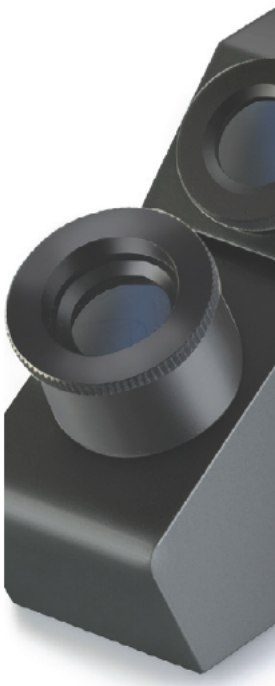

REFRACTOMETERS
POLARIMETERS

11 – 14

Also available with calibration certificate, see page 108!

Refractive index measurement for laboratories and the industry

Features

- The KERN ORA refractometers are universal, maintenance-free analogue handheld refractometers
- The handy and robust design allows the easy, efficient and sustainable use in everyday life
- Manually calculated conversions and errors of the user are avoided by multiple selectable scales
- These scales are especially developed, exactly calculated and checked. They are also characterized by their thin and clear lines
- The optical system and the prism cover are made of special material which allows a low-tolerance measuring
- All ORA models are equipped with an eyepiece for easy and smooth setting for many different diopter strengths
- The models marked with "ATC" have an automatic temperature compensation which enables accurate measurement at different ambient temperatures (10 °C/30 °C)
- The following accessory-parts are included:
  - Storage box
  - Calibration liquid
  - Calibration block (if required)
  - Pipette
  - Screwdriver
  - Cleaning tissue
- Further accessories are optionally available

Technical data

- Die-cast housing of copper-aluminium alloy, chrome coated
- Measurement temperature without ATC: 20 °C
- Measurement temperature range with ATC: 10 °C/30 °C
- Dimensions of the box: 205×75×55 mm (depending on the model)
- Product length: approx. 130 – 200 mm (depending on the model)
- Net weight approx. 135 – 600 g (depending on the model)

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STANDARD 1 DAY

OPTION AUTO ATC

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 soft drinks. In the same ideal way these refractometers serve for monitoring processes in the industry (coolant monitoring, oils, water-based mixtures).

The main scope of applications is:
- Industry: Monitoring of lubricants for process and quality control
- Food industry: Beverages, fruits and sweets
- Agriculture: Determination of the degree of ripeness of fruits for quality control in harvesting
- Restaurants and large-scale catering establishment

Model	Scales	Measuring range	Division	ATC
KERN				
ORA 10BB	Brix	0 – 10 %	0,1 %	
ORA 10BA	Brix	0 – 10 %	0,1 %	✔
ORA 20BB	Brix	0 – 20 %	0,1 %	
ORA 20BA	Brix	0 – 20 %	0,1 %	✔
ORA 32BB	Brix	0 – 32 %	0,2 %	
ORA 32BA	Brix	0 – 32 %	0,2 %	✔
ORA 62BB	Brix	28 – 62 %	0,2 %	
ORA 62BA	Brix	28 – 62 %	0,2 %	✔
ORA 82BB	Brix	45 – 82 %	0,5 %	
ORA 80BB	Brix	0 – 80 %	0,5 %	

Scope of application: Honey

The following models are particularly suitable for the measurement of the "BRIX" value, as well as the water content in honey and "degrees Baumé" to determine the relative density of liquids.

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

Model	Scales	Measuring range	Division	ATC
KERN				
ORA 3HB	Brix Baumé Water content	58 – 92 % 38 – 43 °Bé 12 – 27 %	0,5 % 0,5 °Bé 1 %	
ORA 3HA	Brix Baumé Water content	58 – 92 % 38 – 43 °Bé 12 – 27 %	0,5 % 0,5 °Bé 1 %	✔
ORA 6HB*	Water content according to AOAC standard	12 – 30 %	0,1 %	
ORA 6HA*	Water content according to AOAC standard	12 – 30 %	0,1 %	✔

*no calibration certificate possible

Scope of application: Salt

The following models are particularly suitable for the measurement and concentration control of the mass fraction of natrium chloride in water as well as of the content of NaCl (salt) in water. This is often used in the preparation and 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.

The main scope of applications is:
- Food industry
- Restaurants and large-scale catering establishment
- Aquaristic: Fishkeepers/Fishfarmers in sea and sweetwater

Model	Scales	Measuring range	Division	ATC
KERN				
ORA 1SB	Salt content (NaCl) ‰ specific gravity	0 – 100 ‰ 1,000 – 1,070 sg	1 ‰ 0,001 sg	
ORA 1SA	Salt content (NaCl) ‰ specific gravity	0 – 100 ‰ 1,000 – 1,070 sg	1 ‰ 0,001 sg	✔
ORA 3SB	Salt content (NaCl) % Brix	0 – 28 % 0 – 32 %	0,2 % 0,2 %	
ORA 3SA	Salt content (NaCl) % Brix	0 – 28 % 0 – 32 %	0,2 % 0,2 %	✔

Scope of application: Wine

The following models are particularly suitable for the measurement of the content of sugar in fruits. 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 and fruit-growing
- Wine-production
- Must and alcohol production

°Oe = Degree Oechsle, °KMW = Klosterneuburger Must balance

Model	Scales	Measuring range	Division	ATC
KERN				
ORA 1WB	Oechsle KMW (Babo) Brix	0 – 140 °Oe 0 – 25 °KMW 0 – 32 %	1 °Oe 0,25 °KMW 0,2 %	
ORA 1WA	Oechsle KMW (Babo) Brix	0 – 140 °Oe 0 – 25 °KMW 0 – 32 %	1 °Oe 0,25 °KMW 0,2 %	✔
ORA 3WB	Oechsle Brix	30 – 140 °Oe 0 – 32 %	1 °Oe 0,2 %	
ORA 3WA	Oechsle Brix	30 – 140 °Oe 0 – 32 %	1 °Oe 0,2 %	✔

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 SG Wort 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	Division	ATC
KERN				
ORA 3AB	Brix Original gravity (specific weight)	0 – 32 % 1,000 – 1,130	0,2 % 0,001	
ORA 3AA	Brix Original gravity (specific weight)	0 – 32 % 1,000 – 1,130	0,2 % 0,001	✔
ORA 4AB	Plato	0 – 18° P	0,1° P	
ORA 4AA	Plato	0 – 18° P	0,1° P	✔
ORA 1AB	Percentage by volume Percentage by volume	0 – 50 % (v/v) 50 – 80 % (v/v)	1 % (v/v) 2,5 % (v/v)	
ORA 2AB	Percentage by mass Percentage by mass	0 – 50 % (w/w) 50 – 80 % (w/w)	1 % (w/w) 2,5 % (w/w)	

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)
- Veterinary

Model	Scales	Measuring range	Division	ATC
KERN				
ORA 2PB	Serum protein Urine (spec. gravity) Refractive index	0 – 12 g/100 ml 1,000 – 1,050 1,3330 – 1,3600 nD	0,2 g/100 ml 0,002 0,0005 nD	
ORA 2PA	Serum protein Urine (spec. gravity) Refractive index	0 – 12 g/100 ml 1,000 – 1,050 1,3330 – 1,3600 nD	0,2 g/100 ml 0,002 0,0005 nD	✔
ORA 5PB	Serum protein Urine (s. g. dog) Urine (s. g. cat)	2 – 14 g/100 ml 1,000 – 1,060 1,000 – 1,060	0,1 g/100 ml 0,001 0,001	

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.

The main scope of applications is:

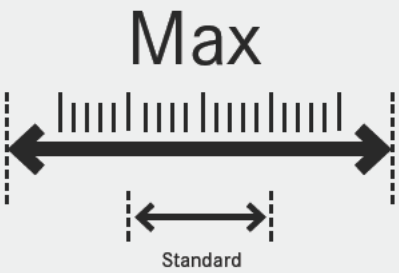
- Automotive industry: Car-workshops and producers, in accordance with the VW standards G11/G12 and G13
- Chemical industry
- Solar industry: Antifreeze monitoring

Model	Scales	Measuring range	Division	ATC
KERN				
ORA 4FB	Ethylene glycol (G11/12) Propylene glycol (G13) Windshield washer fluid Battery fluid	-50 – 0 °C -50 – 0 °C -40 – 0 °C 1,10 – 1,40 kg/l	1 °C 1 °C 5 °C 0,01 kg/l	
ORA 4FA	Ethylene glycol (G11/12) Propylene glycol (G13) Windshield washer fluid Battery fluid	-50 – 0 °C -50 – 0 °C -40 – 0 °C 1,10 – 1,40 kg/l	1 °C 1 °C 5 °C 0,01 kg/l	✔
ORA 1UB	Urea	0 – 40 %	0,2 %	
ORA 1UA	Urea	0 – 40 %	0,2 %	✔
ORA 4UB	Urea Ethylene glycol (G11/12) Propylene glycol (G13) Windshield washer fluid Battery fluid	30 – 35 % -50 – 0 °C -50 – 0 °C -40 – 0 °C 1,10 – 1,40 kg/l	0,2 % 1 °C 1 °C 5 °C 0,01 kg/l	
ORA 4UA	Urea Ethylene glycol (G11/12) Propylene glycol (G13) Windshield washer fluid Battery fluid	30 – 35 % -50 – 0 °C -50 – 0 °C -40 – 0 °C 1,10 – 1,40 kg/l	0,2 % 1 °C 1 °C 5 °C 0,01 kg/l	✔

Order Hotline: Go to back page of catalogue

Scope of application: Expert applications

The following models have a special large measuring range for the refractive index and large divided scales for the measurement and clear reading of Brix values.



The main scope of applications is:
- Universal application, especially when extra large measuring ranges are required

Model	Scales	Measuring range	Division	ATC
KERN				
ORA 80BE	Brix	0 – 50 % 50 – 80 %	0,5 % 0,5 %	
ORA 90BE	Brix	0 – 42 % 42 – 71 % 71 – 90 %	0,2 % 0,2 % 0,2 %	
ORA 1RE*	Refractive index	1,333 – 1,405 nD 1,405 – 1,468 nD 1,468 – 1,517 nD	0,005 nD 0,005 nD 0,005 nD	
ORA 4RR*	Refractive index	1,440 – 1,520 nD	0,001 nD	

*no calibration certificate possible


ORA 4RR


ORA 90 BE/ORA 1RE


ORA 80BE

Scope of application: Gemmology/Jewellery

The Gem models have a special refracting-index range for jewellery. For this refractometer there is a nice leather bag in the scope of delivery included.

The main scope of applications is:
- Jewellers
- Training/Education
- Jewellery industry

Model	Scales	Measuring range	Division	ATC
KERN				
ORA 1GG*	Refractive index	1,30 – 1,81 nD	0,01 nD	

*no calibration certificate possible


ORA 1GG

Accessory parts: Analogue refractometer – ORA

Prism coverplate with LED
ORA-A1101

Calibration liquid/
Contact liquid

Leather bag
ORA-A2103

Calibration block

Model	Description
KERN	
ORA-A1101	Prism coverplate with integrated LED illumination
ORA-A2103	Leather bag for analog refractometers
ORA-A2107	Leather bag for Gem refractometers (Spare part)
ORA-A1010	Calibration liquid – distilled water – Set of 5 Volume: 5× approx. 3 ml
ORA-A1002	Contact liquid – Clove oil (for Calibration value 19,6%) Volume: approx. 2 ml
ORA-A1003	Calibration liquid – saturated salt solution Volume: approx. 2 ml
ORA-A1004	Contact liquid – Clove oil (for Calibration value 78,8%) Volume: approx. 2 ml
ORA-A1005	Calibration block for models ORA 82BB, ORA 3HA, ORA 3HB, ORA 6HA, ORA 6HB , ORA 4RR
ORA-A1007	Contact liquid – Diiodomethane “Standard” (Refractive index: 1,74 nD) Volume: approx. 2 ml
ORA-A3001	Contact liquid – Diiodomethane “Pro” (Refractive index: 1,79 nD) Volume: approx. 2 ml
ORA-A1008	Calibration block for model ORA 1GG
ORA-A2001	Prism coverplate (spare part)

Relationship overview – refractometer calibration (analogue)

Model refractometer	Calibration value	Calibration liquid	Article number liquid	Calibration block	Article number calibration block
ORA 10BA; ORA 10BB; ORA 18BB; ORA 1WA; ORA 1WB; ORA 20BA; ORA 20BB; ORA 32BA; ORA 32BB; ORA 3SA; ORA 3SB; ORA 3WA; ORA 3WB; ORA 7WA; ORA 80BB; ORA 80BE; ORA 3AB; ORA 3AA	0 % Brix	distilled water	ORA-A1010	–	–
ORA 4AA; ORA 4AB	0 ° Plato	distilled water		–	
ORA 1UA; ORA 1UB	0 % Urea	distilled water		–	
ORA 4FA; ORA 4FB; ORA 4UA; ORA 4UB	0 °C EG/PG/CW	distilled water		–	
ORA 1SA; ORA 1SB	0 ‰ Salinity	distilled water	ORA-A1010	–	–
ORA 2SA; ORA 2SB	0 % Salt (NaCl)	distilled water		–	
ORA 2AB	0 % Vol (weight)	distilled water		–	
ORA 2PA; ORA 2PB; ORA 5PB	1,000 sg Urine	distilled water		–	
ORA 62BA; ORA 62BB	29,6 % Brix	saturated salt solution	ORA-A1003	–	–
ORA 3HA; ORA 3HB; ORA 82BB	78,8 % Brix	Clove oil CAS 8000-34-8	ORA-A1004	yes	ORA-A1005
ORA 4RR	1,4875 nD	Clove oil CAS 8000-34-8	ORA-A1004	yes	ORA-A1005
ORA 6HA; ORA 6HB	19,6 % Water content	Clove oil CAS 8000-34-8	ORA-A1002	yes	ORA-A1005
ORA 1GG	1,515 nD	Diiodomethane CAS 90-11-9	ORA-A1007	yes	ORA-A1008

Order Hotline: Go to back page of catalogue

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 follwoing accessory-parts are included:
  - Prism cover lid
  - Pipette
  - Storage box
  - 1×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×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

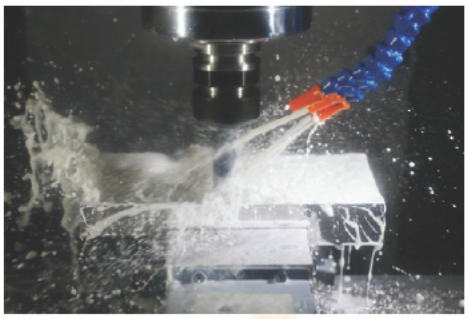
- Calibration liquid

Also available with calibration certificate, see page 108!

STANDARD

AUTO ATC | IP 65 | BATT | 1 DAY

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
KERN				
ORM 50BM	Brix Refractive index	0 – 50 % 1,3330 – 1,4200 nD	± 0,2 % ± 0,0003 nD	0,1 % 0,0001 nD
ORM 1RS	Brix Refractive index	0 – 90 % 1,3330 – 1,5177 nD	± 0,2 % ± 0,0003 nD	0,1 % 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

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Model	Scales	Measuring range	Accuracy	Division
KERN				
ORM 1SU	Fructose	0 – 69 %	± 0,2 %	0,1 %
	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 %
	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
KERN				
ORM 1HO	Brix	5 – 38 %	± 0,2 %	0,1 %
	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 determin 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
KERN				
ORM 1NA	Salt content (NaCl) %	0 – 28 %	± 0,2 %	0,1 %
	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 ‰
	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
KERN				
ORM 1AL	Percentage by mass	0 – 72 %	± 1 %	1 %
	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
	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

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

Model	Scales	Measuring range	Accuracy	Division
KERN				
ORM 1WN	Oechsle	0 – 150 °Oe	± 2 °Oe	1 °Oe
	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
	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
KERN				
ORM 1CO	Coffee TDS 1	0 – 25 %	± 0,2 %	0,1 %
	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 %
	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 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)
- Veterinary

Model	Scales	Measuring range	Accuracy	Division
KERN				
ORM 1UN	Urine (spec. gravity)	1,000 – 1,050	± 0,002	0,001
	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
	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
KERN				
ORM 1CA	Wash water	(-60) – 0 °C	± 0,5 °C	0,1 °C
	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 %
	Refractive index	1,3330 – 1,4200 nD	± 0,0003 nD	0,0001 nD
ORM 2CA	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 follwoing 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
- ORA-A1010 Calibration liquid

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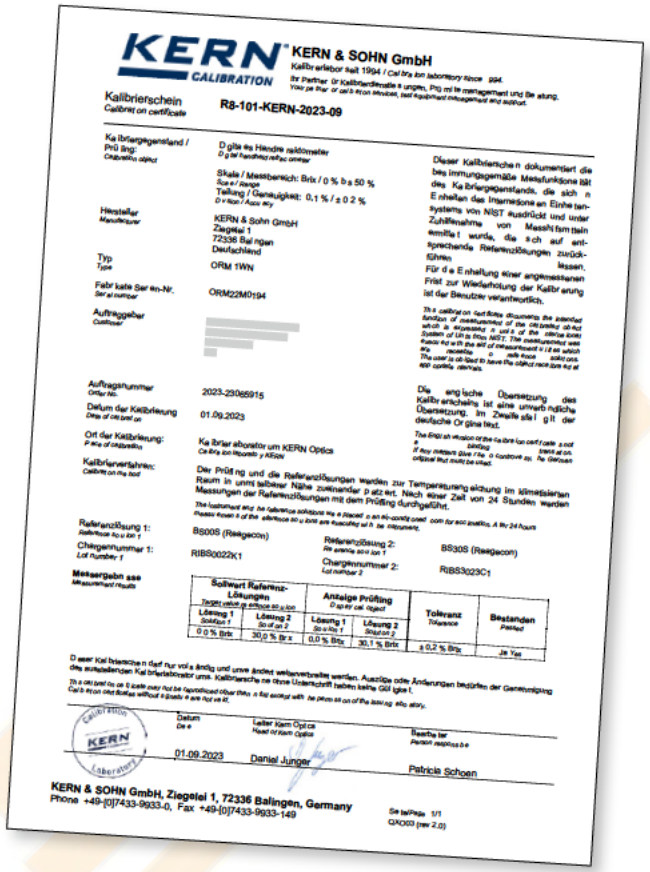
Also available with calibration certificate, see page 108!

STANDARD: AUTO ATC · USB 2.0 · 1 DAY
OPTION: RECHARGE

Model	Scales	Measuring range	Accuracy	Division
KERN				
ORL 94BS	Brix Refractive index	0 – 94 % 1,3330 – 1,5290 nD	± 0,1 % ± 0,0002 nD	0,1 % 0,0001 nD


KERN & SOHN GmbH
CALIBRATION
Kalibrierschein
Calibrat on certificate
R8-101-KERN-2023-09
Hersteller
Manufacturer
KERN & Sohn GmbH
Ziegelei 1
72336 Bal ngen
Deutschland
Typ
Type
ORM 1WN
Fabr kate Ser en-Nr.
Ser al number
ORM22M0194
Auftraggeber
Customer
Auftragsnummer
Order No.
2023-23085915
Datum der Kalibrierung
Date of cal brat on
01.09.2023
Ort der Kalibrierung:
P ace of cal brat on
Ka brier aborator um KERN Optics
Ca brat on aboratory KERN
Kalibrierverfahren:
Calibrat on the tod
Der Prüf ng und die Referenzlösungen wurden zur Temperierung eichung im klimatisierten Raum in unmi elbarer Nähe zueinander p atz ert. Nach einer Zeit von 24 Stunden wurden Messungen der Referenzlösungen mit dem Prüfling durchgeführt.
Referenzlösung 1:
Chargennummer 1:
BS00S (Reagecon)
RIBS0022K1
Referenzlösung 2:
Chargennummer 2:
BS30S (Reagecon)
RIBS3023C1
Messergebn sse
Soll-Wert Referenz-Lösungen
Anzeige Prüfling
Toleranz
Bestanden
Lösung 1
Lösung 2
0,0 % Brix
30,0 % Brix
0,0 % Brix
30,1 % Brix
± 0,2 % Brix
Ja Yes
Datum
Date
01.09.2023
Leiter Kern Optics
Head of Kern Optics
Daniel Junger
Bearbe ter
Patricia Schoen
KERN & SOHN GmbH, Ziegelei 1, 72336 Balingen, Germany
Phone +49-[0]7433-9933-0, Fax +49-[0]7433-9933-149

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 SRM[1] of NIST[2] and PTB[3]
- 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

[1]Standard reference material
[2]National Institute of Standards and Technology
[3]Physikalisch-Technische Bundesanstalt (German metrology institute)

Model	Description
KERN	
961-290	Calibration certificate for refractometers on initial calibration
961-290R	Calibration certificate for refractometers on recalibration