



Digital Refractometer



Operating Manual

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Carefully read through the operating manual even if you have prior experience with KERN refractometers.

1. General information

1.1 Intended use
 The refractometer is a measuring instrument for determining the refractive index of transparent substances in liquid or in some cases also in the solid state. It is used to observe the behaviour of light as it passes from a prism with known properties to the substance being tested. Use of the refractometer for other purposes is contrary to its intended use and may be hazardous. The manufacturer shall not be liable for any damages caused by improper use.

1.2 Warranty
 The warranty shall be void in the event of:
 • Failure to observe the instructions in the operating manual
 • Use for purposes other than those described
 • Modifications or opening the device housing
 • Mechanical damage and/or damage resulting from media, liquids, natural wear and tear

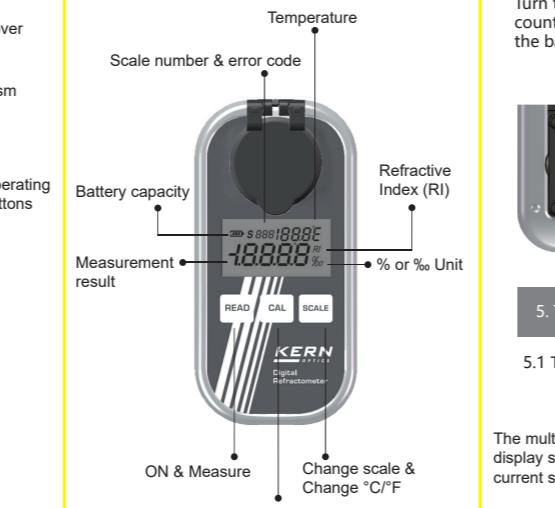
Carefully read through the operating manual even if you have prior experience with KERN refractometers.

Warning: This digital refractometer cannot measure any liquid that is highly corrosive to metal or glass. When measuring liquids that are corrosive to plastics or react chemically with plastics, be careful not to drop the measured liquid onto the shell. Otherwise it will corrode the shell.

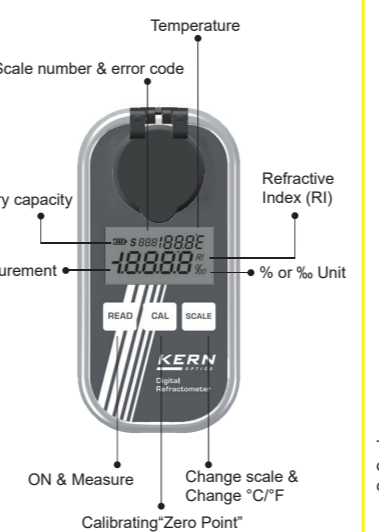
2. Introduction

2.1 Description

2.2 Scope of delivery
 1x Storage box | 1x Digital refractometer | 1x Operating manual | 1x AAA Battery 1.5 V | 1x Pipette | 1x Screwdriver



3. Display & operating buttons



4. Preparing before operating

4.1 Install the battery
 Turn the screw counterclockwise to open the battery hatch. Put 1 piece of 1.5V battery into the cabin in the right way and recover the cabin again. Only for KERN service staff.

5.1 Turn on
 The multi-function display shows the current scale number. If there is no sample filled in, the display shows "- - - -". Press "READ" to turn on the refractometer.

5.2 Measure

After turning on, clean the sample tank with distilled water and then dry it. Now fill the sample up to the mark, close the cover and press "READ".

Measurement result outside the measuring range: HHH, LLL.

Measurement result: 20.4°C, 0.1%.

Measurement result: 42.0°C, CAL.

Further error codes can be found in the appendix.

5.3 Average value measurement

Press "READ" for 2 seconds. The device starts an automatic measurement series of 15 measurements and shows the average value. Afterwards, the device automatically turns back to the normal measuring mode.

Press "CAL" for 2 seconds to enter calibration mode. Then press "CAL" again for 2-3 seconds until "CAL" flashes in the display.

6. Calibration

The refractometer can only be calibrated with distilled water. To do this, fill the sample tank with distilled water up to the mark and close the cover.

While "CAL" is flashing in the display, press "CAL" again to start the calibration. When the calibration is finished, the display shows "End". After approx. 10 seconds, the device automatically returns to normal mode.

If the calibration was not completed successfully, an error code appears in the display. Here, for example, A01.

7. Changing scale & temperature unit

7.1 Changing scale
 Press "SCALE" to change into another scales and show the converted value.

7.2 Changing temperature unit
 To change the temperature unit, press "SCALE" for 2 seconds.

If exceeded the temperature limitations, the signs "HHH" or "LLL" would show.

Turning off: If without any operations for 1 minute, the instrument would be automatically turned off.

Cleaning & maintenance: 1. To avoid damages to the prism and the sample tank, clean them with distilled water after each use. 2. Dry it with a soft cloth afterwards. 3. Do not use hard or abrasive objects for cleaning. 4. Do not leave any residue in the sample tank. 5. If the refractometer is not going to be used for a longer time, remove the battery and store it at a cool and dry place.

Disposal: The packaging consists of environmentally friendly materials which can be disposed of via local recycling facilities. The device and storage box should be disposed of by the operator in accordance with applicable national or regional regulations at the place of use. NOTE: In accordance with the Battery Ordinance (BattV), batteries must not be disposed of in household waste. The end user is legally obliged to return them.

8. Turning off

If without any operations for 1 minute, the instrument would be automatically turned off.

9. Cleaning & maintenance

1. To avoid damages to the prism and the sample tank, clean them with distilled water after each use.
 2. Dry it with a soft cloth afterwards.
 3. Do not use hard or abrasive objects for cleaning.
 4. Do not leave any residue in the sample tank.
 5. If the refractometer is not going to be used for a longer time, remove the battery and store it at a cool and dry place.

10. Disposal

The packaging consists of environmentally friendly materials which can be disposed of via local recycling facilities. The device and storage box should be disposed of by the operator in accordance with applicable national or regional regulations at the place of use. NOTE: In accordance with the Battery Ordinance (BattV), batteries must not be disposed of in household waste. The end user is legally obliged to return them.

11. Technical data

Scale + accuracy + resolution	Depents to the model
Temperature	0,0 – 40,0 °C / 32,0 – 104,0 °F
Automatic Temperature Compensation	Yes
Minimum sample volume	0.2 - 0.3 ml (Marking ring)
AUTO-OFF	60 seconds
Averaging measurement	15 measurements
Battery	1 x AAA 1.5 V
Lifetime of the battery	Approx. 10.000 measurements
Overall dimensions LxWxH	125x65x30 mm
Net weight	140 g (without battery)

12. Error codes

code	Instructions
A01	Beyond the scope of calibration temperature. (0.0°C-40.0°C)
A02	During calibration, no solution or solution wrong.
A03	This instrument has a hardware failure.

13. Models and scales

Model	Scale	No.	Range	Unit	Resolution	Accuracy
ORM 10BM	Refractive Index	S02	1.3330-1.4200	nD	0.0001nD	±0.0003nD
		BIn	0.0-99.9	%	0.1%	±0.2%
ORM 1RS	Refractive Index	S02	1.3330-1.5177	nD	0.0001nD	±0.0003nD
		BIn	0.0-99.9	%	0.1%	±0.2%
ORM 1SU	Fructose	S02	0.0-99.9	%	0.1%	±0.2%
		BIn	0.0-99.9	%	0.1%	±0.2%
	Refractive Index	S04	1.3330-1.5177	nD	0.0001nD	±0.0003nD
		BIn	0.0-99.9	%	0.1%	±0.2%
ORM 2SU	Lactose	S01	0.0-18.5	%	0.1%	±0.2%
		S02	0.0-15.6	%	0.1%	±0.2%
		S03	0.0-18.6	%	0.1%	±0.2%
ORM 1HD	Honey Water	S01	0.0-50.0	%	0.1%	±0.2%
		S02	0.0-50.0	%	0.1%	±0.2%
	Honey Bourne	S02	0.0-50.0	%	0.1%	±0.2%
		BIn	0.0-99.9	%	0.1%	±0.2%
ORM 1NA	Refractive Index	S04	1.3330-1.5177	nD	0.0001nD	±0.0003nD
		S01	0.0-29.9	%	0.1%	±0.2%
	Salinity (N/Cl) %	S02	0-29.9	%	1%	±2%
		S03	1.000-1.220	-	0.001	±0.002
ORM 1SW	Refractive Index	S04	0.0-99.9	%	0.1%	±0.2%
		S05	1.3330-1.4200	nD	0.0001nD	±0.0003nD
	Salinity Seawater	S01	0-100	‰	1%	±2%
		S02	0-97	‰	1%	±2%
ORM 1AL	Alcohol Meas.	S01	0-72	°	1%	±1%
		S02	0-80	°	1%	±1%
	Refractive Index	S05	1.3330-1.4200	nD	0.0001nD	±0.0003nD
		S04	0.0-99.9	%	0.1%	±0.2%
ORM 1BR	Refractive Index	S04	1.3330-1.4200	nD	0.0001nD	±0.0003nD
		S01	0.0-29.9	°P	0.1	±0.3
	SG Wort	S02	1.000-1.130	-	0.001	±0.002
		BIn	0.0-99.9	%	0.1%	±0.2%
ORM 1WN	Refractive Index	S04	1.3330-1.4200	nD	0.0001nD	±0.0003nD
		S01	0-150	°Dm	1	±2
	VoH ₂	S02	0.0-22.0	%	0.1%	±0.2%
		KMW (Baob)	S03	0.0-29.0	-	0.1
ORM 2WN	Refractive Index	S04	0.0-99.9	%	0.1%	±0.2%
		S03	0.0-29.0	-	0.1	±0.2
	KMW (Baob)	S03	0.0-29.0	-	0.1	±0.2
		BIn	0.0-99.9	%	0.1%	±0.2%
ORM 1CD	Refractive Index	S04	0.0-29.0	%	0.1	±0.2
		S03	0.0-29.0	%	0.1%	±0.2%
	CorRee TDS 1	S01	0.00-25.00	-	0.01	±0.20
		S02	0.00-25.00	-	0.01	±0.20
ORM 2CD	Refractive Index	S03	1.3330-1.4200	nD	0.0001nD	±0.0003nD
		S02	0.00-25.00	-	0.01	±0.20
	CorRee TDS 2	S01	0.00-25.00	-	0.01	±0.20
		S02	0.00-25.00	-	0.01	±0.20
ORM 1UN	Refractive Index	S04	1.3330-1.4200	nD	0.0001nD	±0.0003nD
		S03	0.0-50.0	%	0.1%	±0.2%
	Satin Protein	S02	0.0-20.0	g/100ml	0.1	±0.2
		BIn	0.0-99.9	%	0.1%	±0.2%
ORM 2UN	Refractive Index	S04	1.3330-1.4200	nD	0.0001nD	±0.0003nD
		S01	1.000-1.060	-	0.001	±0.002
	Urine Dng	S02	1.000-1.060	-	0.001	±0.002
		BIn	0.0-99.9	%	0.1%	±0.2%
ORM 1CA	Refractive Index	S04	1.3330-1.4200	nD	0.0001nD	±0.0003nD
		S01	40.0-0.0	°C	0.1°C	±0.5°C
	Clear	S02	0.0-51.0	°	0.1%	±0.2%
		Battery Fluid	S03	1.000-1.800	-	0.001
ORM 2CA	Refractive Index	S04	0.0-99.9	%	0.1%	±0.2%
		S03	1.3330-1.4200	nD	0.0001nD	±0.0003nD
	Ethylenglycol (%)	S01	0.0-100.0	%	0.1%	±0.5%
		S02	1.00-0.00	°C	0.1°C	±0.5°C
Propylenglycol (%)	S03	0.0-100.0	%	0.1%	±0.5%	
	S04	40.0-0.0	°C	0.1°C	±0.5°C	
BIn	S05	0.0-99.9	%	0.1%	±0.2%	