Olympus microscope

INSTRUCTIONS

KHC

Olympus TOKYO

MODEL KHC INSTRUCTIONS

Contents

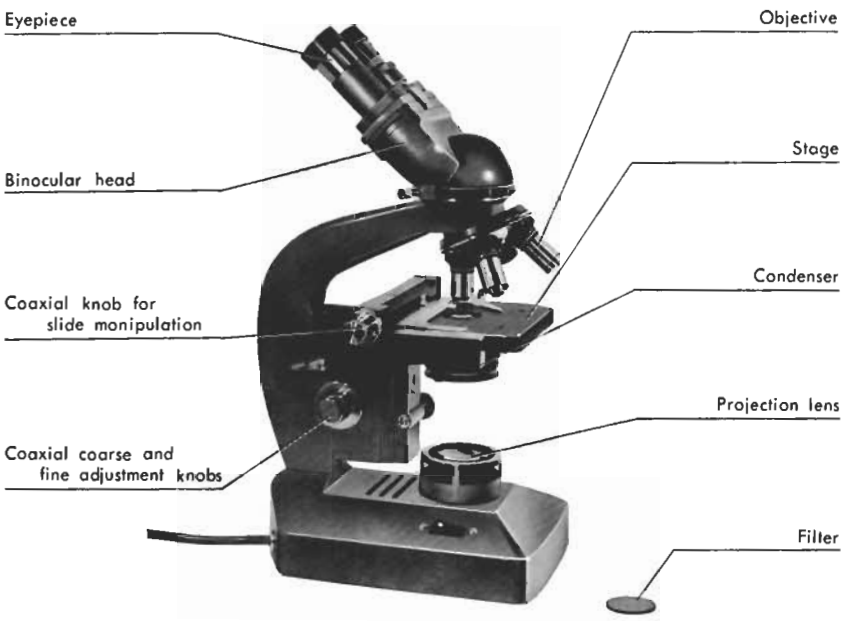
Ⅰ. Standard Set

Main Body : (built-in light source, stage and revolving nosepiece)	1 set
Binocular Head	1 set
Objectives : 4x, 10x, 40x, 100x,	1 ea.
Eyepiece : Bi WF10x	1 pr.
Condenser	1 pc.
Filter	1 pc.
Spare Lamps : 20W	3 pcs.
Eyepiece tube cap	2 pce.
Dustproof Cap (for projection lens)	1 pc.
Cargille Oil	1 btl.
Vinyl cover	1 pc.
Certificate of Inspection	1 copy

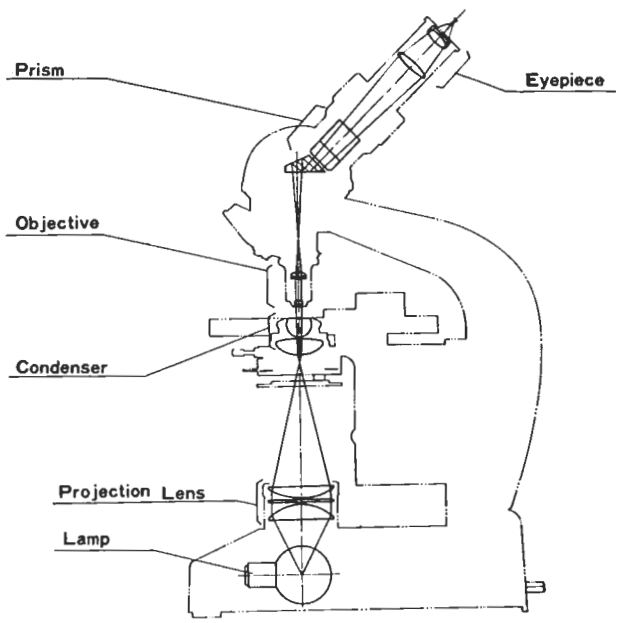
Ⅱ. Specifications

Head : Binocular Head	45° inclination, rotatable through 360° horizontally;	
	Stopper to fix the head at any designed position.	
	Range of interpupillary distance adjustment : 55.5 - 74mm.	
	Dioptric adjustment is possible.	
Revolving nosepiece :	Quadruple indicator for Objectives' position	
Focusing :	Vertical movement stage	
Coarse abjustmemt :	Range of operation 28mm	
Fine adjustment :	Range of operation 2mm	
Condenser :	N. A. 1.25	
	Variable iris-diaphragm	
	Range of vertical movement 15mm	
Illumination :	Pre-centered 20W light source is built inside the base.	
Stage :	Coaxial single-handle square mechanical stage	
	Range of operation : Back-forth 30mm	
		Right-left 70mm
Dimensions :	Height	355mm
	Width	165mm
	Depth	205mm
	Net weight	approx. 5.5kg without case

Ⅲ. Name of Parts

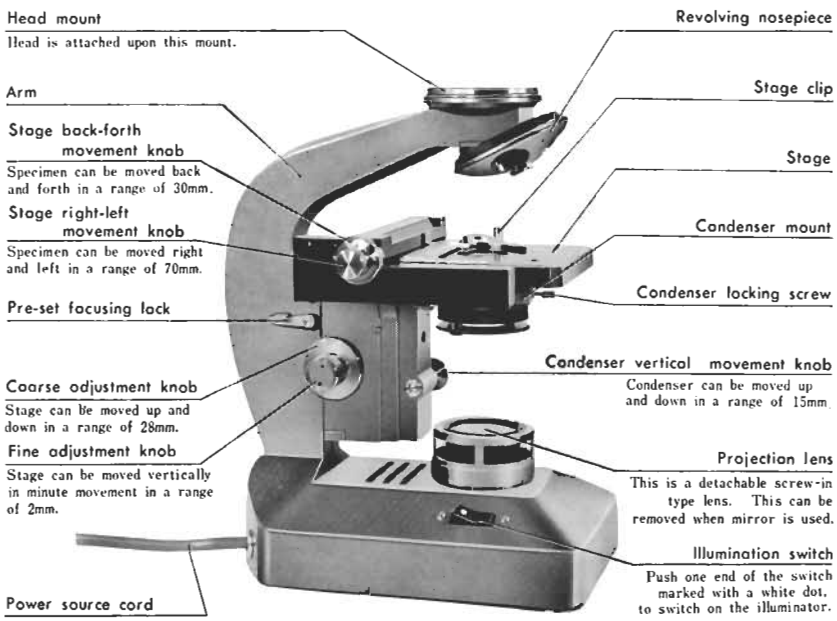


Ⅳ. Optical Path



V. Structure and Assembly

A. Main Body



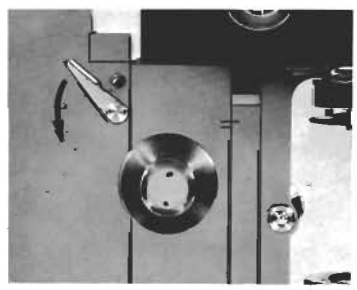
1. Revolving Nosepiece

The quadruple nosepiece moves very lightly and click-stops in the right position for the optical path.

Mount the objectives in such an order that, when the nosepiece is turned clockwise during observation, an objective of the next higher magnification will come into position.

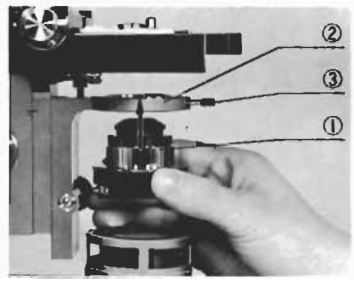
2. Pre-set focus lock

When the lock is tightened, it will hinder the movement of the stage further upward from that point. When the stage is moved down once and again brought up closer to the lens, it will stop at the position set by the lock. This will help prevent the speciment to crash against the objective and further facilitates an easy focusing for the observer.

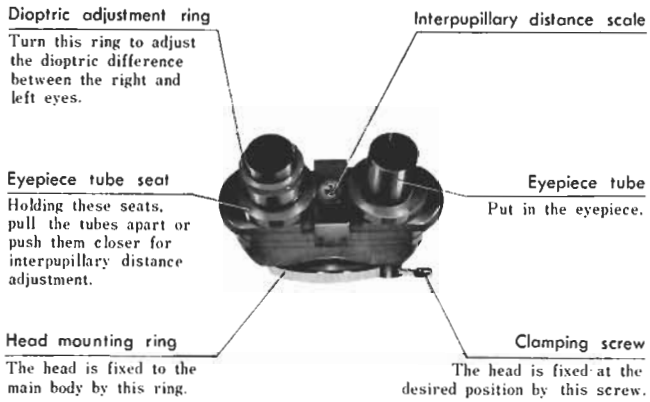


3. Condenser

Insert the condenser ① from underneath into the condenser ② and secure it in position by tightening the locking screw ③.



B. Binocular Head



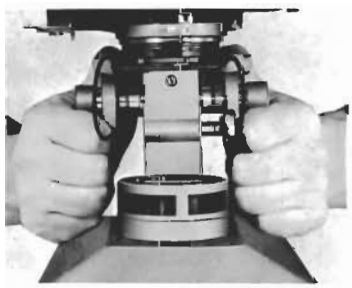
○ How to Mount the Head

Place the head on the receptacle at the upper end of the arm and turn the mounting ring te fix it.

Ⅵ. Method of Operation

A. Smoothening of Coarse Abjustment Knob

This coarse adjustment knob operates rather heavily However, such can be adjusted to the operator's preference. Hold both knobs firmly, turn them counterclo kwise (as shown in the illustration) to make it operate lightly, and clockwise heavily.



B. Light Source

Connect the cord (from the base) with the power source. Press the switch on the white-dotted side to turn on the lamp.

C. Focusing

1. Turn the fine adjustment knob to bring the index line to the middle of the two lines (movement range).
2. Place the specimen on tne stage and secure it with the clips.
3. Put the 10X objective in position.
4. Looking from side of the microscope, move the stage upward carefully by the coarse adjustment knob until the specimen is brought very close to the tip of objective. (** Be most careful not to hit the objective.)
5. Looking through the eyepiece, gradually lower the stage to obtain rough focus.
6. Turn the nosepiece to set the desired objective in position. Accrately focus with the fine adjustment knob.
7. The specimen may be moved by the slide manipulation knob, built on the stage so that the particular spot to be observed comes into the center of the view field.

**** For convenience in the later operations, tighten up the pre-set focus lock when the specimen is roughly in focus at step 5, above. (See for V-A-2, Pre-set focus lock)

D. Inter-pupillary Distance and Dioptor Adjustments

1. The interpupillary distance is adjusted by
   a. Holding both eyepiece tube seats,
   b. Looking into the eyepieces, and
   c. Pulling apart or pushing closer the seats until the view field is observed in one.

   When the adjustment is made, read the figure on the scale ; this will make the adjustment easier from the next time on, as it can be done by merely setting the tubes at the given figure.
2. Diopter is adjusted by
   a. Looking through the right eyepiece with the right eye,
   b. Focusing on the specimen by the coarse and fine adjustment knobs,
   c. Then looking into the left eyepiece with the left eye, and
   d. Turning the diopter ring until the specimen is brought into focus correctly.

   When looking into the left eyepiece with the left eye, do not touch the coarse or fine adjustment knob.

E. Use of Oil Immersion Objective

First, bring the specimen into focus with a low magnification objective (10X). Apply a drop of cargille oil on the specimen as well as at the tip of the oil immersion objective. Turn the nosepiece to bring the oil immersion objective above the specimen. This can be done without the fear of crashing them into each other. Focus accurately with the fine adjustment knob and make observations. Upon completion of observations, carefully wipe off cargille oil on the oil immersion objective with a piece of gauze moistened with xylol.

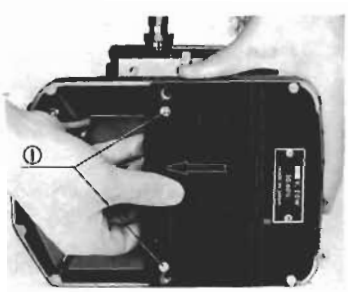
**** Cargille oil left on the objective can ruin the lens greatly. An utmost care is required in this point.

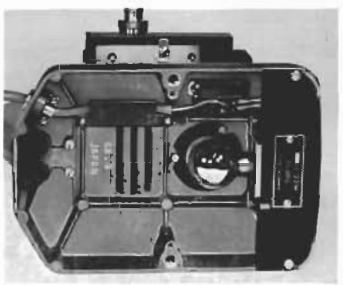
F. Use of Condenser

If an objective of low magnification (less than 10X) is in use, lower the condenser slightly to avoid an uneven illumination as well as for a better result. The upper-lens of the condenser may be removed. Removal of the upper-lens gives a better result than lowering of the condenser. When the oil-immersion objective is in use, move it up to the top of its movement range.

G. Change of Bulb

Lay down the microscope, and loosen two screws ① underside the base with a coin or something like that. Remove the cover and change the used lamp with a new one.





Ⅶ. Optical Characteristics

Objective / Eyepiece					
	Magnification	4x	10x	40x	100x
	Numerical aperture (N. A.)	0.1	0.25	0.65	1.3
	Working distance (W. D.)	19.77	5.1	0.4	0.11
	Focal length	29.2	15.7	4.3	1.8
WF 10x (Number of viewfield 18)	Total magnification	40x	100x	400x	1,000x
	Depth of focus	112.5	18.0	2.0	0.6
	Actual viewfield	4.5	1.8	0.45	0.18

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● OLYMPUS OBJECTIVE HAS ITS COLOUR BAND

THE OLYMPUS OBJECTIVE, you just purchased, has **a colour band** on it. This new step has been adopted for your convenience, that **you may understand the magnification, if you only see the colour,** without looking at the magnification number engraved on the tube. Though there is no mention about the colour band in the instruction booklet, upon your recognition of our new colour system, the olympus products wait for your further efficient usage.

色 Colour		生物用 Biological use			金属用 Metallurgical use		倍率範囲 Range of magnification
		Plan	Fl	Ach	Plan	Ach	
紫	Purple	1.3×			1.3×		0 ～Less than 2×
茶	Brown	2×			2×		2×～Less than 4×
赤	Red	4×		4×	5×	5× 6×	4×～Less than 7×
橙	Orange	10×		10×	10×	10×	7×～Less than 20×
黄	Yellow	20×		20×	20×	20×	20×～Less than 40×
黄緑	Brilliant green	40×	40×	40×	40×	40×	40×～Less than 60×
青緑	Cobalt blue			60×			60×～Less than100×
淡青	Light blue	100×	100×	100×	100×	100×	100×. and over

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Ⅷ. Major troubles with microscope, their possible causes and applicable steps to be taken.

Troubles	Possible causes	Steps to be taken
Slipping down of the stage by itself	Loosened coarse adjustment knob	See Smoothening of Coarse Adjustment knob and properly adjust it.
Coarse Adjustment knob too heavy	1. Axis of Coarse Adjustment knob overly tightened 2. Hardened grease on the sliding surface.	1. Take reverse steps of the above. 2. Notify the manufacturer.
Fine Adjustment knob too heavy	Hardened grease on the sliding surface	Notify the manufacturer.
Dust/Dirt on objective	1. Eyepiece tubes are left without eyepieces or cap. 2. Fingerprints left on the lens; Lens hitting the specimen; or cargille oil left on the oil-Immersion lens.	Wipe off the top lens of the objective with clean gauze; do not touch inner lenses but notify the manufacturer
Dust/Dirt on eyepiece	1. Careless storage. 2. Fingerprints left on the lens surfece	1. Be sure to store the eyepieces after use in the provided container or in a desiccator 2. Wipe off with clean gauze. Do not try to disassemble the eyepiece. Any change in arrangement of lenses can deteriorate the entire opical efficiency.
Scratches on the lens	Lens was wiped with a piece of cloth or leather while dust or filth is still left on.	Immediately notify the manufacturer. The lens will be replaced at the actual cost.

IX. Important points to remember

Dampness and dust is a taboo for the microscope. But, frequently, a lab where the microscope is used is not free of such. It is the best to store microscope after each use in the provided container. If frequent observations make it impossible, at least cover the instrument with the provided vinyl cover.

The objectives and eyepieces should best be stored in a desiccator. Also recommended is to place a pack of silicagel in the container. After the eyepiece is removed from the instrument, be sure to cover the eyepiece tube with the provided cap. Never attempt to disassemble or repair the mechanical parts of the microscope. It must be done by specialists. Cleaning must be performed with utmost care. For expample, dust off with a soft brush or blow off by a rubber ball where hands cannot reach.

Mirror (optional accessory)

In general, microscopy with KHC is conducted with the projection lens on. However, for special illumination effect this mirror can be used for high magnification lens. and the other side, concave surface, is good for observation with low magnification objectives.

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