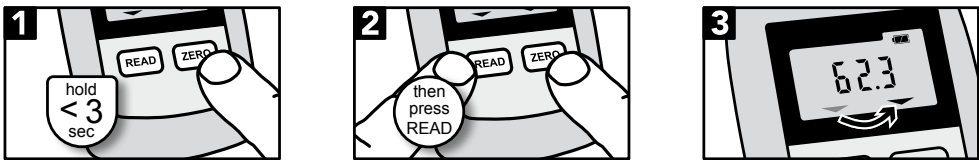
Zero calibration



Taking a reading



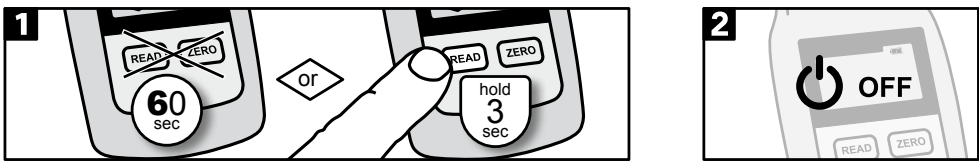
Changing measurement scale



Displaying the measurement temperature



Turning off



Manufacturer's details

Manufactured in the UK  
Lab Logistics Group GmbH  
Am Hambuch 1, 53340 Meckenheim, Deutschland  
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Declaration of conformity

According to ISO/IEC 17050-1 & 2 : 2004 we declare that the Digital Hand Held Refractometer (all models) conforms to the following technical requirements:

EMC	Emissions	
	EN 61326-1:2006	CISPR 11:2003, Class B
	AS/NZS CISPR 11	CISPR 11:2003, Class B
	FCC/CFR 47:Part 15	ANSI C63.4:2003, Class B
	Canadian Standard ICES-003:Issue 4	CISPR 22:1997 inc A2:2003
	Immunity	
	EN 61326-1:2006	IEC 61000-4-2:1995 inc A2:2001
	EN 61326-1:2006	IEC 61000-4-3:2002 & 2006
Supplementary	The product herewith complies with the requirements of the EMC Directive 2004/108/EC.	

Test statement

MODEL	uniREFRACTO 1 (Part Nr. 6.263 630)	uniREFRACTO 2 (Part Nr. 6.263 631)	
RANGE	0-54 / 1.33-1.42	0-95 / 1.33-1.54	
SERIAL No.			
TESTED BY			