REFRACTOMETERS
POLARIMETERS

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Also available with calibration certificate, see page 109!

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 follwoing 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)

STANDARD OPTION

1 DAY 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 **KERN**	Scales	Measuring range	Division	ATC	**Price** excl. of VAT ex works **€**
ORA 10BB	Brix	0 – 10 %	0,1 %		**90,–**
ORA 10BA	Brix	0 – 10 %	0,1 %	✓	**95,–**
ORA 18BB	Brix	0 – 18 %	0,1 %		**90,–**
ORA 20BB	Brix	0 – 20 %	0,1 %		**90,–**
ORA 20BA	Brix	0 – 20 %	0,1 %	✓	**95,–**
ORA 32BB	Brix	0 – 32 %	0,2 %		**90,–**
ORA 32BA	Brix	0 – 32 %	0,2 %	✓	**95,–**
ORA 62BB	Brix	28 – 62 %	0,2 %		**90,–**
ORA 62BA	Brix	28 – 62 %	0,2 %	✓	**95,–**
ORA 82BB	Brix	45 – 82 %	0,5 %		**90,–**
ORA 80BB	Brix	0 – 80 %	0,5 %		**90,–**

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 **KERN**	Scales	Measuring range	Division	ATC	**Price** excl. of VAT ex works **€**
ORA 3HB	Brix Baumé Water content	58 – 92 % 38 – 43 °Bé 12 – 27 %	0,5 % 0,5 °Bé 1 %		**99,–**
ORA 3HA	Brix Baumé Water content	58 – 92 % 38 – 43 °Bé 12 – 27 %	0,5 % 0,5 °Bé 1 %	✓	**105,–**
ORA 6HB	Water content	12 – 30 %	0,1 %		**110,–**
ORA 6HA	Water content	12 – 30 %	0,1 %	✓	**115,–**

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 **KERN**	Scales	Measuring range	Division	ATC	**Price** excl. of VAT ex works **€**
ORA 1SB	Salinity specific gravity	0 – 100 ‰ 1,000 – 1,070 sg	1 ‰ 0,001 sg		**90,–**
ORA 1SA	Salinity specific gravity	0 – 100 ‰ 1,000 – 1,070 sg	1 ‰ 0,001 sg	✓	**95,–**
ORA 2SB	Salt (NaCl)	0 – 28 %	0,2 %		**90,–**
ORA 2SA	Salt (NaCl)	0 – 28 %	0,2 %	✓	**95,–**
ORA 3SB	Salt (NaCl) Brix	0 – 28 % 0 – 32 %	0,2 % 0,2 %		**90,–**
ORA 3SA	Salt (NaCl) Brix	0 – 28 % 0 – 32 %	0,2 % 0,2 %	✓	**95,–**

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 **KERN**	Scales	Measuring range	Division	ATC	**Price** excl. of VAT ex works **€**
ORA 1WB	Oechsle KMW (Babo) Brix	0 – 140 °Oe 0 – 25 °KMW 0 – 32 %	1 °Oe 0,25 °KMW 0,2 %		**90,–**
ORA 1WA	Oechsle KMW (Babo) Brix	0 – 140 °Oe 0 – 25 °KMW 0 – 32 %	1 °Oe 0,25 °KMW 0,2 %	✓	**95,–**
ORA 3WB	Oechsle Brix	30 – 140 °Oe 0 – 32 %	1 °Oe 0,2 %		**90,–**
ORA 3WA	Oechsle Brix	30 – 140 °Oe 0 – 32 %	1 °Oe 0,2 %	✓	**95,–**
ORA 7WB	Oechsle KMW (Babo) Brix	30 – 140 °Oe 0 – 25 °KMW 0 – 32 %	1 °Oe 0,2 °KMW 0,2 %		**90,–**
ORA 7WA	Oechsle KMW (Babo) Brix	30 – 140 °Oe 0 – 25 °KMW 0 – 32 %	1 °Oe 0,2 °KMW 0,2 %	✓	**95,–**

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 **KERN**	Scales	Measuring range	Division	ATC	**Price** excl. of VAT ex works **€**
ORA 3AB	Brix SG Wort	0 – 32 % 1,000 – 1,130 sgW	0,2 ‰ 0,001 sgW		**90,–**
ORA 3AA	Brix SG Wort	0 – 32 % 1,000 – 1,130 sgW	0,2 ‰ 0,001 sgW	✓	**95,–**
ORA 4AB	Plato	0 – 18° P	0,1° P		**90,–**
ORA 4AA	Plato	0 – 18° P	0,1° P	✓	**95,–**
ORA 1AB	Percentage by volume Percentage by volume	0 – 50 % (v/v) 50 – 80 % (v/v)	1 % (v/v) 2,5 % (v/v)		**90,–**
ORA 2AB	Percentage by mass Percentage by mass	0 – 50 % (w/w) 50 – 80 % (w/w)	1 % (w/w) 2,5 % (w/w)		**90,–**

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 **KERN**	Scales	Measuring range	Division	ATC	**Price** excl. of VAT ex works **€**
ORA 2PB	Serum protein Urine (spec. gravity) Refractive index	0 – 12 g/dl 1,000 – 1,050 sgU 1,3330 – 1,3600 nD	0,2 g/dl 0,002 sgU 0,0005 nD		**90,–**
ORA 2PA	Serum protein Urine (spec. gravity) Refractive index	0 – 12 g/dl 1,000 – 1,050 sgU 1,3330 – 1,3600 nD	0,2 g/dl 0,002 sgU 0,0005 nD	✓	**95,–**
ORA 5PB	Serum protein Urine (s. g. dog) Urine (s. g. cat)	2 – 14 g/dl 1,000 – 1,060 sgU 1,000 – 1,060 sgU	0,1 g/dl 0,001 sgU 0,001 sgU		**90,–**

Scope of application: Industry/Automotive

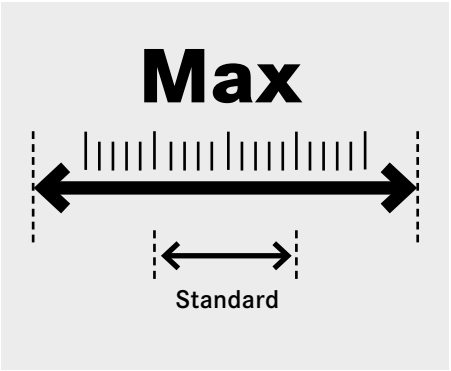
The following models are particularly suitable for the measurement and determination of AdBlue®, glycol concentration (ethylene (EG) and propylene (PG)), battery fluid (BF), urea, the freezing point of windscreen wash water (CW). Furthermore these models are suitable for the measurement of thermal exchange 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 KERN	Scales	Measuring range	Division	ATC	Price excl. of VAT ex works €
ORA 4FB	EG (G11/12) PG (G13) CW BF	-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		**90,–**
ORA 4FA	EG (G11/12) PG (G13) CW BF	-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	✓	**95,–**
ORA 1UB	Urea	0 – 40 %	0,2 %		**90,–**
ORA 1UA	Urea	0 – 40 %	0,2 %	✓	**95,–**
ORA 4UB	Urea EG (G11/12) PG (G13) CW BF	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		**90,–**
ORA 4UA	Urea EG (G11/12) PG (G13) CW BF	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	✓	**95,–**

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 KERN	Scales	Measuring range	Division	ATC	Price excl. of VAT ex works €
ORA 80BE	Brix	0 – 50 % 50 – 80 %	0,5 % 0,5 %		**160,–**
ORA 90BE	Brix	0 – 42 % 42 – 71 % 71 – 90 %	0,2 % 0,2 % 0,2 %		**360,–**
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		**360,–**
ORA 4RR	Refractive index	1,440 – 1,520 nD	0,001 nD		**95,–**


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 KERN	Scales	Measuring range	Division	ATC	Price excl. of VAT ex works €
ORA 1GG	Refractive index	1,30 – 1,81 nD	0,01 nD		**250,–**


ORA 1GG

Accessory parts: Analogue refractometer – ORA

Prism coverplate with LED
ORA-A1101

Calibration liquid/
Contact liquid

Leather bag
ORA-A2103

Calibration block

Model KERN	Description	Price excl. of VAT ex works €
ORA-A1101	Prism coverplate with integrated LED illumination	**25,–**
ORA-A2103	Leather bag for analog refractometers	**25,–**
ORA-A2107	Leather bag for Gem refractometers (Spare part)	**35,–**
ORA-A1010	Calibration liquid – distilled water – Set of 5 Volume: 5× approx. 2,5 ml	**25,–**
ORA-A1002	Contact liquid – Clove oil (for Calibration value 19,6%) Volume: approx. 2,5 ml	**25,–**
ORA-A1003	Calibration liquid – saturated salt solution Volume: approx. 2,5 ml	**25,–**
ORA-A1004	Contact liquid – Clove oil (for Calibration value 78,8%) Volume: approx. 2,5 ml	**25,–**
ORA-A1005	Calibration block for models ORA 82BB, ORA 3HA, ORA 3HB, ORA 6HA, ORA 6HB , ORA 4RR	**25,–**
ORA-A1007	Contact liquid – Diiodomethane “Standard” (Refractive index: 1,74 nD) Volume: approx. 2,5 ml	**25,–**
ORA-A3001	Contact liquid – Diiodomethane “Pro” (Refractive index: 1,79 nD) Volume: approx. 2 ml	**40,–**
ORA-A1008	Calibration block for model ORA 1GG	**25,–**
ORA-A2001	Prism coverplate (spare part)	**25,–**

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 7WB; 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

NEW

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)

Also available with calibration certificate, see page 109!

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

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 **KERN**	Scales	Measuring range	Accuracy	Division	**Price** excl. of VAT ex works **€**
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 – 1,577 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 KERN	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
ORM 1HO	Brix Baumé Water content Refractive index	5 – 38 % 33 – 48 °Bé 0 – 90 % 1,3330 – 1,5177 nD	± 0,2 % ± 0,2 °Bé ± 0,2 % ± 0,0003 nD	0,1 % 0,1 °Bé 0,1 % 0,0001 nD	470,–

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 KERN	Scales	Measuring range	Accuracy	Division	Price excl. of VAT ex works €
ORM 1NA	Salt content (NaCl) %	0 – 28 %	± 0,2 %	0,1 %	370,–
	Salt content (NaCl) ‰	0 – 280 ‰	± 2 ‰	1 ‰	
	Spec. Gravity	1,000 – 1,220	± 0,002	0,001	
	Brix	0 – 28 %	± 0,2 %	0,1 %	
	Refractive index	1,3330 – 1,4100 nD	± 0,0003 nD	0,0001 nD	
ORM 1SW	Salt content seawater	0 – 100 ‰	± 2 ‰	1 ‰	370,–
	Chlorine content seawater	0 – 57 %	± 2 ‰	1 ‰	
	Spec. Gravity	1,000 – 1,070	± 0,002	0,1 %	
	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 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

Modell **KERN**	Skalen	Messbereich	Genauigkeit	Teilung	**Preis** zzgl. MwSt. ab Werk **€**
ORM 1AL	Percentage by mass Percentage by volume Brix Refractive index	0 – 72 % 0 – 80 % 0 – 50 % 1,3330 – 1,4200 nD	± 1 % ± 1 % ± 0,2 % ± 0,0003 nD	1 % 1 % 0,1 % 0,0001 nD	**370,–**
ORM 1BR	Plato SG Wort Brix Refractive index	0 – 31 °P 1,000 – 1,130 0 – 50 % 1,3330 – 1,4200 nD	± 0,3 °P ± 0,002 ± 0,2 % ± 0,0003 nD	0,1 0,1 0,1 % 0,0001 nD	**370,–**

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 or the refractive index.

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 **€**
ORM 1WN	Oechsle Percentage by volume KMW (Babo) Brix	0 – 150 °Oe 0 – 22 % 0 – 25 °KMW 0 – 50 %	± 2 °Oe ± 0,2 % ± 0,2 °KMW ± 0,2 %	1 °Oe 0,1 % 0,1 °KMW 0,1 %	**370,–**
ORM 2WN	Oechsle France Percentage by volume KMW (Babo) Brix	0 – 230 °Oe 0 – 22 % 0 – 25 °KMW 0 – 50 %	± 2 °Oe ± 0,2 % ± 0,2 °KMW ± 0,2 %	1 °Oe 0,1 % 0,1 °KMW 0,1 %	**370,–**

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 **KERN**	Skalen	Messbereich	Genauigkeit	Teilung	**Preis** zzgl. MwSt. ab Werk **€**
ORM 1CO	Coffee TDS 1 Brix Refractive index	0 – 25 0 – 50 % 1,3330 – 1,4200 nD	± 0,2 ± 0,2 % ± 0,0003 nD	0,1 0,1 % 0,0001 nD	**370,–**
ORM 2CO	Coffee TDS 2 Brix Refractive index	0 – 25 0 – 30 1,3330 – 1,4200 nD	± 0,2 ± 0,2 ± 0,0003 nD	0,01 0,1 0,0001 nD	**370,–**

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

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.

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

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

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Transport and storage case

Rear view, screw-on battery compartment cover

IP65: Protected against dust and water splashes

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

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 PREMIUM refractometers from the KERN ORF range are 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
  - Screwdriver
  - Cleaning tissue

Technical data

- Measurement temperature: 5 °C – 40 °C
- Overall dimensions W×D×H 145×67×40 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), does not apply to the refraction index scale
- Minimum sample volume: 2–3 drops
- Automatic energy management (AUTO-OFF after 90 seconds)

Also available with calibration certificate, see page 109!

STANDARD

AUTO ATC | IP 65 | BATT | 1 DAY

Only while stocks last

Remaining stocks of this series

Successor series ORM

→ see page 101

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, **€ 65,–**

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! Also available with calibration certificate, see page 109!

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

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

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

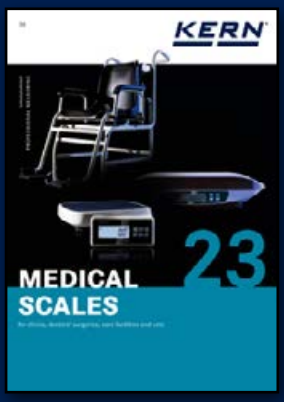
Important

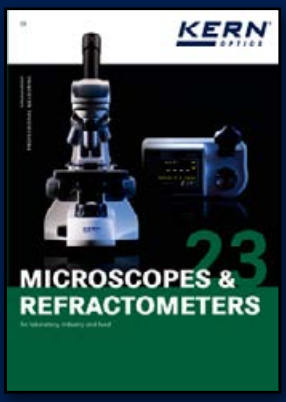
- Refractive index standard traceable to SRM[1] of NIST[2] and PTB[3]
- This service is not possible for the following refractometer models:
  - ORA 6HA
  - ORA 1GG
- Calibration of products from other manufacturers is possible on request

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

Model	Description	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,–**

ASSORTMENT RANGE LEADER AND HIDDEN CHAMPION IN THE REGION: KERN WEIGHING & MEASURING TECHNOLOGY





KERN – the king of broad product ranges

Reliable, easy, durable products from the world of weighing and measuring technology, innovative software and the competent test service from KERN and SAUTER will win you over.

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You can also place orders by going online www.kern-sohn.com

PROFESSIONAL MEASURING

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POLARIMETERS

The ideal helper for getting started with the analysis of your optically active solutions in the laboratory

Features

- The KERN OAB 10LN is a manual polarimeter which is characterised by its ergonomic design and easy handling
- The powerful 589 nm sodium vapour lamp is the optimum light source to produce a linear, polarised beam of light
- The 1° scale division including Nonius (0.05°) enables precise definition of the angle of rotation of the substance to be observed
- To hold liquid samples, two glass cuvettes (100 mm/200 mm) are included with the delivery
- Included with delivery:
  Sodium vapour lamp,100 mm glass cuvette, 200 mm Glasküvette, Replacement lenses and sealing rings for cuvettes

Technical data

- Light source: Sodium vapour lamp (589 nm)
- Stabilisation time: 10 mins after switching on
- Overall dimensions W×D×H
  500×135×330 mm
- Net weight approx. 5 kg

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STANDARD

MONO POLAR 230 V 1 DAY

Scope of application: Laboratory/Education

The reliable polarimeters in the OAB-L range have been designed for simple laboratory applications as well as practical training. You can evaluate liquid, optically-active samples with chiral characteristics with this device. Typical applications are determining kinetics in cane sugar inversion, determining mutarotation of glucose and investigation of starch hydrolysis. The optical rotation is measured in degrees.

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

Cuvette in measuring chamber

Model **KERN**	Scales	Measuring range	Division	Vernier	Wave lenght	**Price** excl. of VAT ex works **€**
OAB 10LN	Optical rotation	± 180°	1°	0,05°	589 nm	**920,–**

Accessory parts: OAB

Model **KERN**	Description	**Price** excl. of VAT ex works **€**
OAB-A2501	Glass cuvette, Length: 100 mm (Spare part)	**110,–**
OAB-A2502	Glass cuvette, Length: 200 mm (Spare part)	**110,–**
OAB-A2581	Sodium vapour lamp, Wave length: 589 mm (Spare part)	**120,–**

Cuvette 10 and 20 cm

www.kern-sohn.com

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