



Transport and storage case



Rear view, screw-on battery compartment cover

Digital measurement of refraction index for universal application

Features

- The KERN ORM refractometers are accurate and universal maintenance free digital handheld refractometers
- They are characterized by their easy-using and robustness
- The typical and practical design is suitable for a quick and convenient everyday use
- The large, easy-to-read display with integrated temperature display supports the user to reliably determine the measurement
- The integrated automatic temperature compensation (ATC), avoids the manual conversion of the measurement. This allows a quick and efficient usage of the instrument
- Rapid, user-friendly calibration of the refractometer is possible at any time using standard commercial distilled water
- The refractometers from the KERN ORM range are protected to international IP65 protection class, against dust and water splashes. After use, you can rinse the refractometer under running water
- Mean value measurements possible
- The following accessory-parts are included:
 - Prism cover lid
 - Pipette
 - Storage box
 - 1 x AAA battery
 - Screwdriver

Technical data

- Measurement temperature: 0 °C – 40 °C
- Overall dimensions W×D×H 121×58×25 mm
- Net weight approx. 289 g
- Power supply: 1 x AAA (1,5 V)
- Lifetime of the battery: approx. 10.000 measurements
- ATC (Automatic Temperature Compensation)
- Minimum sample volume: 4 drops
- Automatic energy management (AUTO-OFF after 60 seconds)
- Mean value measurement (15 measurements)

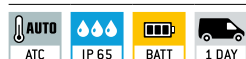
Accessories

- Calibration liquid



Also available with calibration certificate, see page 108!

STANDARD



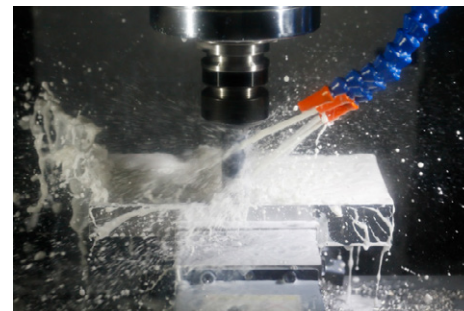
Scope of application: Basic measurements for Brix and refractive index

The following models are particularly suitable for basic measurement where the result is required in Brix or refractive index. They are used to determine the sugar content in food or for monitoring processes in the industry (coolant monitoring, water-based mixtures). Alternatively the display can be switched to show Brix or the refractive index.

The main scope of applications is:

- Industry: Monitoring of lubricants in machines and quality control
- Food industry: Beverages, fruits and sweets
- Agriculture: Determination of the degree of ripeness of fruit for quality control in harvesting
- Restaurants and large-scale catering establishment

Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 50BM	Brix	0 – 50 %	± 0,2 %	0,1 %	370,-
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	
ORM 1RS	Brix	0 – 90 %	± 0,2 %	0,1 %	470,-
	Refractive index	1,3330 – 1,5177 nD	± 0,0003 nD	0,0001 nD	



Scope of application: Sugar

The following models are particularly suitable for direct measurement of different types of sugar. These are used to determine the content of the respective type of sugar in water-based liquids. It is possible to switch between the four different scales.

The main scope of applications is:

- Food industry: Beverages, fruits and sweets
- Agriculture: Determination of the degree of ripeness of fruit for quality control in harvesting
- Restaurants and large-scale catering establishment



Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 1SU	Fructose	0 – 69 %	± 0,2 %	0,1 %	470,-
	Glucose	0 – 60 %	± 0,2 %	0,1 %	
	Brix	0 – 90 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,5177 nD	± 0,0003 nD	0,0001 nD	
ORM 2SU	Lactose	0 – 17 %	± 0,2 %	0,1 %	370,-
	Maltose	0 – 16 %	± 0,2 %	0,1 %	
	Dextran	0 – 11 %	± 0,2 %	0,1 %	
	Brix	0 – 50 %	± 0,2 %	0,1 %	

Scope of application: Honey

The following model is particularly suitable for the measurement of the water content in honey according to the International Honey Commission (IHC2002) and “degrees Baumé” to determine the relative density of liquids. Alternatively the display can be switched to show Brix or the refractive index.

The main scope of applications is:

- Beekeeping
- Honey production



Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 1HO	Brix	5 – 38 %	± 0,2 %	0,1 %	470,-
	Baumé	33 – 48 °Bé	± 0,2 °Bé	0,1 °Bé	
	Water content	0 – 90 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,5177 nD	± 0,0003 nD	0,0001 nD	

Scope of application: Salt

The following models are particularly suitable to determine the concentration of NaCl (salt) in water and seawater. This is often used for the preparation and for the cooking of sauces, bases for pastries, the production of brines (e.g. for white cheese) and the preparation of seafood and marinades for meat. Alternatively the display can be switched to show Brix or the refractive index.

The main scope of applications is:

- Food industry
- Restaurants, and large-scale catering establishment, canteens
- Fisch farm



Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 1NA	Salt content (NaCl) %	0 – 28 %	± 0,2 %	0,1 %	370,-
	Salt content (NaCl) ‰	0 – 280 ‰	± 2 ‰	1 ‰	
	Salt content (specific gravity)	1,000 – 1,220	± 0,002	0,001	
	Brix	0 – 50 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	
ORM 1SW	Salt content seawater	0 – 100 ‰	± 2 ‰	1 ‰	370,-
	Chlorine content seawater	0 – 57 ‰	± 2 ‰	1 ‰	
	Salt content (specific gravity)	1,000 – 1,070	± 0,002	0,001	
	Brix	0 – 50 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	

Scope of application: Beer/alcohol

The following models are particularly suitable for determining the sugar content of the original wort of beer in its unfermented state. The value can be read straightaway, without having to be converted, using the Original gravity (specific weight) and Degrees Plato scales. In addition, the percent by volume and percent by mass scales can be used to determine the alcohol content of clear spirits.

The main scope of applications is:

- Beer brewers
- Alcohol production



Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 1AL	Percentage by mass	0 – 72 %	± 1 %	1 %	370,-
	Percentage by volume	0 – 80 %	± 1 %	1 %	
	Brix	0 – 50 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	
ORM 1BR	Plato	0 – 31 °P	± 0,3 °P	0,1 °P	370,-
	Original gravity (specific weight)	1,000 – 1,130	± 0,002	0,001	
	Brix	0 – 50 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	

Scope of application: Wine

The following models are particularly suitable for the measurement of the sugar content in fruit. It indicates the expected °Alcohol of the fruit. The degree of ripeness of fruit (fruit-sugar) can also be determined, such as e.g. grapes. Alternatively the display can be switched to show Brix.

The main scope of applications is:

- Agriculture: Wine-growing (viticulture) and fruit-growing
- Wine-production
- Must and alcohol production



°Oe = Degree Oechsle, °KMW = Klosterneuburger Most Waage

Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 1WN	Oechsle	0 – 150 °Oe	± 2 °Oe	1 °Oe	370,-
	Percentage by volume	0 – 22 %	± 0,2 %	0,1 %	
	KMW (Babo)	0 – 25 °KMW	± 0,2 °KMW	0,1 °KMW	
	Brix	0 – 50 %	± 0,2 %	0,1 %	
ORM 2WN	Oechsle France	0 – 230 °Oe	± 2 °Oe	1 °Oe	370,-
	Percentage by volume	0 – 22 %	± 0,2 %	0,1 %	
	KMW (Babo)	0 – 25 °KMW	± 0,2 °KMW	0,1 °KMW	
	Brix	0 – 50 %	± 0,2 %	0,1 %	



Scope of application: Coffee

The following models are particularly suitable for measuring the dissolved solids (TDS) in coffee to determine or compare the strength of a cup of coffee. For roasting plants, the TDS% value is used to determine the solubility level of a roast and to control the quality. Alternatively the display can be switched to show Brix or the refractive index.

The main scope of applications is:

- Coffee industry
- Coffee roasting plants
- Coffee competitions



Modell	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 1CO	Coffee TDS 1	0 – 25 %	± 0,2 %	0,1 %	370,-
	Brix	0 – 50 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	
ORM 2CO	Coffee TDS 2	0,00 – 25,00 %	± 0,2 %	0,01 %	370,-
	Brix	0,00 – 30,00 %	± 0,2 %	0,01 %	
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	

Scope of application: Urine

The following models are particularly suitable for the measurement of the specific gravity (sg) in urine, the quantity of serum (serumproteine) in urine (doping control among athletes), and the refractive index.

The main scope of applications is:

- Hospitals
- Doctor's surgeries/Physicians
- Medical training institutions
- Nursing homes
- Sports medicine (doping test)
- Veterinary



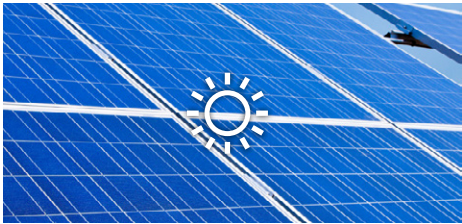
Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 1UN	Urine (spec. gravity)	1,000 – 1,050	± 0,002	0,001	370,-
	Serum protein	0 – 12 g/100 ml	± 0,2 g/100 ml	0,1 g/100 ml	
	Brix	0 – 50 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	
ORM 2UN	Urine (s. g. dog)	1,000 – 1,060	± 0,002	0,001	370,-
	Urine (s. g. cat)	1,000 – 1,060	± 0,002	0,001	
	Brix	0 – 50 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	

Scope of application: Industry/Automotive

The following models are particularly suitable for the measurement and determination of AdBlue®, glycol concentration ethylene (EG) and propylene (PG), battery fluid (BF), urea, the freezing point of windscreen wash water (CW). Furthermore these models are suitable for the measurement of thermal exchange systems. Alternatively the display can be switched to show Brix or the refractive index.

- The main scope of applications is:
- Automotive industry: Car-workshops and producers
 - Chemical industry
 - Solar industry: Antifreeze monitoring

Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORM 1CA	Wash water	(-60) – 0 °C	± 0,5 °C	0,1 °C	370,-
	AdBlue®	0 – 51 %	± 0,2 %	0,1 %	
	Battery fluid	1,000 – 1,500 kg/l	± 0,005 kg/l	0,001 kg/l	
	Brix	0 – 50 %	± 0,2 %	0,1 %	
ORM 2CA	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD	470,-
	Ethylene glycol (%)	0 – 100 %	± 0,5 %	0,1 %	
	Ethylene glycol (° C)	(-50) – 0 °C	± 0,5 °C	0,1 °C	
	Propylene glycol (%)	0 – 100 %	± 0,5 %	0,1 %	
	Propylene glycol (°C)	(-60) – 0 °C	± 0,5 °C	0,1 °C	
	Brix	0 – 90 %	± 0,2 %	0,1 %	





Transport and storage case



Rear view, screw-on battery compartment cover

Digital refractive index measurement for laboratories and the industry for multi-application ► Laboratory refractometer

Features

- The models in the KERN ORL range are accurate, universal and maintenance-free digital desktop refractometers
- Other key features are the extra-large measuring range and a high degree of accuracy
- With their handy design, they are ideal for convenient and rapid everyday use
- The large, easy-to-read multi-function display with integrated temperature display supports the user to reliably determine the measurement
- The integrated automatic temperature compensation (ATC), avoids the manual conversion of the measurement. This allows a quick and efficient usage of the instrument

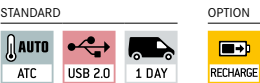
- Rapid, user-friendly calibration of the refractometer is possible at any time using standard commercial distilled water
- Mean value measurement (15 measurements)
- The following accessory-parts are included:
 - Pipette
 - Storage box
 - USB cable
 - Power adapter
 - Screwdriver

Technical data

- Measurement temperature: 0 °C – 40 °C
- Overall dimensions W×D×H 180×100×55 mm
- Net weight approx. 365 g (without battery)
- Power supply: USB connection, as an alternative 1 × battery 3.7 V 3000 mA (not included with delivery)
- ATC (Automatic Temperature Compensation)
- Minimum sample volume: 0,3–0,4 ml
- Automatic energy management (AUTO-OFF after 3 Minutes)
- Mean value measurement (15 measurements)

Accessories

- Rechargeable Battery 3,7 V 3000 mA, KERN ORL-A2007, € 65,-
- ORA-A1010 Calibration liquid



Model	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
KERN					
ORL 94BS	Brix Refractive index	0 – 94 % 1,3330 – 1,5290 nD	± 0,1 % ± 0,0002 nD	0,1 % 0,0001 nD	920,-

! Also available with calibration certificate, see page 108!



KERN & SOHN GmbH
Kernlabor seit 1994 / Calibration laboratory since 1994
Ihr Partner für Kalibrierdienstleistungen, Prüfmittelmanagement und Beratung
Your partner for calibration services, test equipment management and support.

Kalibrierschein
Calibration certificate

R8-101-KERN-2023-09

Kalibriergesamt /
Prüfung:
Calibration object: Digitales Handrefraktometer
Digital hand refractometer

Hersteller /
Manufacturer:
KERN & Sohn GmbH
Ziegelei 1
72336 Balingen
Deutschland

Typ /
Type:
ORM 1WN

Fabrikat-/Serien-Nr.
Serial number:
ORM2M0194

Auftraggeber /
Customer:

Auftragsnummer /
Order No.: 2023-2306915

Datum der Kalibrierung /
Date of calibration: 01.09.2023

Ort der Kalibrierung /
Place of calibration: Kalibrierlaboratorium KERN Optics
Calibration laboratory KERN

Kalibrierverfahren /
Calibration method:

Referenzlösung 1:
Reference solution 1:
Lösung 1:
Solution 1:
0.0 % Brix

Referenzlösung 2:
Reference solution 2:
Lösung 2:
Solution 2:
30.0 % Brix

Messergebnisse /
Measurement results:

Die englische Übersetzung des Kalibrierscheins ist eine unverbindliche Übersetzung. Im Zweifelsfall gilt der deutsche Originaltext.
The English version of the calibration certificate is not binding. In case of doubt, the German original must be used.

Der Prüfling und die Referenzlösungen werden zur Temperaturgleichung im klimatisierten Raum in unmittelbarer Nähe zueinander platziert. Nach einer Zeit von 24 Stunden werden Messungen der Referenzlösungen mit dem Prüfling durchgeführt.
The instrument and the reference solutions are acclimated in an air-conditioned room for acclimation. After 24 hours measurements of the reference solutions are repeated with the instrument.

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine ohne Unterschrift haben keine Gültigkeit.
This calibration certificate may not be reproduced other than in full except with the permission of the issuing laboratory. Calibration certificates without signature are not valid.

Datum /
Date: 01.09.2023

Leiter Kern Optics /
Head of Kern Optics: Daniel Junger

Bearbeiter /
Person responsible: Patricia Schoen

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OX003 (rev 2.0)

Your partner for calibration services, management of test equipment and support

Features

- Any analogue or digital refractometer will only give correct results if it is checked regularly, i.e. calibrated correctly and adjusted when required. A refractometer or another measuring device is only a reliable measuring and checking tool if it is calibrated and this calibration is documented as part of a quality procedure
- Measuring "correctly" is of elementary significance, as it is not unusual for inaccurate or "wrong" measurements to have expensive economic consequences. Calibration or establishing the accuracy of checking equipment must therefore be carried out by laboratories throughout the world

- In the context of standard requirements for monitoring checking equipment, every company with a Quality Management system is obliged to test and document its measuring equipment at regular intervals
- The refractometer calibration certificate documents the intended measuring functionality and confirms the measuring accuracy of your refractometer to you

Important

- Refractive index standard traceable to SRM¹ of NIST² and PTB³
- This service is not possible for the following refractometer models:
 - ORA 6HA / 6HB
 - ORA 1RE
 - ORA 4RR
 - ORA 1GG / 2GG
- Calibration of products from other manufacturers is possible on request

¹Standard reference material

²National Institute of Standards and Technology

³Physikalisch-Technische Bundesanstalt
(German metrology institute)

Model	Description	Price excl. of VAT ex works €
KERN		
961-290	Calibration certificate for refractometers on initial calibration	129,-
961-290R	Calibration certificate for refractometers on recalibration	129,-