

APLANATIC  
CONDENSER FOR DIRECT  
AND OBLIQUE LIGHTING  
OH-14

DESCRIPTION AND OPERATION  
INSTRUCTIONS

## 1. DESIGNATION

The Aplanatic Condenser ОИ-14 is designed for direct and oblique lighting of objects in passing light and is used for microscopes type «Биолам» and others which have brackets with fitting sleeve diameter of 37 mm.

Condenser ОИ-14 is installed on the microscope in place of the ordinary condenser.

Condenser ОИ-14 is produced for operation in macroclimate regions with temperate and cold climate in laboratory premises at air temperature from +10 up to +35° C.

## 2. SPECIFICATIONS

Condenser aperture:	
with two lenses . . . . .	1.4
with a lens . . . . .	0.3
Movement range for oblique lighting, mm . . . . .	± 10

Overall dimensions, mm,  
not over . . . . . 115×55×50  
Mass, kg, not over . . . . . 0.27

### 3. COMPLETE SET

Complete set of the condenser is pointed out in its certificate.

### 4. DESIGN AND OPERATION

Condenser OH-14 with aperture of 1.4 consists of front lens 1 (Fig. 1) and lens 2 with

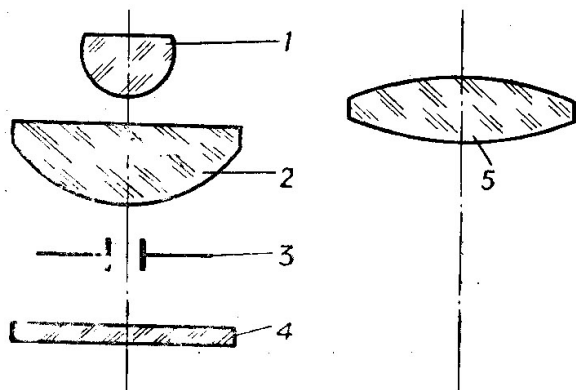


Fig. 1

parabolic surface. Placed on the lower part of the condenser are an iris aperture diaphragm 3 and swinging light filter 4.

Spectacle lens 5 serves for reducing the condenser aperture to 0.3. It is inserted instead of lenses 1 and 2.

The condenser includes two parts: 6 (Fig. 2) and 7. The first part is the optical arrangement of the condenser and the

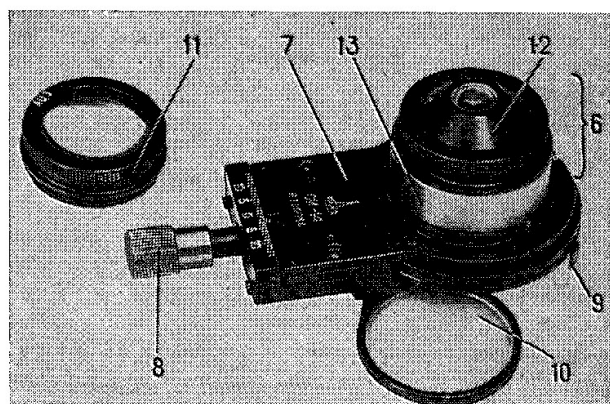


Fig. 2

second, which is a rotary part, is a movable iris aperture diaphragm. Displacement of the iris diaphragm is made by rotating butterfly-nut 8. The index line and the scale are marked on the swinging part of the condenser. There are ten divisions on every side of the scale from the zero. The reading value is 1 mm. When the index line and the zero line of the scale are matched, the diaphragm axis will be matched with the optical axis of the

condenser what is necessary for normal direct illumination. The iris diaphragm is opened and closed by handle 9. On the lower part of the condenser a swinging mount 10 with a receptacle for light filter is fastened.

Spectacle lighting lens 5 (Fig. 1) supplied with the condenser is in mount 11 (Fig. 2). The male thread of mount 11 is the same as one of mount 12, therefore if is necessary mount 11 can be inserted into ring 13 instead of mount 12 and then the condenser aperture will be equal to 0.3. Thus, any of two mounts with the lenses in accordance with the lens used in work can be installed.

## 5. MARKING

Each condenser bears engraving «OI-14», Manufacturer's trade mark, item number the two first digits of which stand for the last two digits of condenser output year.

## 6. METHOD OF WORK

6.1. Condenser OI-14 is inserted into the microscope bracket ring instead of the condenser of any biological microscope.

6.2. It is fixed by a set screw.

6.3. The microscope should be properly set relative to the light source (artificial or natural). The sharp and distinct image of

the object can be obtained only when the object is properly illuminated.

When working in the conditions of the natural light (the daylight), it is better to work at a window which faces the north side, therefore straight sun rays could not get the mirror.

Illuminators OI-19, OI-24, OI-31, OI-32, OI-35 are recommended to be used as an artificial light source. The methodology of adjustment and working of the microscope with the illuminator is given in the description of each illuminator.

6.4. You may observe objects in direct lighting. In this case the index should be matched with zero division of the scale.

When observing the object in oblique lighting the index should be displaced from the zero position.

Watch that the lamp filament is constantly projected onto the centre of the condenser diaphragm and it should fill the diaphragm. In this case the object will be illuminated by the oblique beam of light and the image will be more relief and contrast.

6.5. Adjust the microscope according to the description and operation instructions.

6.6. In order to receive the most contrast image one can rotate the aperture diaphragm round the condenser axis depending on the type of the object.

When operating with high-power objectives (from 20× and greater) use a conden-

ser, the aperture of which is 1.4 and when operating with magnifications from 10× and less, use the condenser with an aperture  $A=0.3$ .

The aperture diaphragm image is received in the exit pupil of the microscope (near to the last objective lens). This image can be seen, if one takes the eyepiece lens out of the microscope tube and looks through the tube at the last objective lens.

6.7. Close the aperture diaphragm to the limit. Then, observing the objective exit pupil, one should open the aperture diaphragm gradually until the diaphragm image covers all the exit pupil aperture. As a rule it is recommended to have such a degree of the opening of the aperture diaphragm, by which the diameter of its image could be equal to  $\frac{2}{3}$  of the diameter of the microscope objective exit pupil. But the final choice of the aperture diaphragm opening depends on the type of the object; the aperture diaphragm should be opened so that the object image could be most contrast. If the aperture diaphragm is too much open, the contrast of the image usually drops.

Condenser lenses are changed easily and simply:

Lower the condenser bracket to the lower stop.

Loosen the set screw.

Remove the condenser from the microscope condenser bracket.

Putting your left hand on the adapter ring 13, remove mount 12, rotating it to the left side with your right hand by knurled part.

Screw the mount 11 into adapter ring 13.

Besides, condenser OИ-14 construction allows to use the iris diaphragm only (without condenser lenses). It is necessary in special works with very small magnifications.

To use the complete aperture of the condenser when operating with immersion objectives, it is recommended to apply a drop of immersion oil to the plane surface of the front lens of condenser with  $A=1.4$  (between the condenser and the stage glass).

## 7. MAINTENANCE, STORAGE, SHIPMENT

### 7.1. Maintenance

On reception of the condenser examine the packing and seal for safety.

The condenser is supplied carefully tested and operates without troubles, provided it is kept clean and prevented from damage.

Special attention should be paid to optics. Lens surfaces are dusted, and fat deposits are removed with a soft cloth or a piece of cotton slightly soaked in pure benzine or xylene.

## 7.2. Storage

When inoperative, the condenser should be removed from the instrument and put into its package.

## 7.3. Shipment

If necessary to move to another premises, the condenser should be put into its package. The condenser should not shift while jolting. All kinds of sheltered shipment possible.