

BRIGHT-AND DARK FIELD
CONDENSER



OH-10



Leningrad
Optical-Mechanical
Enterprises,
Amalgamated

BRIGHT-AND DARK FIELD
CONDENSER

ОИ-10

INSTRUCTIONS FOR USE

I. APPLICATION

The ОИ-10 condenser is used to obtain a bright or dark field in a microscope when illuminating the objects with transmitted light. The condenser is inserted into the substage sleeve instead of the conventional condenser.

II. SPECIFICATION

Condenser aperture for bright field	0.6
Condenser aperture for dark field	0.7
Free distance with microscope used for work in bright or dark field . .	11.25 mm

Overall dimensions . 62 mm×
 ×54 mm×42 mm
 Weight 0.16 kg

III. OPTICAL SYSTEM

The optical system of the condenser

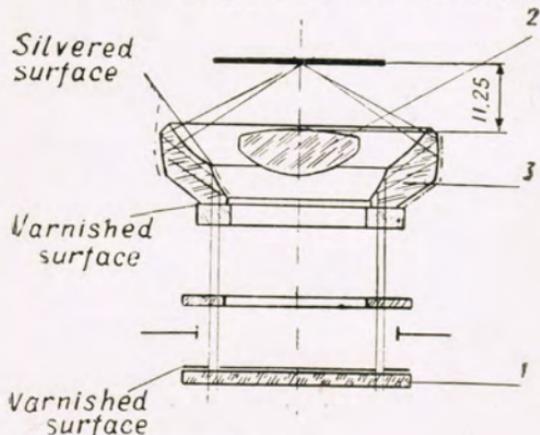


Fig. 1

For bright field work (Fig. 1) is similar to that of a conventional conden-

ser in a biological microscope. When the condenser is used to provide a bright field, annular diaphragm 1 is closed and the rays of light pass directly through lens 2.

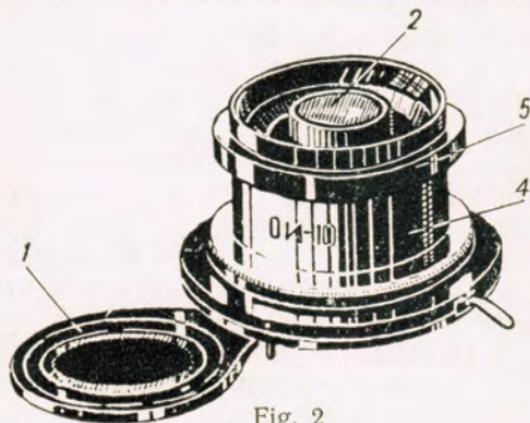
In order to improve the image contrast with respect to the general background of the microscope field of view, use is made of the dark field method for illuminating the objects under study. In this case the parallel beam of light enters the condenser in the form of a hollow shaft limited by annular diaphragm 1, is reflected from the two mirror surfaces of reflector 3 and goes out in a narrow beam shaped as a hollow cone with its apex located in the object plane. The aperture of the dark field condenser is to be greater than that of the objective lens.

On emerging out of the condenser the rays of light will fall beyond the objective lens and therefore the microscope field of view will remain dark when no object is placed there. If an object is present, diffused light is re-

flected from it and falls into the objective, producing in the microscope field of view a bright contrast image of the object against the dark background.

IV. DESIGN

The condenser consists of two split



parts: the lower one includes body 4 (Fig. 2) and swing-out annular dia-

phragm 1 for dark field and the upper one comprises mounting 5 with lens 2 and dark field condenser.

V. OPERATING INSTRUCTIONS

Condenser mounting

The condenser enables ordinary microscopic work and photography as well as dissecting living organisms to be carried out in a bright or dark field and may be used with all objectives of the «dry system» provided their aperture does not exceed that of the condenser.

The objects may be illuminated with daylight or artificial light. The illuminator ОИ-19 is recommended for use as a source of artificial light.

The split parts of the condenser are mounted on different microscopes in different ways.

To mount the condenser on the stand of the conventional biological

microscope МБР-1, proceed as follows:

1. Insert the lower part of the condenser in the substage sleeve instead of the conventional condenser and fix it with the clamping screw.

2. Remove the top disk from the object stage by pushing it out from yourself having turned out the stage centering screws.

3. Insert the upper part of the condenser into the body of the lower part through the open hole in the stage base.

4. Replace the disk in its initial position.

5. By slowly lifting the illumination bracket, bring the condenser in a position providing of the best possible illumination of the object.

6. Center the top disk of the stage by means of the centering screws so that the upper part of the condenser could easily enter the stage hole as its bracket is elevated.

One should remember that the object should be moved only by means of the specimen driver without resort to the centering screws.

The condenser is mounted on the stand of the МБИ-3 biological microscope by separately fitting the two parts of the condenser into the bracket sleeve without removal of the stage top disk. In this case the microscope stage should be centered as well.

Adjustment of Illumination System for Work in Daylight

1. Turn an objective lens 8^{\times} or 10^{\times} into the microscope revolver and insert an eyepiece 7^{\times} or 10^{\times} into the draw tube.

2. Mount the specimen driver with the studied object or with a moistening bath on the microscope stage.

3. Swing the dark field diaphragm out of the path of light beam.

4. Focus the microscope on the object under study.

5. By adjusting the microscope mirror, direct the rays of light from the window into the iris diaphragm of the condenser.

Adjustment of Illumination System for Work with OИ-19 Illuminator

1. Close the condenser iris diaphragm to its minimum size.

2. By adjusting the tilting mirror, bring the image of the illuminator lamp filament into the centre of the iris diaphragm.

3. Adjust the lamp relative to the illuminator collector to obtain a sharp image of the lamp filament in the plane of the iris diaphragm.

4. Close the illuminator iris diaphragm to its minimum size and, by raising or lowering the condenser, obtain a sharp image of the diaphragm in the microscope field of view.

5. Turn the microscope mirror to have the image of the illuminator diaphragm at the centre of the field of view.

6. Open the illuminator diaphragm so large as to bring its edges beyond the limits of the microscope field of view.

7. Adjust the opening of the condenser iris diaphragm to achieve the maximum sharpness of the specimen image.

8. Place the required objective and eyepiece in position.

9. Swing out diaphragm 1 to work in a bright field or insert it in the path of the light beam if the dark field method is used.

When employing the dark field technique, the condenser iris diaphragm should be fully opened. In this case the best contrast of the object image may be obtained by lifting or lowering the condenser to the proper height.

VI. CARE

Upon arrival of the condenser be careful to check that its packing and seal are intact.

The condenser is shipped after having passed thorough inspection. To ensure its unfailing service, the condenser should be kept in cleanliness and saved from damage.

Special attention should be given to the cleanliness of the condenser lenses. Dust should be removed from the optical surfaces with the use of a squirrel-hair brush and grease stains may be cleaned off with soft cloth or cotton wool soaked in clean benzine or xylene. Particular care should be taken in cleaning the mirrors that have outside coatings; dust should be blown off from them with the use of a rubber syringe.

When not in use, the condenser should be removed from the microscope and placed in its sheath.