



## Analog polarimeter

**OAB 20LED**



PROFESSIONAL MEASURING

### Operating instructions

Version 1.0  
2025-01  
English  
OAB-LED-BA-e-2510

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**OPTICS**

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## 1 Technical data

Model KERN	OAB 20LED
Measuring range	-180° - 180°
Division	1°
Vernier	0,05°
Wavelength	589 nm
Light source	LED
Stabilization time lamp	5 minutes
Magnifying glasses	3x
Round cuvettes	100 and 200 mm
Power supply	~ 230V / 50Hz
Dimensions	500 x 135 x 330 mm
Net weight	3.1 kg
Gross weight	4.6 kg
Packaging dimensions	580 x 210 x 400 mm

## **2 Declaration of conformity**

The current EC/EU Declaration of Conformity can be found online at:  
**<https://www.kern-sohn.com/shop/de/DOWNLOADS/>**

### 3 Overview of the device

#### 3.1 Scope of delivery

After unpacking and before using for the first time, check that all parts are included in the scope of delivery. Replace damaged or defective parts immediately and do not put them into operation.

- ⇒ Analog LED polarimeter
- ⇒ Cuvette 100 mm (150 ml)
- ⇒ Cuvette 200 mm (200 ml)
- ⇒ Replacement lenses, sealing rings and locking device (set)
- ⇒ Operating instructions

#### 3.2 Nomenclature






## 4 Basic information (general)

### 4.1 General information on warnings

Warnings are used in these operating instructions to warn you of possible personal injury or damage to property in certain situations.

#### Symbols in warning notices :

Icon	Meaning
<b>Warning signs</b>	Warning signs warn you of dangers that may lead to personal injury. The symbol indicates the type of hazard.
	Indicates general hazards or a danger point
	Warning of electrical voltage

Icon	Meaning
<b>Commandment sign</b>	Mandatory signs prescribe measures that you must take to avoid personal injury or damage to property. The symbol indicates the necessary actions or objects to prevent damage.
	Indicates a prescribed action

### 4.2 Intended use

The manual polarimeter OAB-L is used to determine the concentration of optically active substances. For this purpose, the LED light with a wavelength of 589 nm is linearly polarized by means of a polarizer, passes through the solution to be examined and is observed by an analyser, whereby optically active substances rotate the polarization plane of the light. By measuring the angle of rotation with the aid of the analyzer, the concentration of the solution can now be calculated.

### 4.3 Improper use

The polarimeter is not to be used for medical purposes.

Do not use the device in potentially explosive atmospheres or for measurements in liquids or on live parts.

Unauthorized structural changes, additions or conversions to the appliance are prohibited.

## **4.4     Warranty**

Warranty expires with

- Non-compliance with our specifications in the operating instructions
- Use outside the described applications
- Modifying or opening the device
- Mechanical damage and damage caused by media, liquids, natural wear and tear
- Improper set-up or electrical installation
- Improper assembly or electrical installation

## 5 Basic warnings and safety instructions

### 5.1 Observe the notes in the operating instructions




Read the operating instructions carefully before commissioning/using the device, even if you already have experience with KERN devices. Always keep the instructions in the immediate vicinity of the appliance.

### 5.2 Staff training

The appliance may only be used by persons who have read and understood the operating instructions, particularly the chapter on safety.

### 5.3 Security

⚠ WARNING	
	<p><b>Read all safety information and instructions.</b> Failure to observe the safety information and instructions may result in electric shock, fire and/or serious injury.</p> <p><b>Keep all safety information and instructions for future reference.</b></p> <ul style="list-style-type: none"><li>• Avoid contact of acid with skin or eyes. Rinse burnt skin with plenty of water. Shower if larger areas are affected.</li><li>• If the eyes have been cauterized, rinse the eyes with lukewarm, running water from the outside to the inside with the eyelids open. Rinse the eyes for at least 15 minutes. Then consult a doctor / ophthalmologist immediately.</li><li>• Clean the polarimeter thoroughly after each use.</li><li>• The design of the measuring device must not be modified. This can lead to incorrect measurement results, safety-related defects and the destruction of the measuring device.</li><li>• Do not operate the appliance in potentially explosive rooms or areas and do not install it there.</li><li>• Protect the device from permanent direct sunlight.</li><li>• Do not expose the appliance to strong vibrations.</li><li>• Do not remove any safety signs, stickers or labels from the appliance. Keep all safety signs, stickers and labels in a legible condition.</li><li>• Do not open the device.</li><li>• Do not touch the lenses with your fingers.</li><li>• This polarimeter is not a toy, it does not belong in the hands of children.</li></ul>

⚠ WARNING	
	<p><b>Risk of injury from electric shock!</b></p> <ul style="list-style-type: none"><li>• The device may only be used in a dry environment and under no circumstances in rain or at a relative humidity above the operating conditions.</li><li>• There is a risk of short circuit due to liquids penetrating the housing!</li></ul>



- Do not immerse the device or accessories in water. Make sure that no water or other liquids get into the housing.
- Work on electrical components may only be carried out by an authorized specialist company!

 **NOTE**

- To avoid damaging the device, do not expose it to extreme temperatures, extreme humidity or moisture.
- Do not use abrasive cleaners, scouring agents or solvents to clean the appliance.

## **6 Transportation and storage**

### **Note**

If you store or transport the device improperly, the device may be damaged. Observe the information on transporting and storing the appliance.

### **Transportation**

When transporting the device, use the packaging included in the scope of delivery to protect the device from external influences.

### **Storage**

Observe the following storage conditions when the appliance is not in use:

- dry and protected from frost and heat
- the storage temperature corresponds to the technical data

### **Packaging/return transportation**

Returns are only possible within the limits of the general terms and conditions. Keep all parts in the original packaging for any necessary return transportation.

- Only the original packaging is to be used for return transportation.
- Disconnect all connected cables and loose/movable parts before shipping.
- Refit any transportation locks provided.
- Secure all parts against slipping and damage.

## 7 Unpacking and commissioning

### 7.1 Unpacking

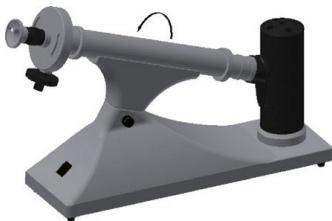


In the event of a return, please observe the instructions in the chapter "Packaging/return transportation"

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On receipt of the device, you should first check that no transport damage has occurred and that the outer packaging, the housing, other parts or even the device itself have not been damaged. If any damage is evident, please inform the KERN service team immediately.

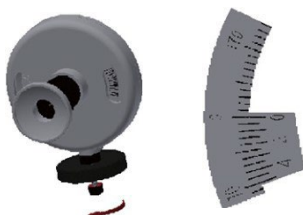
### 7.2 Zero adjustment



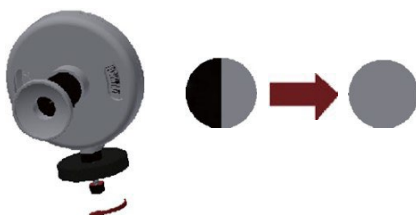
Close the cover, switch on the polarimeter and wait approx. 5 minutes until the measuring device has reached its stabilization time.



Set the vernier scale to  $90^\circ$ .  
Then adjust the focus wheel on the eyepiece so that the field of vision becomes clear (bright circular area).



Set the vernier scale to the  $0^\circ$  position.



The field of vision appears evenly illuminated (slightly dark) .

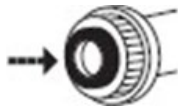
*When turning the vernier wheel around the zero point a central reservation appears and the two Circle halves alternately light and dark (penumbra method).*

### 7.3 Filling the cuvettes

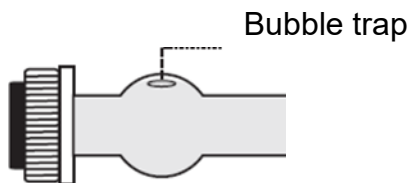
- ⇒ Remove the cuvette lid, the inner cover, the sealing ring and the glass plate.
- ⇒ Clean the cuvette with distilled water.
- ⇒ Fill the cuvette with distilled water.
- ⇒ Carefully tighten the flask lid.



- ⇒ Remove any drops of water from the glass plate.

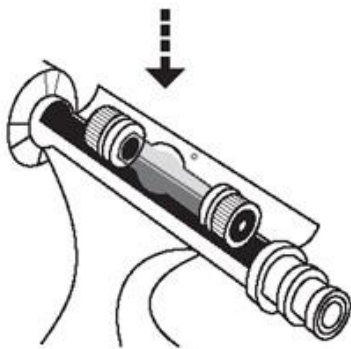


- ⇒ Make sure to collect any air bubbles in the bubble trap provided.

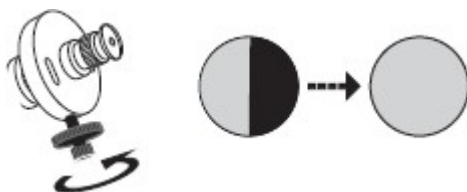


### 7.4 Measurement

- ⇒ Open the cover and place a filled cuvette in the sample chamber (bubble trap at the top).



- ⇒ Close the cover and turn the vernier wheel until a uniform, slightly dark field of view is achieved again.



- ⇒ Read the value using the vernier scale (look through the magnifying glass).  
To determine the exact angle of rotation, calculate the mean value from the left and right scale readings.

**Note:**

If the measured value is positive, it is a dextrorotatory substance.

This means that the plane of polarization of the light is rotated clockwise in the direction of observation.

If the measured value is negative, then the substance is counterclockwise.

**7.5 Calculation of the concentration**

To determine the concentration of the sample, use the following formula:

$$C = \frac{100 \times \alpha}{L \times (\alpha)}$$

C      Concentration (g/100ml)

$\alpha$       Optical rotation

( $\alpha$ )      Specific rotation

L      Length of the cuvette  
(dm)

**Attention!**

The ambient / room temperature and the sample temperature influence the measurement result of the polarimeter. The scales are designed for an ambient temperature of +20 °C! The following applies to most substances: The angle of rotation is reduced by 0.3% for every 1 ° increase in temperature at 589 nm light wavelength.

## **8      Cleaning**

Clean the polarimeter with a soft, lint-free cloth moistened with water or, if necessary, alcohol and do not use any aggressive or abrasive cleaning agents. Never immerse the device in water or hold it in running water. Never touch the appliance with wet or damp hands.

Never touch lenses and glass objects with hard tools made of plastic, wood, rubber, metal, glass or similar. Hard objects can quickly damage the soft material, resulting in measurement errors.

Cleaning should be carried out immediately before and after each use of the polarimeter. This is good for a long service life of the polarimeter and for the most accurate measurement result possible.

## **9      Storage**

Store the polarimeter in a dry, non-corrosive environment, preferably between 10 °C and 30 °C.

## **10 Service**

If, despite studying these operating instructions, you still have questions about commissioning or operation, or if, contrary to expectations, a problem should occur, please contact your specialist dealer. The device may only be opened by trained service technicians authorized by KERN.

## 11 Waste disposal

The packaging is made of environmentally friendly materials that can be disposed of at local recycling centers.

Disposal of the storage box and appliance must be carried out by the operator in accordance with the applicable national or regional law of the place of use.



Old appliances and accessories should not be disposed of with household waste.

The operator must dispose of the packaging and device in accordance with the applicable national or regional laws of the place of use.

The device consists of various components and materials, such as

- Electronic components (circuit boards, electrical cables)
- Plastic (housing)
- Metal (screws)

Improper disposal of the appliance can have harmful effects on people and the environment.

Proper and environmentally friendly disposal can prevent harmful effects and recover raw materials.

## **12 Further information**

Illustrations may differ slightly from the product. We reserve the right to make changes in the interest of technical progress, decoration not included. If possible, do not expose the polarimeter to direct sunlight! Never bring the polarimeter into contact with solvents.