ABBE REFRACTOMETERS
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 the inspection of fluorescent samples

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 compensation
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 rechargeable
Prepared for a rechargeable battery operation

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

Power supply
Integrated in microscope. 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.

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 ∅ 23 mm for 10× eyepiece)

W.D.
Working Distance

WF
Wide Field (Field number up to ∅ 22 mm for 10× eyepiece)

Abbreviations
Why you should choose a KERN microscope now!

For 175 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.

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 2020: die KERN camera software – you will be amazed at how user-friendly and intuitive it is, a high-quality tablet camera as well as a comprehensive range of calibration services for refractometers
- 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 2020 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

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**Order hotline**
+49 7433 9933-0

**Service hotline**
+49 7433 9933-199

**Online shop**
www.kern-sohn.com

**E-mail order**
info@kern-sohn.com

**Fax Order**
+49 7433 9933-146

**Our team of consultants will assist you**
from Monday to Friday
from 8:00 am to 5:00 pm

**www.kern-sohn.com**
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 microscopes and refractometers search engine.
Refractive index measurement for pharmacy, laboratories and industry

**Features**

- The KERN ORT refractometers are universal analog Abbe refractometers.
- The handy and robust design allows the easy, efficient and sustainable use in everyday life.
- The integrated scale allows the use in different applications and provides the best possible security to read the measurement results accurately.
- The scope of delivery includes:
  - Calibration solution
  - Calibration block
  - Pipette
  - Small screwdriver
  - Cleaning tissue
  - Digital thermometer
- Accessories are available as options.

**Technical data**

- Measurement temperature: 20 °C
- Overall dimensions W×D×H 180×90×240 mm
- Net weight approx. 1950 g

! Now also available with calibration certificate, see page 114!
Abbe refractometer KERN ORT-1

Scope of application: Industry/Pharmacy/Laboratory

The following model is a simple yet highly reliable Abbe refractometer with a digital thermometer. Liquid, solid and pasty samples can be evaluated. This refractometer is robust, accurate and easy to use. Optionally a solide aluminium case for transport and storage is available. It measures the refractive index (nD).

The main scope of applications is:
- Sugar industry: for example cane sugar
- Pharmacy
- Beverage industry
- Food industry
- Chemical industry
- Oil industry/Refinery
- Laboratories
- Training

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price excl. of VAT ex works €</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORT 1RS</td>
<td>Brix Refractive index</td>
<td>690,–</td>
</tr>
<tr>
<td></td>
<td>0 – 95 % 1,3000 – 1,7000 nD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>± 0,1 % ± 0,0002 nD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0,25 % 0,0005 nD</td>
<td></td>
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</table>

Accessory parts: Abbe refractometer – ORT

<table>
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<tr>
<th>Model</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ORA-A1102</td>
<td>Aluminium suitcase  Dimension: 310×120×240 mm, weight: 1300 g</td>
<td>80,–</td>
</tr>
<tr>
<td>ORA-A2266</td>
<td>Digital thermometer (0 °C/50 °C) (Spare part)</td>
<td>60,–</td>
</tr>
<tr>
<td>ORA-A2267</td>
<td>Calibration block for ORT 1RS</td>
<td>40,–</td>
</tr>
<tr>
<td>ORA-A1107</td>
<td>Contact liquid – Alpha-Bromonaphthalene (Refractive index: 1,65 nD) Volume: 2,5 ml</td>
<td>25,–</td>
</tr>
<tr>
<td>ORA-A3001</td>
<td>Contact liquid – Diiodomethane “Pro” (Refractive index: 1,79 nD) Volume: 2 ml</td>
<td>35,–</td>
</tr>
</tbody>
</table>

Relationship overview – refractometer calibration (Abbe)

<table>
<thead>
<tr>
<th>Model refractometer</th>
<th>Calibration value</th>
<th>Calibration liquid</th>
<th>Article number liquid</th>
<th>Calibration block</th>
<th>Article number calibration block</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORT 1RS</td>
<td>engraved on the block (nD value)</td>
<td>Alpha-Bromonaphthalene CAS 90-11-9</td>
<td>ORA-A1107</td>
<td>yes</td>
<td>ORA-A2267</td>
</tr>
</tbody>
</table>
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
  - ORA 1GG
- Calibration of products from other manufacturers is possible on request.

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<tr>
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<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>961-290</td>
<td>Calibration certificate for refractometers on initial calibration</td>
<td>99,–</td>
</tr>
<tr>
<td>961-290R</td>
<td>Calibration certificate for refractometers on recalibration</td>
<td>99,–</td>
</tr>
</tbody>
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¹Standard reference material
²National Institute of Standards and Technology
³Physikalisch-Technische Bundesanstalt
(German metrology institute)
KERN & SOHN GmbH
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www.kern-sohn.com

1769
Ancestor Johann Jakob Sauter built the Hahn inclination scale out of iron, a foundation stone for weighing for the balance industry in Southern Germany

1769
1844
1863
1880
1923

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.

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

2019
Significant anniversary year! 25 years of accredited DKD laboratory 175 years of KERN & SOHN 250 years of balance manufacture in the Sauter family-owned company

2020
Construction of Ziegelei 3.0, extension of administration building