GB

DIGITAL REFRACTOMETERS – TYPE: HAND-HELD

PROFESSIONAL MEASURING

2018

KERN Pictograms

360° rotatable microscope head

Monocular Microscope
For the inspection with one eye

Binocular Microscope
For the inspection with both eyes

Trinocular Microscope
For the inspection with both eyes and the additional option for the connection of a camera

Abbe Condenser
With high numerical aperture for the concentration and the focusing of light

Halogen illumination
For pictures bright and rich in contrast

LED illumination
Cold, energy saving and especially long-life illumination

Incident illumination
For non-transparent objects

Transmitting illumination
For transparent objects

Fluorescence illumination
For stereomicroscopes

Fluorescence illumination for compound microscopes
With 100 W mercury lamp and filter

Fluorescence illumination for compound microscopes
With 3 W LED illumination and filter

Phase contrast unit
For a higher contrast

Darkfield condenser/unit
For a higher contrast due to indirect illumination

Polarising unit
To polarise the light

Infinity system
Infinity corrected optical system

Zoom magnification
For stereomicroscopes

Parallel optical system
For stereomicroscopes, enables fatigue-proof working

Integrated scale
In the eyepiece

SD card
For data storage

USB 2.0 digital camera
For direct transmitting of the picture to a PC

USB 3.0 digital camera
For direct transmitting of the picture to a PC

WLAN data interface:
For transmitting of the picture to a mobile display device

HDMI digital camera
For direct transmitting of the picture to a display device

PC software
To transfer the measurements from the device to a PC.

Automatic temperature compesation
For measurements between 10 °C and 30 °C

Protection against dust and water splashes IPxx
The type of protection is shown by the pictogram.

Battery operation
Ready for battery operation. The battery type is specified for each device.

Battery operation rechargable
Prepared for a rechargable battery operation

Mains adapter
230V/50Hz in standard version for EU. On request GB, AUS or USA version.

Power supply
Integrated in balance. 230V/50Hz standard EU. More standards e.g. GB, AUS or USA on request.

Package shipment
The time required to manufacture the product internally is shown in days in the pictogram.

Abbreviations

C-Mount	Adapter for the connection of a camera to a trinocular microscope
FPS	Frames per second
H(S)WF	High (Super) Wide Field (Eyepiece with high eye point for wearers of glasses)
LWD	Long Working Distance
N.A.	Numerical Aperture
SLR camera	Single-Lens Reflex camera
SWF	Super Wide Field (Field number at least Ø 23 mm for 10× eyepiece)
W.D.	Working Distance
WF	Wide Field (Field number up to Ø 22 mm for 10× eyepiece)

Why you should choose a KERN microscope now!

For over 170 years, KERN & SOHN has been synonymous with high precision weighing and measuring technology. This claim is the driving force for the development of our microscope and refractometer ranges.

By working closely with you and our production partners, within 3 years we have developed a complete product range of high-quality microscopes and refractometers.

Thanks to consistent customer focus paired with smart ideas and the latest available technology we are proud to be suppliers of high-quality, durable top microscopes and refractometers, which help you to be as efficient as possible in your daily work.

When developing our microscopes we have concentrated on the very best optical quality and have used only high-quality glass and the latest technologies to achieve this. The high-quality Philips halogen and modern LED illumination produce razor-sharp images with high contrast and which will impress you with their brilliant true-colour display – you must have noticed this yourself.

Your advantages:
- all mechanical parts have been designed for a long service life
- special attention has been given to the ergonomy of our microscopes, as this allows the user to work for several hours in a comfortable position which does not cause fatigue
- our microscopes are fully-equipped and can be used immediately
- Highlight for 2018: die KERN camera software – you will be amazed at how user-friendly and intuitive it is
- and much more...

Use our practical “Check list for microscopes and refractometers”, which may help you to quickly determine specifications for the future instrument. Together with our KERN product specialist you can choose the right product for you.

If there is no suitable product in the standard range, for example, then we will of course configure an individual microscope for you.

Our aim is to develop a market-driven product solution, so with our microscope and refractometer range, the saying holds true: good quality at a competitive price! This is what we stand for and work towards, every day!

With our current 2018 product range you can benefit from improved quality and a clear reduction in price, which we have been able to achieve through more efficient production methods and increased global sales of our microscopes and refractometers and of course we pass this straight on to you

Do you have any questions about our range of microscopes and refractometers?

Your KERN customer consultants are available at any time to help you further.

I hope that you enjoy working efficiently with our KERN Optics products.

Albert Sauter, Managing Director

Your advantages

fast
- 24 hour dispatch service for products in stock – order today, on its way tomorrow
- Sales & service hotline from 8:00 am to 5:00 pm

reliable
- Up to 3 years warranty
- Certified QM system DIN EN ISO 9001

versatile
- One-stop shopping: from microscope through to refractometer – everything from one supplier
- Quick as a flash, find the product you want with the “Quick-Finder” at www.kern-sohn.com

Order hotline
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Information on current product availability, product data sheets, user instructions, useful knowledge, technical glossary and much for you to download, practical topic areas, which will guide you to the right product in your industry as well as a clever test weight and balance search engine.

Service hotline
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Online shop
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Our team of consultants will assist you
from Monday to Friday
from 8:00 am to 5:00 pm

Transport and storage case

Rear view

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

Features

- The KERN ORF refractometers are accurate and universal maintenance free digital handheld refractometers
- The large display is easy to read. Mistakes in reading are avoided
- The typical and practical design is suitable for a quick and convenient everyday use and is characterized by its easy-using and robustness
- The KERN ORF range is protected to international IP65 protection class, against dust and water splashes. After use, you can rinse the refractometer under running water
- The large, easy-to-read TFT colour display with integrated temperature display supports the user to reliably determine the measurement
- A large selection of models is available with single or multiple scales. This allows the use in various applications
- The instrument comes with an optimized software that can show a result in different scales
- The integrated automatic temperature compensation (ATC), avoids the manual conversion of the measurement. This allows a quick and efficient usage of the instrument
- Due to the fact that the refractometer has been calibrated at the factory, this guarantees that it can be used immediately for accurately measuring your sample.
- The follwoing accessory-parts are included:
  - Calibration liquid
  - Pipette
  - Storage box
  - 2 × AAA batteries
  - Leather bag
  - Small screwdriver
  - Cleaning tissue

Technical data

- Measurement temperature: 5 °C – 40 °C
- Overall dimensions W×D×H 133×65×38 mm
- Net weight approx. 200 g
- Power supply: 2 × AAA (1,5 V)
- Lifetime of the battery: approx. 3.750 measurements
- ATC (Automatic Temperature Compensation)
- Minimum sample volume: 2–3 drops
- Automatic energy management (AUTO-OFF after 90 seconds)

10

STANDARD

IP 65 BATT 1 DAY

Scope of application: Sugar

The following models are particularly suitable for the measurement of the “BRIX” value. They are used to determine the sugar content in food, especially in fruit, vegetables, juice and sweet or soft drinks. In the same ideal way, these refractometers serve in monitoring processes in the industry (coolant monitoring, oils, lubricants and fats). Alternativly, the dispaly can be switched to show 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 **KERN**	Scales	Measuring range	Accuracy	Division	**Price** excl. of VAT ex works **€**
ORF 45BM	Brix Refractive index	0 – 45 % 1,3330 – 1,4098 nD	± 0,2 % ± 0,0003 nD	0,1 % 0,0001 nD	**340,–**
ORF 92BM	Brix Refractive index	58 – 92 % 1,4370 – 1,5233 nD	± 0,2 % ± 0,0003 nD	0,1 % 0,0001 nD	**370,–**
ORF 85BM	Brix Refractive index	0 – 85 % 1,3330 – 1,5100 nD	± 0,2 % ± 0,0003 nD	0,1 % 0,0001 nD	**395,–**

Scope of application: Honey

The following models are particularly suitable for the measurement of the “BRIX” value, 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 the refractive index.

The main scope of applications is:
- Beekeeping
- Honey production

Model **KERN**	Scales	Measuring range	Accuracy	Division	**Price** excl. of VAT ex works **€**
ORF 92HM	Brix Baumé Water content Refractive index	58 – 92 % 38 – 43 °Bé 13 – 25 % 1,4370 – 1,5233 nD	± 0,2 % ± 0,2 °Bé ± 0,2 % ± 0,0003 nD	0,1 % 0,1 °Bé 0,1 % 0,0001 nD	**370,–**

Scope of application: Salt

The following models are particularly suitable to determin the concentration of NaCl (salt) in water. 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 the refractive index.

The main scope of applications is:
- Food industry
- Restaurants, and large-scale catering establishment, canteens

Model **KERN**	Scales	Measuring range	Accuracy	Division	**Price** excl. of VAT ex works **€**
ORF 3SM	Brix Salt (NaCl) Refractive index	0 – 45 % 0 – 28 % 1,3330 – 1,4100 nD	± 0,2 % ± 0,2 % ± 0,0003 nD	0,1 % 0,1 % 0,0001 nD	**340,–**

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.

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 **KERN**	Scales	Measuring range	Accuracy	Division	**Price** excl. of VAT ex works **€**
ORF 2WM	Mass SW Vol. AP Oechsle KMW (Babo)	0 – 35 % 0 – 22 % 0 – 150 °Oe 0 – 25 °KMW	± 0,2 % ± 0,2 % ± 1 °Oe ± 0,2 °KMW	0,1 % 0,1 % 1 °Oe 0,1 °KMW	**340,–**

Scope of application: Urine

The following models are particularly suitable for the measurement of the specific gravity (sg) in urine, the quantitiy 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)

Model **KERN**	Scales	Measuring range	Accuracy	Division	**Price** excl. of VAT ex works **€**
ORF 1PM	Serum protein Urine (spec. gravity) Refractive index	0 – 12 g/dl 1,000 – 1,050 sgU 1,3330 – 1,3900 nD	± 0,1 g/dl ± 0,001 sgU ± 0,0003 nD	0,1 g/dl 0,001 sgU 0,001 nD	**340,–**

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 fountain solution (CW). Furthermore these models are suitable for the measurement of thermal exchange systems.

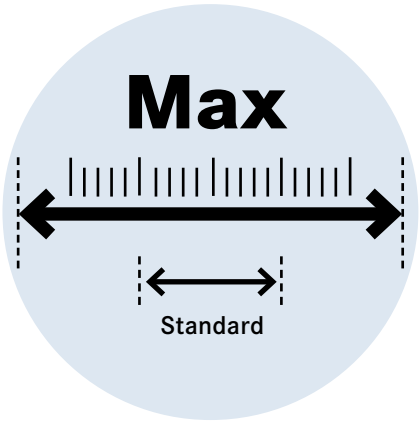
The main scope of applications is:
- Automotive industry: Car-workshops and producers
- Chemical industry
- Solar industry: Antifreeze monitoring
- Geothermal industry: Brine-concentration-measurement for ground heat
- Forestry/Lumbermen

Model **KERN**	Scales	Measuring range	Accuracy	Division	**Price** excl. of VAT ex works **€**
ORF 2UM	EG PG BF CW	-50 – 0 °C -50 – 0 °C 1.00 – 1.50 kg/l -40 – 0 °C	± 0,5 °C ± 0,5 °C ± 0,01 kg/l ± 0,5 °C	0,1 °C 0,1 °C 0,01 kg/l 0,1 °C	**340,–**
ORF 5UM	EG PG Urea CW	-50 – 0 °C -50 – 0 °C 0 – 40 % -40 – 0 °C	± 0,5 °C ± 0,5 °C ± 0,2 % ± 0,5 °C	0,1 °C 0,1 °C 0,1 % 0,1 °C	**340,–**
ORF 6US NEW	Urea Refractive index	0 – 40 % 1,3330–1,4100 nD	± 0,2 % ± 0,0003 nD	0,1 % 0,0001 nD	**340,–**

NEW New model

Scope of application: Expert applications

The following model has a special large measuring range for the refractive index.



The main scope of applications is:
- Universal measuring instrument, especially for applications with extra large measuring ranges

Model KERN	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
ORF 1RS	Refractive index	1,3330 – 1,5400 nD	± 0,0005 nD	0,0001 nD	**430,–**

Accessory parts: Digital refractometer – ORF

Model KERN	Description	Price excl. of VAT ex works €
ORF-A1005	Prism cover for digital refractometers	**25,–**
ORA-A1001	Calibration liquid – distilled water Volume: 2,5 ml	**19,–**
ORA-A1006	Calibration liquid – Triethyl citrate Volume: 2,5 ml	**19,–**
ORD-A2104	Leather bag for digital refractometer (Spare part)	**19,–**

Price reduction

Calibration liquid/
Contact liquid

Relationship overview – refractometer calibration (digital)					
Model refractometer	Calibration value	Calibration liquid	Article number liquid	Calibration block	Article number calibration block
ORF 45BM; ORF 85BM; ORF 3SM	0 % Brix	distilled water	ORA-A1001	–	–
ORF 2WM	0 °KMW	distilled water	ORA-A1001	–	–
ORF 1PM; ORF 1RS	1,3330 nD	distilled water	ORA-A1001	–	–
ORF 2UM; ORF 5UM	0 °C EG/PG/CW	distilled water	ORA-A1001	–	–
ORF 6US	0 % Urea	distilled water	ORA-A1001	–	–
ORF 92BM; ORF 92HM	60 % Brix	Triethyl citrate CAS 77-93-0	ORA-A1006	–	–

KERN – Tradition and Innovation for over 170 years

An independent family business, KERN since already 8 generations is synonymous with quality and reliability in customer service.

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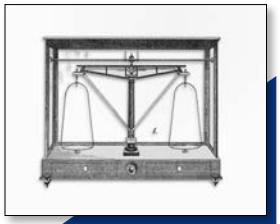

1844

KERN is founded – precision balances are produced

1863

A proud Gottlieb Kern with his staff

1880

Pharmaceutical balance with Aesculap

1923

Inflation – KERN wages are paid with self printed currency

1980

The electronic balance ousts mechanical devices

1994

Accredited DKD laboratory (ISO 17025)

2000

New premises in Balingen

2002

Existing QM system certification in accordance with DIN EN ISO 9001:2000 standards

2007

Approval for the manufacture of medical products (DIN EN 13485 and 93/42/EEC)

2008

Authorisation for initial verification by the manufacturer (2009/23/EC)

2009

Approval for the manufacture and sale of height rods (DIN EN 13485 and 93/42/EEC)

2012

Verification point for non-automatic balances and test weights.

New customer portal www.kern-sohn.com goes live

2014

Expansion of the product range to include optical instruments (microscopes and refractometers)

2015

Inauguration of Ziegelei 2.0 with computer-controlled high-bay warehouse

2017

Come with KERN into the digital future: Expansion of the model ranges compatible with Industry 4.0, as well as the related services

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