

# User instructions

## Polarimeter

**KERN**

**OAB-L**

OAB 10LN

Version 1.0  
12/2020







# KERN OAB-L

Version 1.0 12/2020

## User instructions Polarimeter

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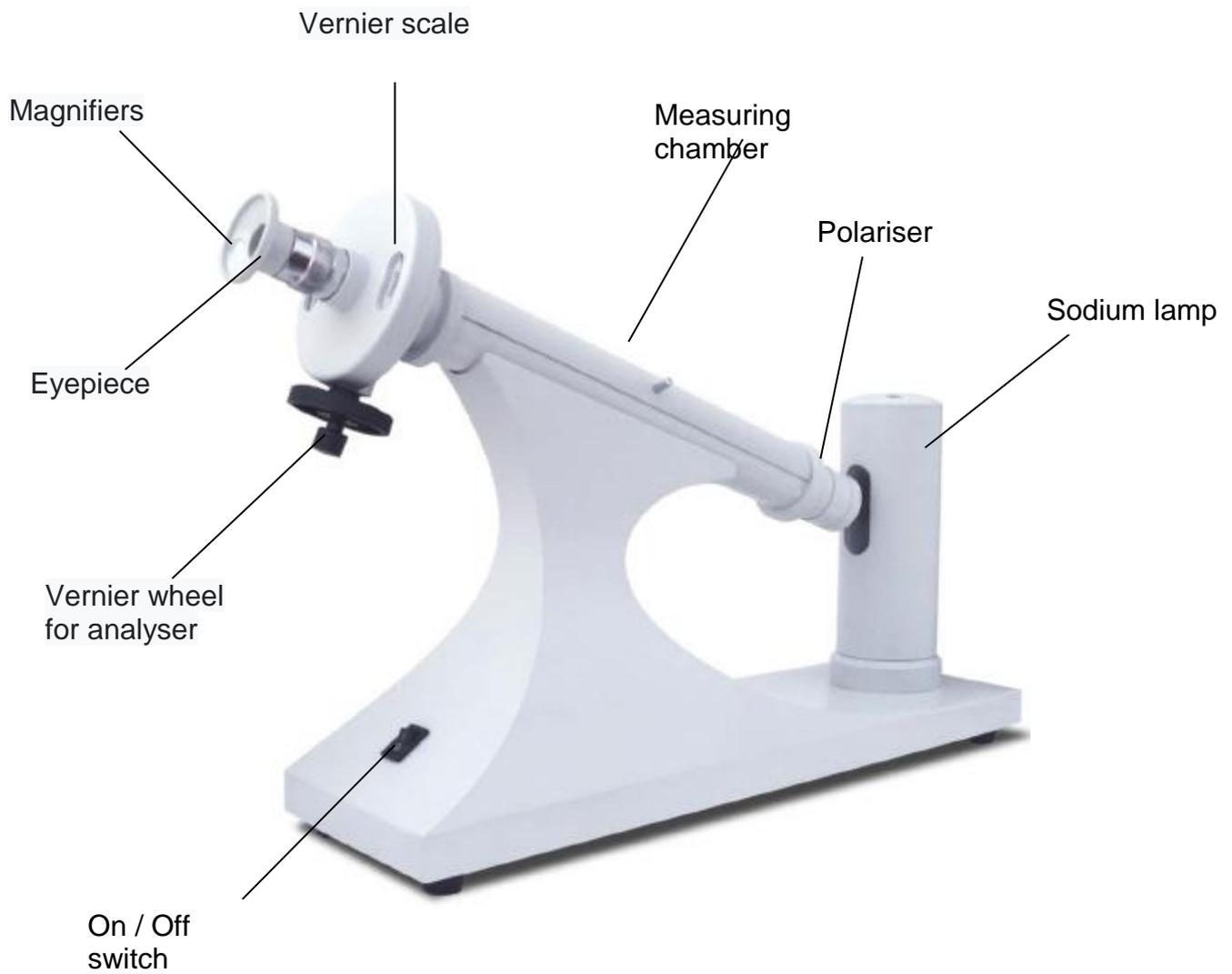
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## 1 Technical data

Model Kern	OAB 10LN
Measuring range	-180° – 180°
Division	1°
Vernier	0,05°
Wavelength	589 nm
Light source	Sodium vapour lamp
Stabilisation time lamp	10 minutes
Magnifiers	3x
Round cells	100 and 200 mm
Power supply	AC 220V / 50Hz
Dimensions	500 x 135 x 330 mm
Net weight	5 kg
Gross weight	6,5 kg

## 2 Nomenclature



## 3 Basic instructions

### 3.1 Intended use

The manual polarimeter OAB-L is used to determine the concentration of optically active substances.

For this purpose, light with a wavelength of 589 nm is linearly polarised by a polariser, passes through the solution to be investigated 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 help of the analyser, the concentration of the solution can now be calculated.

### 3.2 Warranty

The warranty expires in the event of:

Failure to observe the specifications in the operating instructions.

Use outside the applications described.

Modification or opening of the unit.

Mechanical damage and damage caused by media, liquids, natural wear and tear.

## 4 Basic safety instructions

### 4.1 Observe the instructions in the operating manual



Read the operating instructions carefully before commissioning, even if you already have experience with KERN polarimeters.

All language versions include a non-binding translation. The original German document is binding.

## 4.2 Warning

Avoid contact of acid with skin or eyes. Flush burned skin with plenty of water. Take a shower if larger areas are affected.

If the eyes have been burnt, rinse the eyes with lukewarm running water from the outside inwards with the eyelids open. Rinse the eyes for at least 15 minutes. Afterwards, please consult a doctor / ophthalmologist immediately.

Clean the polarimeter thoroughly after each use.

The polarimeter must not be exposed to extreme temperatures, strong mechanical stresses, direct, intense sunlight or high humidity.

This polarimeter is not a toy, it does not belong in children's hands.

Make sure that you do not receive any shocks or similar while using the polarimeter, as this can cause dangerous eye injuries.

Do not touch the lenses with your fingers.

## 5 Scope of delivery

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

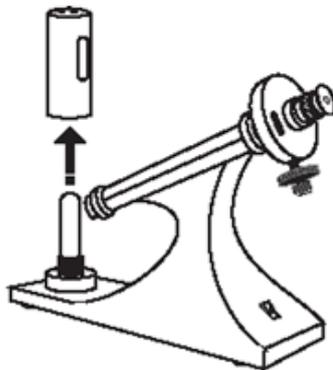
- ⇒ Polarimeter
- ⇒ 2 cuvettes (100mm / 200mm)
- ⇒ Sodium vapour lamp
- ⇒ Replacement sealing rings / lenses for the cuvettes

## 6 Maintenance

### 6.1 Replacing the sodium vapour lamp

Turn off the power supply to the polarimeter before removing the lamp.

1. If necessary, let the unit cool down.
2. Pull off the lamp housing.



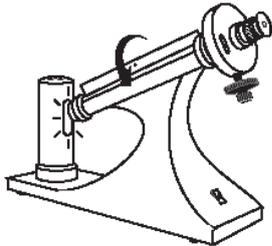
3. Pull the defective lamp out of the socket.
4. Slide a new lamp into the socket.  
Be careful not to touch it with bare hands.
5. Put the lamp housing back in place.  
The viewing window must point in the direction of the polarimeter.

### 6.2 Replacing the fuse

Open the lid on the bottom of the polarimeter by turning it anticlockwise. Remove the fuse and replace it with a new 1.6-amp fuse. Retighten the lid by turning it clockwise.

## 7 Handling / Measurement

### 7.1 Zero Adjustment



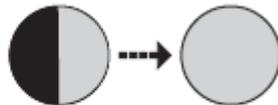
Close the cover, turn on the polarimeter and wait until the sodium vapour lamp has warmed up (approx. 10 minutes).



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



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



The field of view appears evenly illuminated (slightly dark).  
*When the vernier wheel is rotated around the zero point, a centre line appears and the two halves of the circle appear alternately light and dark (penumbra method).*

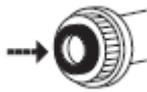
If you notice any deviations, please contact the KERN Service Team.

## 7.2 Filling the cuvettes

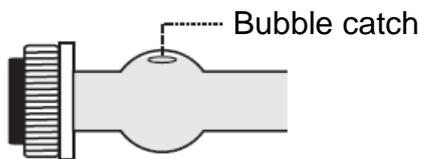
1. Remove the cuvette lid, the inner cover, the sealing ring, and the glass plate.
2. Clean the cuvette with distilled water.
3. Fill the cuvette with distilled water.
4. Carefully tighten the flask lid.



5. Remove any drops of water from the glass plate.

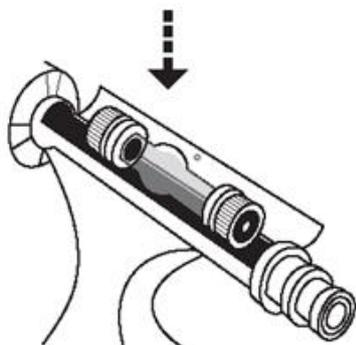


6. Make sure to collect any air bubbles in the bubble trap provided.



### 7.3 Measurement

1. Open the cover and place a filled cuvette in the sample chamber (bubble trap on top).



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



3. 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.

Notice:

If the measured value is positive, it is a dextrorotatory substance. I.e. the plane of polarisation of the light is rotated clockwise in the direction of observation.

If the measured value is negative, then the substance is correspondingly laevorotatory.

#### 7.4 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!**

**For most substances:**

**The angle of rotation reduces by 0.3% per 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 unit 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 relatively soft material, resulting in measurement errors.

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

## **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 unit may only be opened by trained service technicians authorised by KERN.

## **11 Disposal**

The packaging is made of environmentally friendly materials that you can dispose of at local recycling points.

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

## **12 Further information**

Illustrations may differ slightly from the product. Subject to alterations in the interest of technical progress, decoration not included.

If possible, do not expose the polarimeter to direct sunlight!

Never bring polarimeters into contact with solvents.