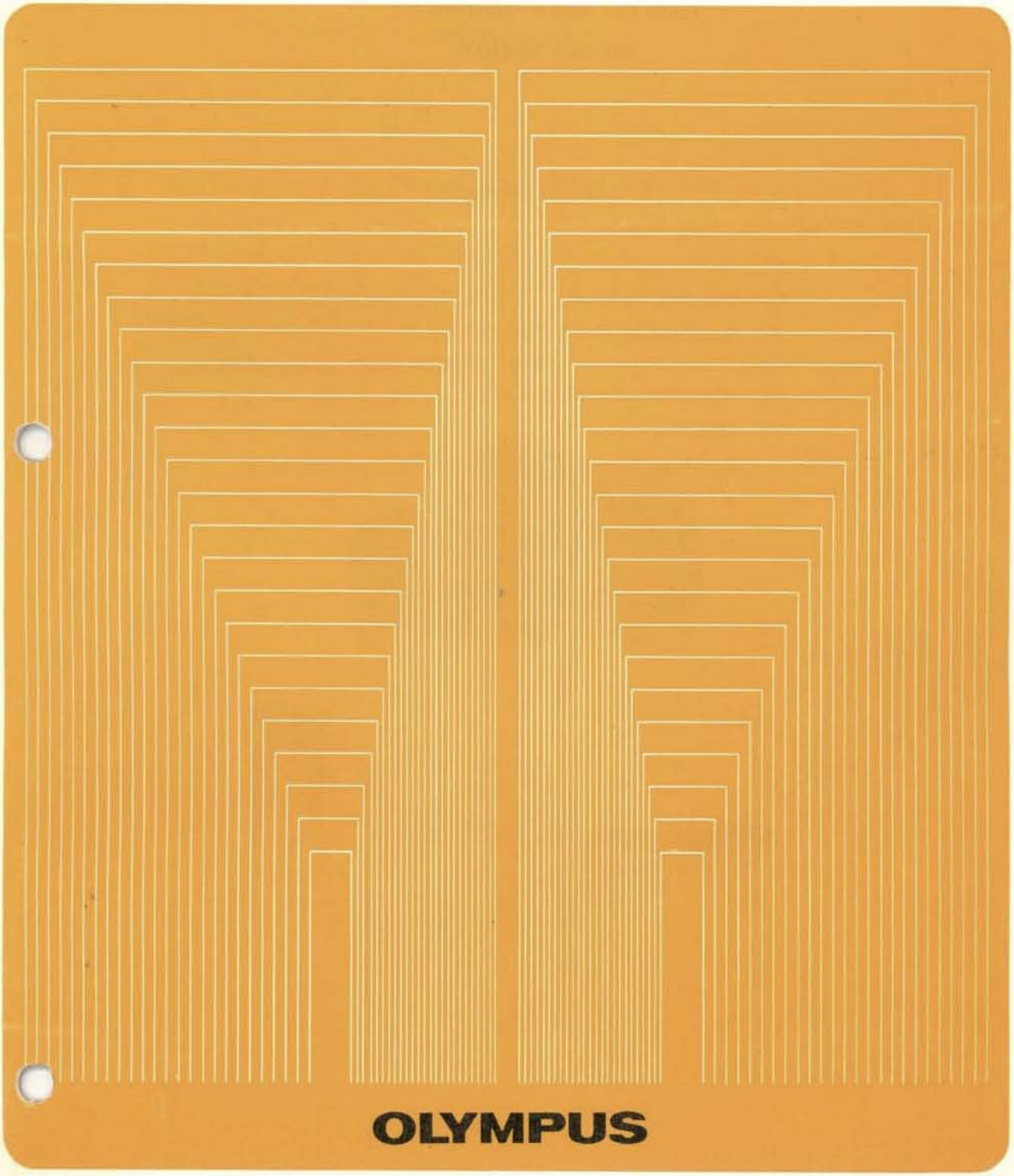
INSTRUCTION MANUAL

PHASE CONTRAST ATTACHMENT

for model VANOX



OLYMPUS

Phase Contrast Attachment for
MODEL VANOX

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II. Specifications of the Phase Contrast Turret Condenser

Achromatic/aplanatic condenser, N.A. 1.40, with built-in light annuli for 10X, 20X, 40X and 100X objectives, turret type, centerable.

Built-in aperture iris diaphragm with aperture scale.

Built-in darkfield aperture stop, N.A. 0.9 – 1.4.

III. Nomenclature of Components

Centering Telescope CT

Auxiliary Clamping Wrench

IV. Operation

A. Phase Contrast Microscopy

1. Summary of Observation Procedure
   1) Attach the phase contrast turret condenser to the microscope substage.
   2) Mount the phase contrast objectives on the nosepiece.
   3) Center the phase contrast turret condenser.
   4) Rotate a phase contrast objective into the light path, and by rotating the phase contrast condenser turret, introduce the light annulus corresponding to the objective in use into the light path.
   5) Rotate the auxiliary lens system to the position corresponding to the objective in use.
   6) Place a specimen on the stage and focus.
   7) Align phase annulus and light annulus.
   8) Observe the phase contrast image.

2. Attaching the Phase Contrast Turret Condenser
   1) Remove the condenser attached to the microscope and slide the turret condenser into the substage mount in the same manner as the standard condenser.
   2) For tightening the condenser clamping screw, fit the auxiliary clamping wrench onto the condenser clamping screw. After tightening, remove the auxiliary clamping wrench. (Fig 1)

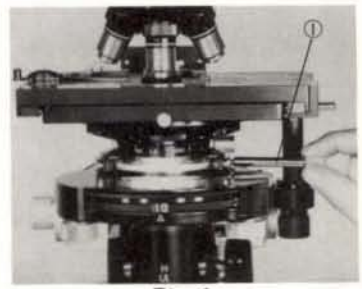


Fig. 1

3. Centering the Phase Contrast Turret Condenser

   Center the phase contrast turret condenser in the same manner as the standard achromatic/aplanatic condenser, i.e., by forming an image of the field iris diaphragm in the field of view of the eyepiece.

   1) Make sure that the frosted glass under the light exit of the microscope base is out of the light path and the swing-out auxiliary lens inside the microscope base is in the light path (the lever in upright position).
   ☆ For phase contrast microscopy, this condition must be maintained at all times.
   2) Rotate the phase contrast turret until the numerical aperture scale can be seen on front side of the condenser and it clicks into the position firmly.
   3) Rotate the aperture iris diaphragm control ring and open the aperture iris diaphragm fully. (scale at 1.4 position)
   4) Place a specimen on the stage, bring the 10X objective on the nosepiece into the light path, rotate the auxiliary lens system to position "L" and bring the specimen in focus.
   5) Stop down the field iris diaphragm with the knurled ring on the auxiliary lens system all the way.
   6) While looking through the eyepieces, move the condenser up and down with the condenser height adjustment to focus on the image of the field iris diaphragm.
   7) While widening the diameter of the field iris diaphragm progressively, manipulate the condenser centering knobs to bring the diaphragm image into the center of the field of view.

When the polygonal image of the iris diaphragm becomes inscribed in the field, slightly increase the diameter of the field iris diaphragm until it is just outside of the field of view.

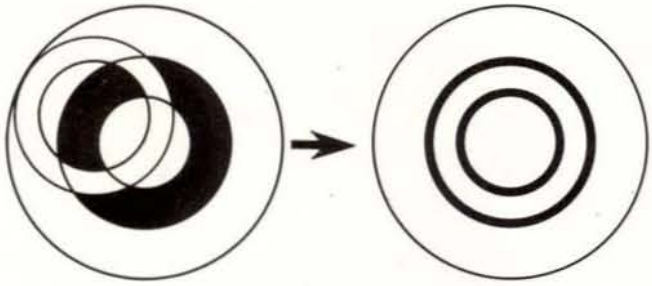
4. Operation of the Auxiliary Lens System

The auxiliary lens system is operated in the same manner as for standard observation with the achromatic/aplanatic condenser.

Objective Magnification	Auxiliary Lens System	Frosted Glass at the Light Exit	Lever Position of Swing-out Auxiliary Lens
10X	L	OUT	IN (lever upright position)
20X			
40X	H, UL		
100X			

5. Aligning Phase Annulus and Light Annulus

1) Swing an objective into the light path.
2) Rotate the phase contrast turret until the number corresponding to the objective magnification is at the front side of the turret. Click-stops for each turret position insure precise, repeatable light annulus alignment. For example, if the 10X objective is used, rotate the phase contrast turret until "10" on the turret points towards the observer.
3) Select the auxiliary lens system position according to the objective magnification in use.
4) Place a specimen on the stage and bring it into approximate focus.
5) Remove the eyepiece, and insert the centering telescope into the eyepiece tube.
6) Rotate the top lens assembly of the centering telescope to bring the bright ring (light annulus) and the dark ring (phase annulus) in focus.
7) While pressing the two releasing tips on the two centering knobs at the bottom of the condenser with your fingers, rotate the centering knobs until condenser annulus and objective annulus are concentrated and superimposed. (Fig 2)
If there is an uneven illumination in the field of view after the alignment, slide the tungsten lamp socket back and forth until even illumination is obtained.
☆ The phase annulus and the light annulus are initially aligned with the 10X objective. The remaining annuli are then automatically centered, with, perhaps, an occasional touch up.
8) Remove the centering telescope, and insert the eyepiece back into the eyepiece tube.



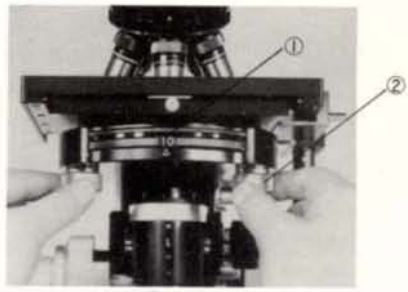


Fig. 2

B. Brightfield Microscopy

The combination of the phase contrast turret condenser and the auxiliary lens system permits normal brightfield microscopy.

Observation Procedure:

1. Rotate the phase contrast turret until the numerical aperture scale can be seen in front side of the condenser and it clicks into the position.
2. Center the aperture iris diaphragm in the auxiliary lens system.
   1) Bring the 10X objective into the light path.
   2) Replace the eyepiece with the centering telescope.
   3) Stop down the aperture iris diaphragm with the aperture iris diaphragm control ring, then the image of the aperture iris diaphragm will be seen in the field of view of the centering telescope.
   4) Rotate the top lens assembly of the centering telescope to bring the image of the aperture iris diaphragm in focus.
   5) Open the aperture iris diaphragm progressively and manipulate the centering knobs at the bottom of the condenser until the image of the aperture iris diaphragm touches evenly the edge of the field of the centering telescope.
   6) Replace the centering telescope with the eyepiece.

The rest will be the same to the procedure of normal brightfield microscopy.

C. Darkfield Microscopy

The phase contrast turret condenser also permits darkfield microscopy as per the following procedure.

1. Rotate the phase contrast turret until "D" is clicked into the position at the front side of the condenser.
2. Set the auxiliary lens system of the microscope to position "H", "UL".
3. Bring a specimen in focus and adjust with the centering knobs on the condenser until the field of view obtains even illumination.
4. Objectives 10X, 20X and 40X may be used in this method. However, in the case of the 10X objective, the edge area of the field of view may not be illuminated sufficiently.

Besides the standard PC PL phase contrast objectives, this attachment is optionally provided with 3 other contrasts – PLL, NH and NM.
These letters of the contrasts designate as follows:

N, Negative; P, Positive; H, High; M, Medium; LL, Low-Low.

Therefore you may select and purchase any of them according to your requirements.

Letter	Contrast	Purpose
P	Positive	Observation of the internal structure of cells or nuclei.
N	Negative	Observation of shapes or appearances, such as figures and movements of an object.
H	High	When the specimen contrast is relatively small.
L	Low	When the specimen contrast is relatively large.

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