

Nikon

INVERTED MICROSCOPE

TMS

INSTRUCTIONS

NIPPON KOGAKU K.K.

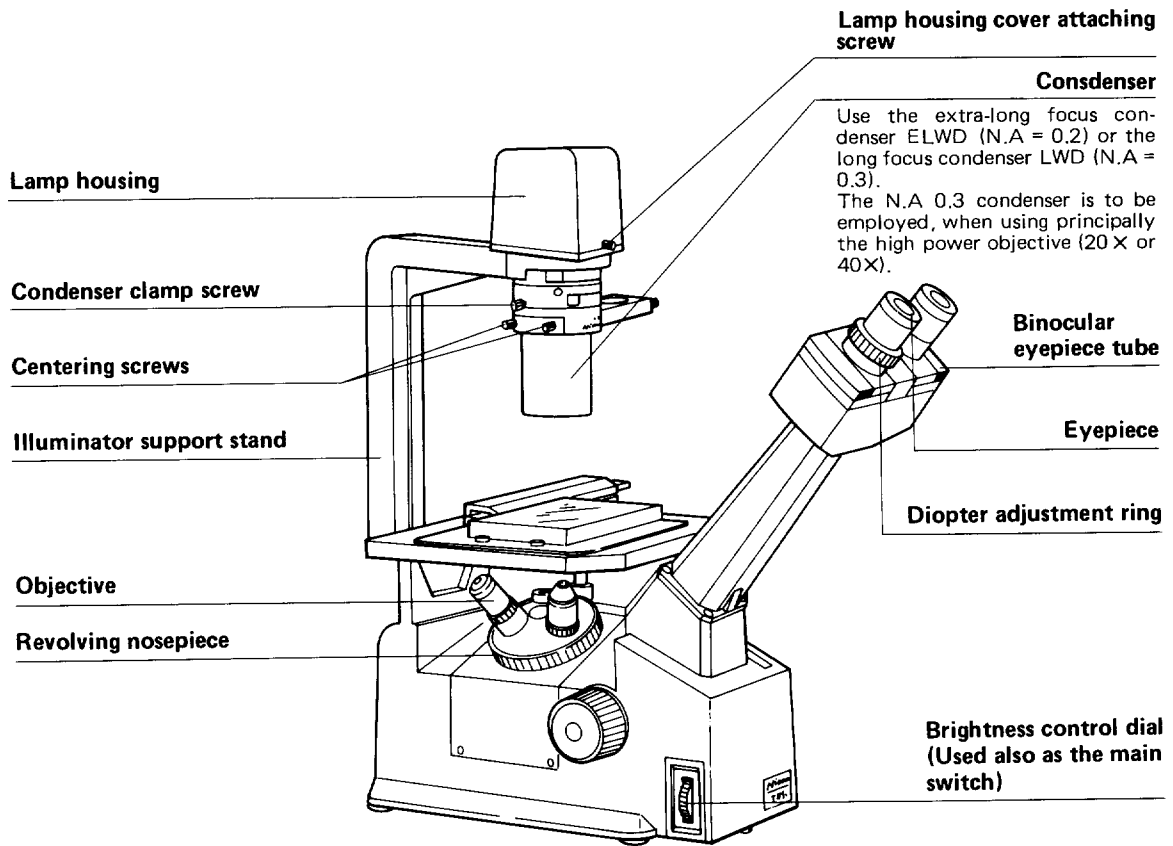


Fig. 2

< Caution >

Attach each objective into the screw hole which is not in the optical path, to prevent dust from entering the microscope tube, and put the cap onto the screw hole which does not accept the objective.

< Caution >

To attach the halogen lamp (6V-20W) to the socket, holding the lamp with the hand and glove or piece of cloth, insert it at right angles securely into the socket.

PRECAUTIONS

- 1 Careful handling**

Handle the instrument gently, taking care to avoid sharp knocks.
- 2 Carrying the instrument**

When carrying the microscope, do not hold it by the illuminator support stand, but by the microscope base and observation square tube.
- 3 Place for using**

Avoid the use in a place, dusty, humid, subject to vibration, or exposed to high temperature or direct sunlight.
- 4 In lighting the lamp**

The lamp housing will be partially heated while being lighted. Take care not to touch the lamp housing being lighted, and never bring any inflammable substance such as gasoline, thinner, or alcohol near to the lamp housing.
- 5 Replacement of the halogen lamp or the fuse**

Before replacing the lamp or the fuse, set the brightness control dial to OFF, and disconnect the power source cord. When handling the halogen lamp (6V—20W), do not touch its glass part with the bare hand.
- 6 Dirt on the lens**

Be careful not to leave dust, dirt or finger marks on the lens surfaces. They likely impair the image quality.
- 7 Focus knobs**

Tightness of the focus knobs having been properly adjusted by the manufacturer, it should not be readjusted by turning the one while holding the other, because of causing disorder.

CARE AND MAINTENANCE

- 1 Cleaning the lenses**

Use a soft hair brush free from dust, or rub lightly the lens surfaces with gauze. Only for removing finger marks or grease, use a soft cotton cloth, lens tissue or gauze, lightly moistened with absolute alcohol (ethanol or methanol). For cleaning the objectives, use only benzine.
- 2 Cleaning the painted surface**

Avoid the use of any organic solvent such as thinner, alcohol, ether, or the like, for cleaning the painted surfaces and plastic parts.
- 3 Avoid dismantling**

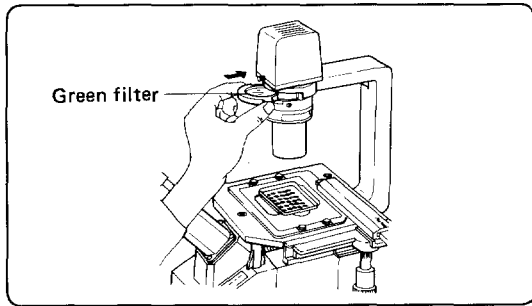
Never attempt to dismantle the instrument so as to avoid the possibility of impairing the operational efficiency and accuracy.
- 4 When not in use**

When not using the instrument, cover it with the vinyl cover, and store the instrument in a place free from moisture and fungus. Especially, it is recommended to keep the objectives and eyepieces in an air tight container with desiccant (desiccator).
- 5 Periodical inspection**

To ensure the high performance and efficiency of the instrument as long as possible, we recommend to let our qualified service engineer inspect and adjust the instrument periodically. Contact our sales agent.

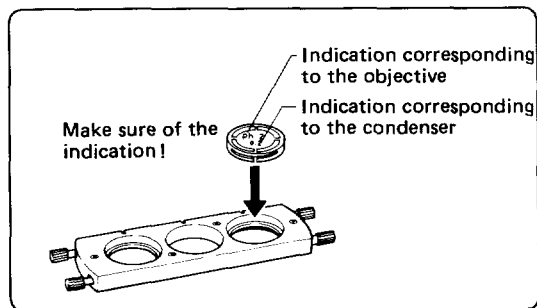
★ Procedure of phase contrast observation

- 1 Insert the green filter into the filter receptacle.

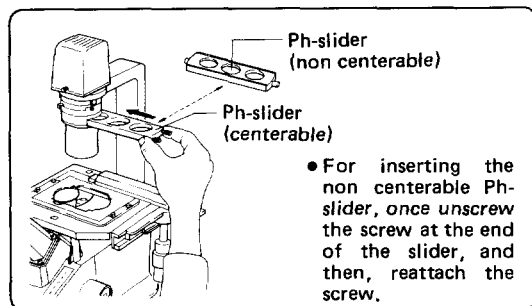


- 2 Fully open the aperture diaphragm.

- 3 Onto the Ph-slider, place the annular diaphragm with the marking on the objective (Ph 1 ~ Ph 3) and the condenser (N.A. 0.2 or N.A. 0.3), to be used.



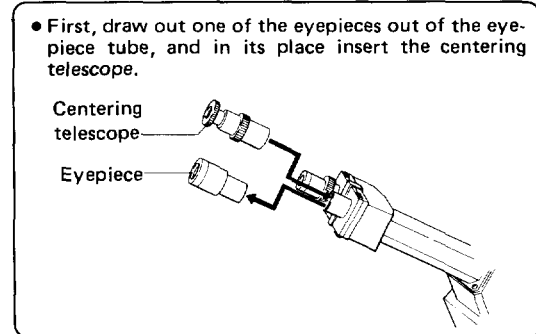
- 4 Attach the Ph-slider to the condenser.



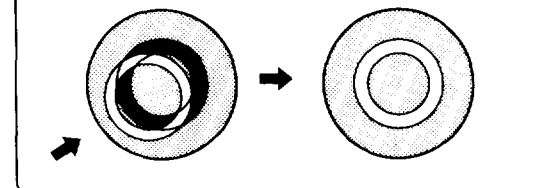
- 5 Bring the annular diaphragm on the Ph-slider into the optical path. At this time, make certain that the indications on the diaphragm correspond to those on the objective and the condenser to be used, respectively.

- 6 Place the specimen onto the stage, and perform focusing.

- 7 When using the centerable Ph-slider, carry out the ring coincidence as below:



- 8 Rotate the eyepiece of the centering telescope, bring the image of the phase plate ring in the objective into sharp focus. If the image of the annular diaphragm, which is also visible in the telescope, is not found overlapped exactly by that of the phase plate ring, make coincidence adjustment, manipulating the two centering screws to move the annular diaphragm.



Note: The above ring coincidence is not necessary, when using the non-centerable Ph-slider.

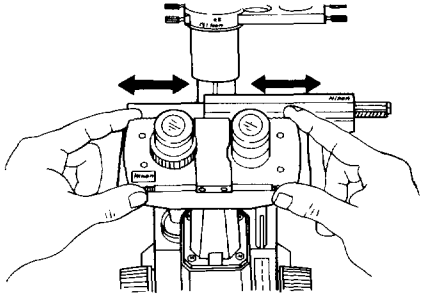
- 8 Replace the centering telescope by the eyepiece.

< Caution! >

- The ring coincidence, once accomplished, may be deranged in such a case as where the observed position is near the circumference of the specimen container. In this case, use the centerable Ph-slider.

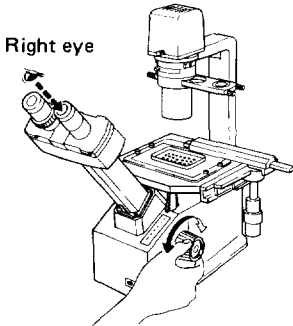
★ Interpupillary distance adjustment

Make the adjustment of interpupillary distance, so that the right and left viewfields become one.



★ Diopter adjustment

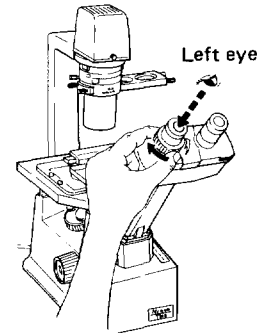
Right eye



Looking into the righthand eyepiece with the right eye, rotate the focus knob to bring the specimen image into focus.

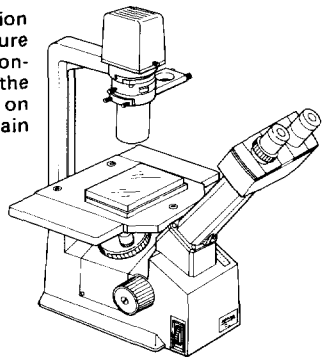


Looking into the left-hand eyepiece with the left eye, turn the diopter ring to bring the specimen image into focus.



★ Auxiliary stage

In the observation with a large culture bottle, it will be convenient to attach the auxiliary stage on both sides of the plain stage proper.



★TROUBLE SHOOTING TABLE

Although nowhere the user can find any disorder or derangement in the instrument, if he encounters some imperfection or dissatisfaction, re-check the use, referring to the table below :

1. Optical

Defects	Causes	Actions
Darkness at the periphery or uneven brightness of the viewfield	<ul style="list-style-type: none"> Revolving nosepiece not settled in click position (Objective not exactly set in the optical path) Lamp not securely set into the socket Dirt or dust on the lens surface (of condenser, objective, eyepiece) Specimen holder on the stage projects into the optical path Ph-slider not completely inserted Filter not correctly inserted 	<ul style="list-style-type: none"> Revolve it into click position Insert it securely into the socket Cleaning Move the specimen Fully insert the slider Insert it correctly
Dirt or dust appears in the viewfield	<ul style="list-style-type: none"> Dust or dirt on the lens surface (of condenser, objective, eyepiece) Dirty specimen 	<ul style="list-style-type: none"> Cleaning Cleaning
No clear image, no sufficient contrast, no phase-contrast effect no high resolution of image attained	<ul style="list-style-type: none"> Annular diaphragm not inserted into the optical path Sizes of annular diaphragm and phase plate ring in the objective not in coincidence with each other Insufficient overlap of annular diaphragm and phase plate ring Dirt or dust on the lens surface (of condenser, objective, eyepiece) Too much closed aperture diaphragm Too thick culture container 	<ul style="list-style-type: none"> Insert it into the optical path Use the diaphragm matching with the condenser and objective being used Adjustment for exact overlap Cleaning Open properly the aperture diaphragm Use the one about 1.2mm thick

2. Manipulation

Defects	Causes	Actions
No focused image obtained even by raising the objective to the higher limit	<ul style="list-style-type: none"> Specimen surface too far separated from the stage surface 	<ul style="list-style-type: none"> Use a container such as of thickness within 6mm from the stage surface
No focused image obtained with 20 X or 40 X objective	<ul style="list-style-type: none"> Too thick culture container 	<ul style="list-style-type: none"> Use a container not thicker than 2mm
Binocular viewfields not united into one	<ul style="list-style-type: none"> Interpupillary distance not correctly adjusted 	<ul style="list-style-type: none"> Adjustment
Eye-strain in observation	<ul style="list-style-type: none"> No diopter adjustment carried out Brightness not properly adjusted 	<ul style="list-style-type: none"> Adjustment Adjustment by changing voltage

3. Electrical

Defects	Causes	Actions
Lamp does not light even though switched ON	<ul style="list-style-type: none"> No electricity supplied Lamp not yet attached Lamp has blown Fuse has blown Intermediate lamp cord disconnected 	<ul style="list-style-type: none"> Connect the power source cord to the socket Attach the lamp Replacement Replacement Insert the cord into the socket on the rear side
Unstable brightness	<ul style="list-style-type: none"> Too much fluctuation of house current voltage 	<ul style="list-style-type: none"> Using an slide AC transformer or the like, adjust the voltage
Lamp promptly blows	<ul style="list-style-type: none"> Too high voltage of house current 	<ul style="list-style-type: none"> Adjust the voltage in the same way as above
Insufficient brightness	<ul style="list-style-type: none"> Specified type lamp not used Too low voltage 	<ul style="list-style-type: none"> Use 6V – 20W halogen lamp Raise the voltage
Fuse promptly blows	<ul style="list-style-type: none"> Specified fuse not used 	<ul style="list-style-type: none"> Use 1A fuse
Flickering or unstable brightness of lamp	<ul style="list-style-type: none"> Lamp going to blow Not secure connection of the connector, etc. Fuse holder cap not fastened firmly Irregular change of house current voltage Lamp not securely inserted into the socket 	<ul style="list-style-type: none"> Replacement Secure the connection Fasten it tightly Use a stabilizer Insert it fully

FUNCTION OF EACH PART

Aperture diaphragm lever

In the brightfield observation, by closing the aperture diaphragm, some details in almost transparent specimen may come in sight, although somewhat lowering of image resolution will result. In the phase-contrast observation, fully open the aperture diaphragm.

Filter receptacle (for 33mm dia. filter)

For the brightfield observation, use a blue or green, and for the phase-contrast observation, use a green filter.

Annular diaphragm

Ph-slider

Two types of the Ph-slider are available, one with the centering device and the other with no centering device. The central hole is used for the brightfield observation.

Stage

A microplate is mountable on the stage without more ado. For observing a specimen in the 60mm Petri-dish, Terasaki plate or on the glass slide, use the specified specimen holder, respectively.

Mechanical stage

Attach the mechanical stage at the right, under side of the stage proper by means of the two screws.

Stage Y-axis travel knob

Stage X-axis travel knob

Lamp brightness indicator

Lighted by turning on the brightness control dial. If the lamp is lighted with the indicator set to the red-colored scale lines over 6V, the life of the lamp will be shortened accordingly.

Focus knobs

Tightness of the focus knobs having been properly adjusted by the manufacturer, do not readjust it by turning the one knob while holding the other.

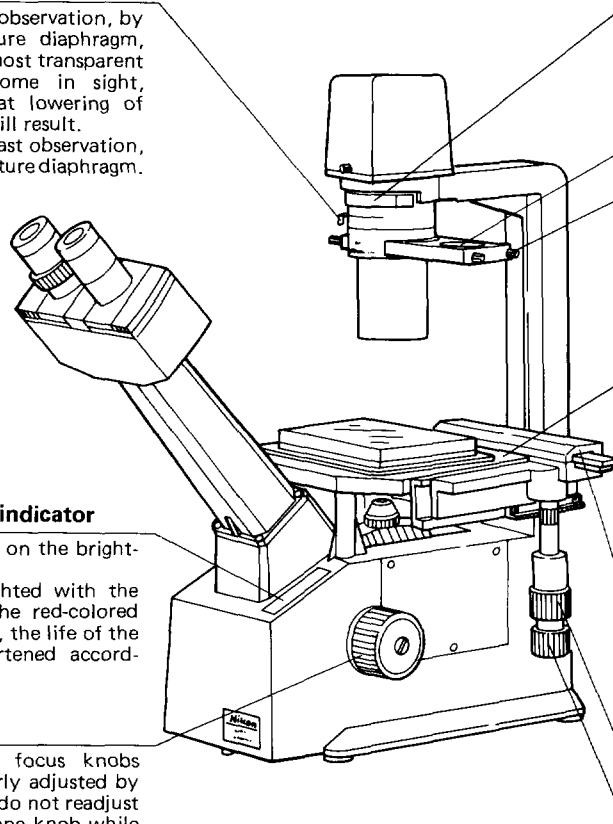
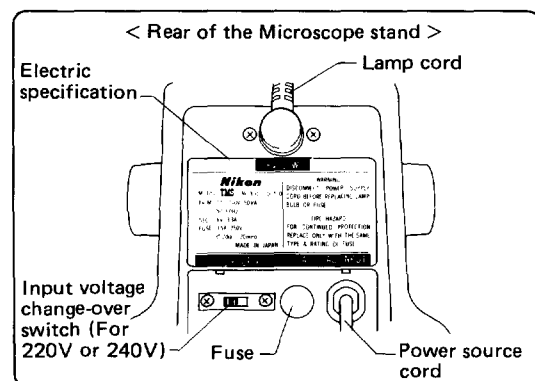


Fig. 1

CAUTION

— For European Districts Only —
Make sure of the input voltage, 220V or 240V, by means of the input voltage change-over switch on the rear of the microscope stand.

— For 120V Districts —
Microscope stand for 120V districts is equipped with the circuit breaker in place of the input voltage change-over switch.



Electric Specification

- Power source: 100, 120, 220/240V, 50/60Hz
- Lamp bulb: 6V-20W Halogen lamp
- Fuse: 1A/250V or 0.5A/250V



NIPPON KOGAKU K.K.

Fuji Bldg., 2-3, 3 chome, Marunouchi,
Chiyoda-ku, Tokyo 100, Japan

☎ 03-214-5311

Telex: J22601 (NIKON)