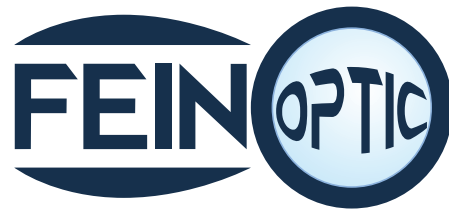
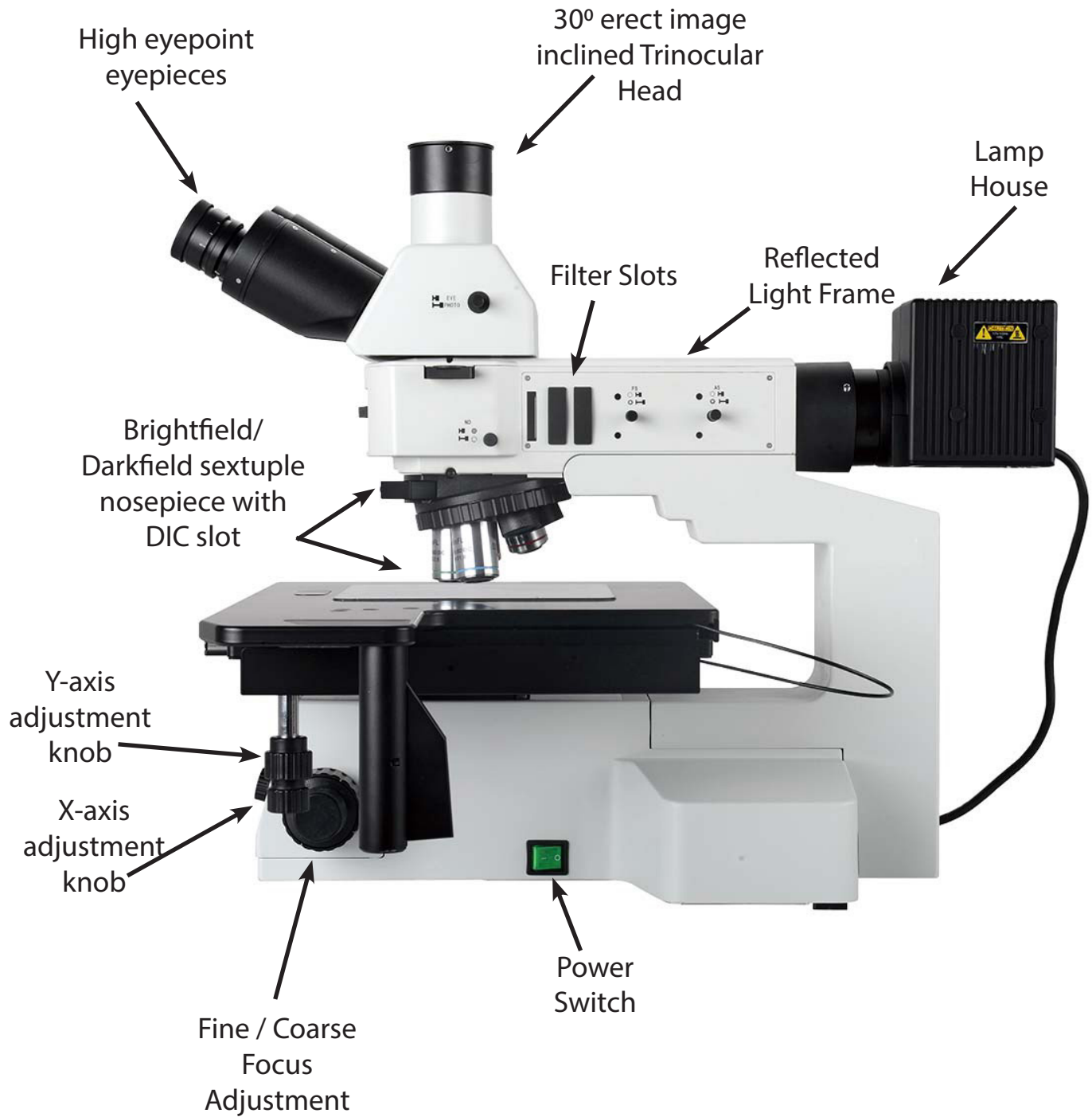


M48 Metallurgical Microscope Semiconductor Inspection User's Manual

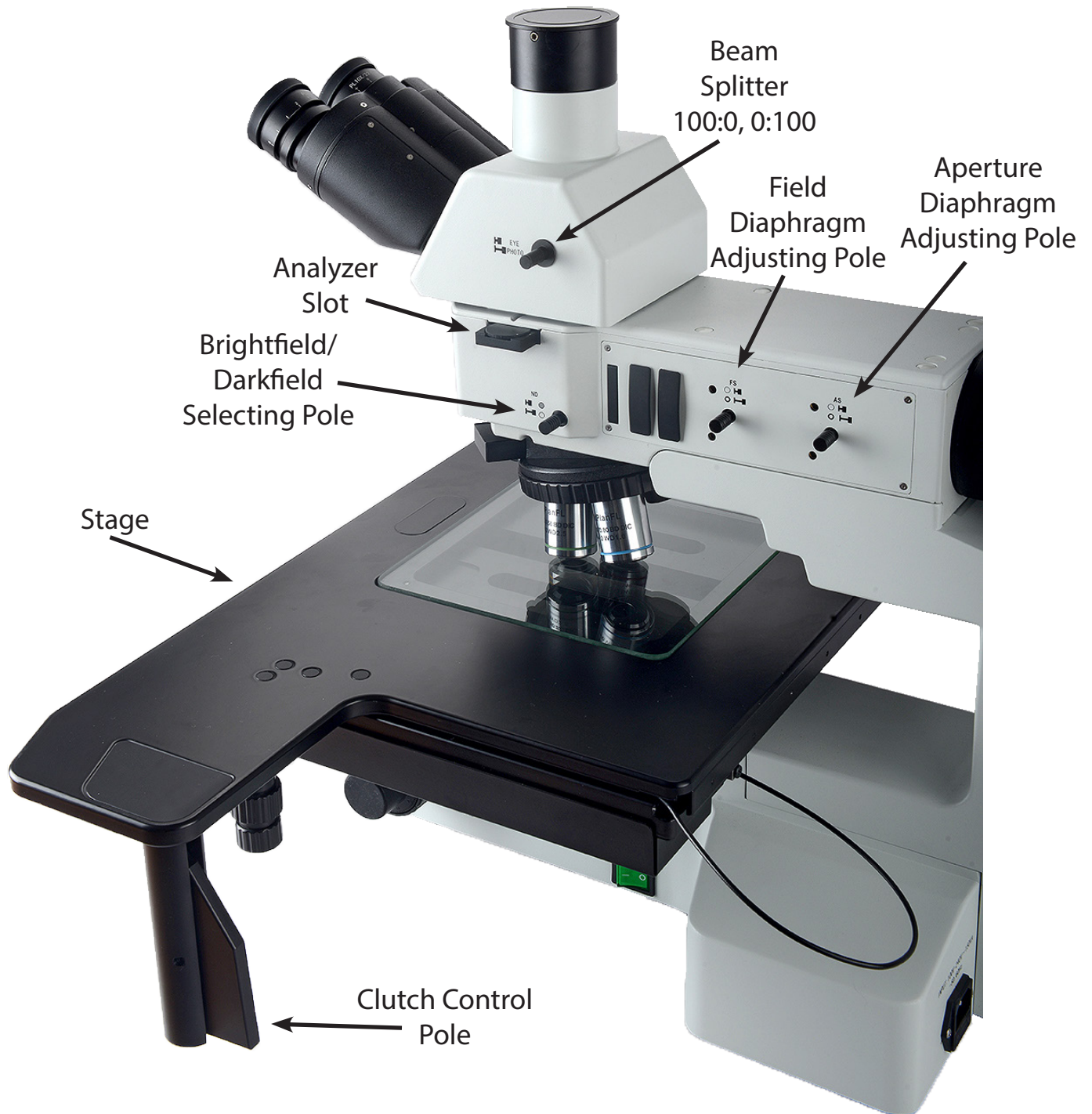


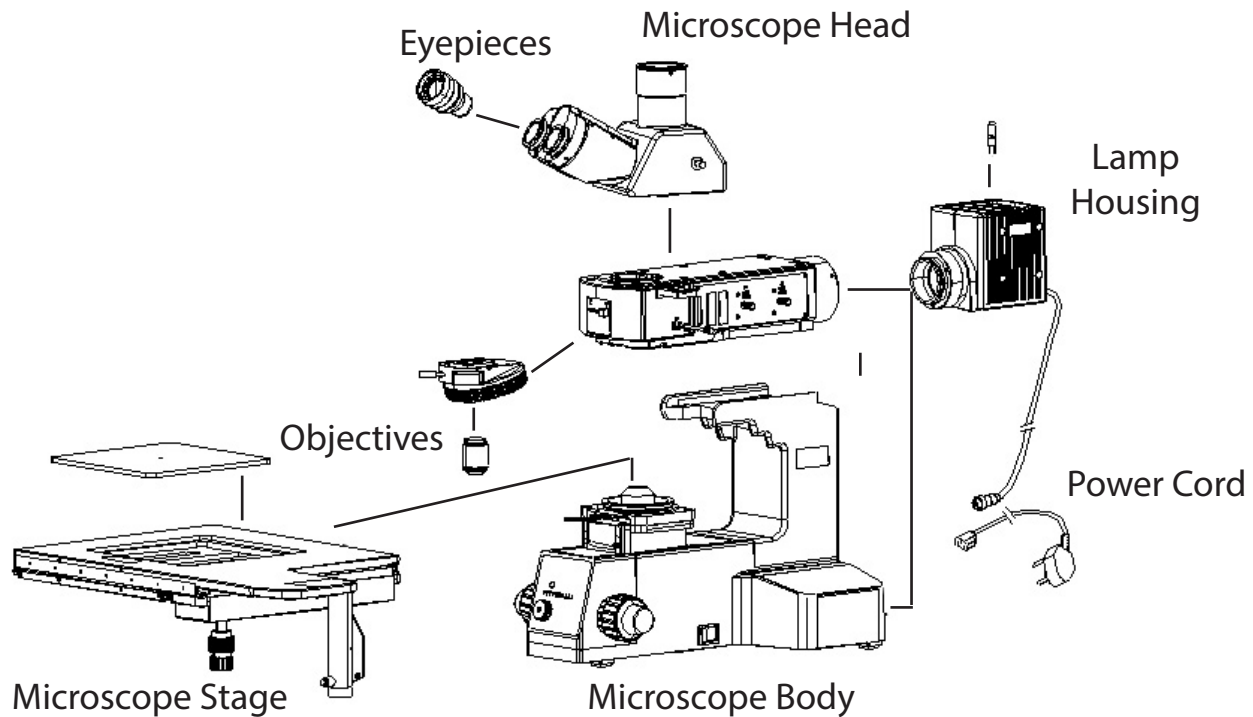
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M48 Microscope Components



M48 Microscope Components



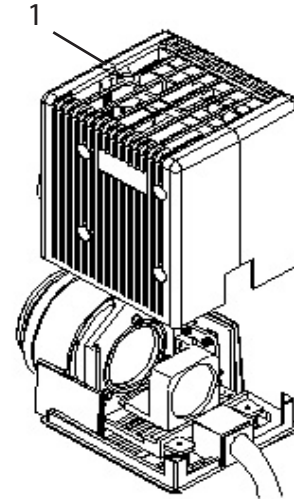


- Connect the microscope head to the microscope frame.
- Connect the lamp housing to the microscope frame.
- Insert the eyepieces into the eyetubes.
- Attach the microscope stage to the microscope frame.
- Secure the microscope nosepiece into the reflective arm of the microscope.
- Screw the objective lenses into the nosepiece.
- Plug the microscope into the outlet with the power cord.

Assemble and Replace the Halogen Bulb

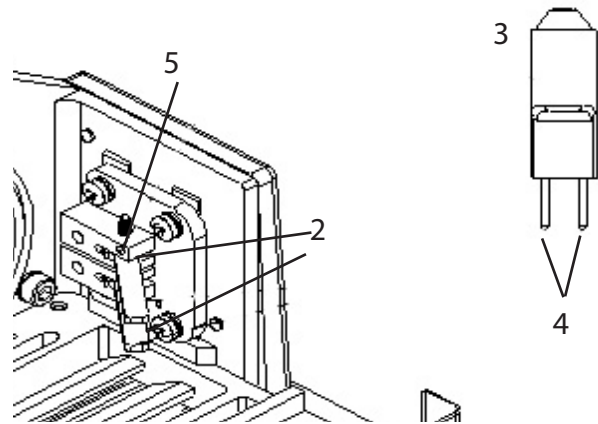


Use the Allen key to loosen the screws (1) and remove the lamp house cover.



Before replacing or installing the bulb, make sure power is cut off to the microscope and the bulb and bulb base are cool to the touch.

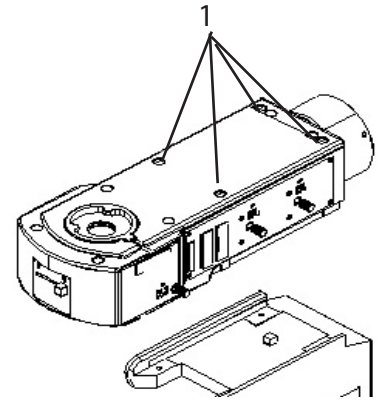
Open the bulb lock piece (2) and remove the bulb (3) with clean a soft tissue. Insert the bulb pins (4) into the jack on the bulb holder (5). The bulb should be vertical after assembly. Loosen the bulb lock piece (2), the bulb will be locked into place. Replace the lamp house cover and secure with screw.



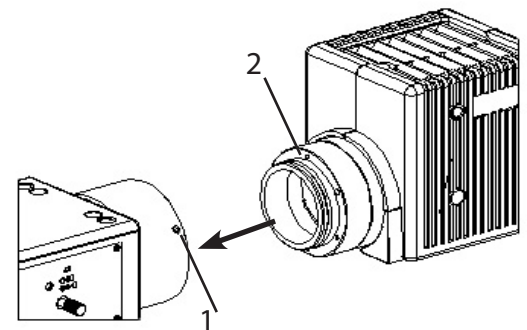
****Do NOT touch the bulb with fingers.**
If fingerprints are left on the bulb, clean with a soft cloth.
Only replace bulb with Fein Optic 12V/100W Halogen bulb.



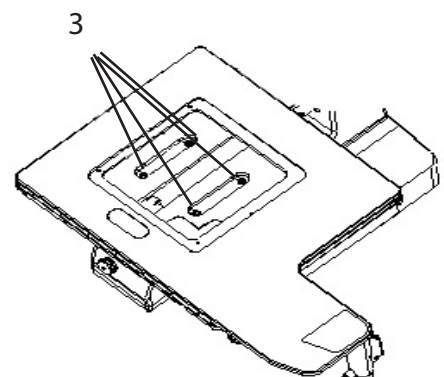
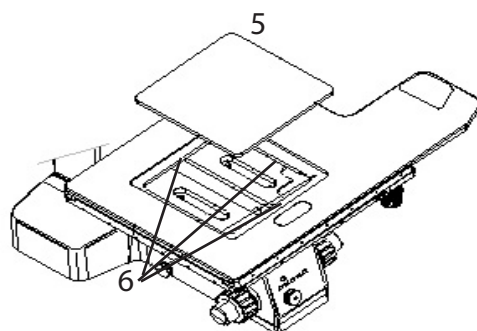
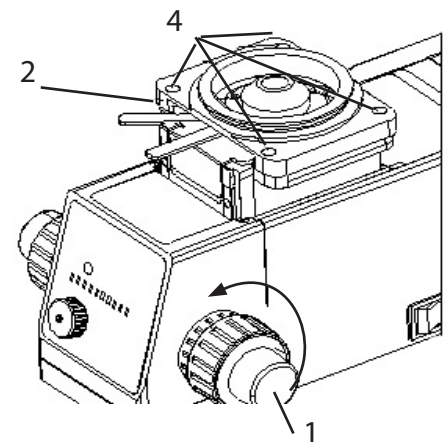
Assemble the Reflected Illuminator arm by removing the four plastic caps (1), revealing the four inner hexagon screws. Position the illuminator arm on the top of the microscope body, aligning the inner hexagon screws with the holes on the microscope body. Secure the illuminator arm in place by tightening the inner hexagon screws. Replace the four plastic caps.



Loosen the set screw (1) on the lamp house connector. Seat the lamp house (2) into the lamp house connector. Secure by tightening the set screw (1).



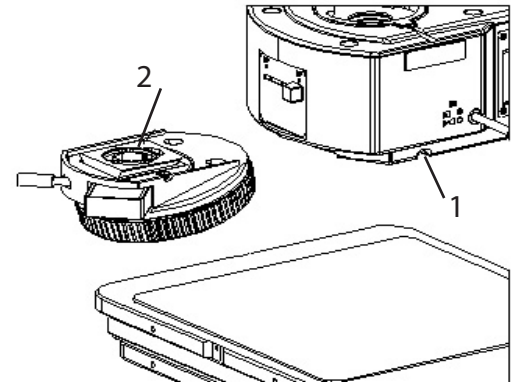
Assemble the stage by rotating the coarse focusing knob (1) in the direction of the arrow, which will lower the stage bracket (2) to the lowest position. Gently place the stage on the center of the stage bracket (2). Align the screw holes (3) of the stage with the screw hole (4) of the stage bracket. Secure the stage with screws. Place the glass platform (5) into the groove of the stage.



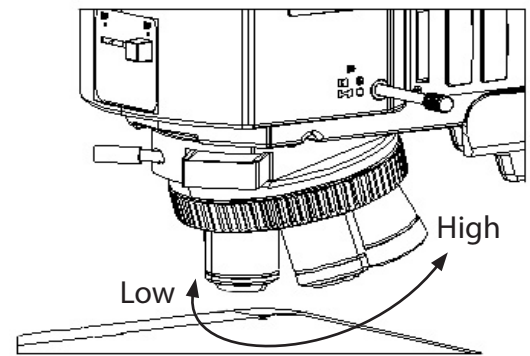
M48 Semiconductor Inspection Microscope Assembly



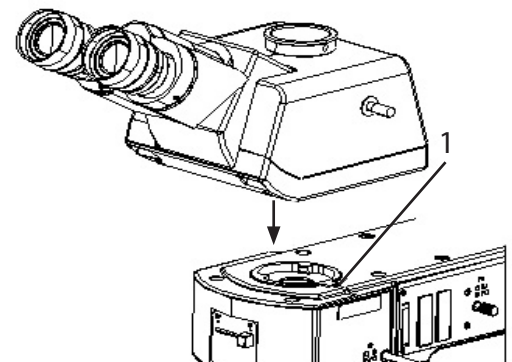
Assemble the nosepiece by loosening the lock screw (1) on the illuminator. Match the dovetail interface (2) of the nosepiece with the dovetail groove of the illuminator, and push it to the innermost position. Tighten the lock screw (1).



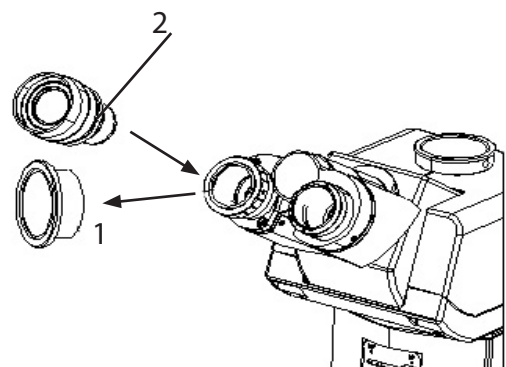
Rotate the coarse focusing knob to lower the stage. Then install the objectives into the nosepiece from the lowest magnification to the highest in the direction shown in the figure.



Assemble the head by loosening the lock-screw (1). Position the microscope head over the illuminator arm aligning the dovetail of the head with the hole in the illumination arm. Tighten lock-screw to secure the microscope head into place.

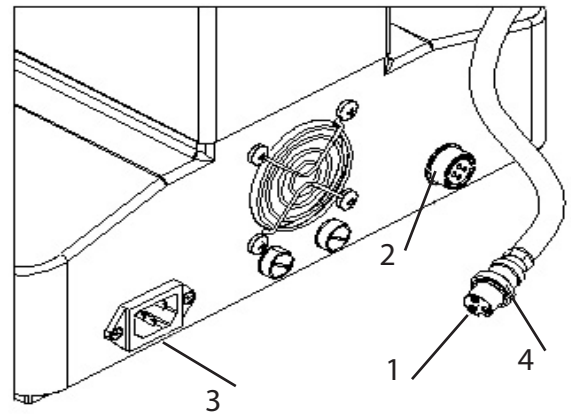


Remove the eyepiece tube covers (1) and insert the eyepieces (2) into the eyetubes until the bottom of the eyepieces is touching the lip of the eyetubes.





Make sure the main power switch is in the "O" off position. Match the plug of the light box power cord connector (1) with the socket of the microscope connector (2), and insert it into connector (2) thoroughly. Then screw down the nut (4). Insert one end of the power cord into the power socket (3) of the microscope.



Do not use strong force when the power cord is bent or twisted to avoid damage.

Only use the power cord supplied with the microscope. Should the power cord become damaged, use a replacement cord with the same specifications.

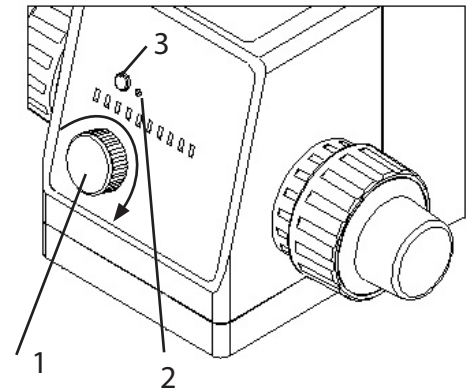
Only connect the power cord to a compatible outlet and ensure the instrument is electrically grounded.

M48 Microscope Operation Instructions

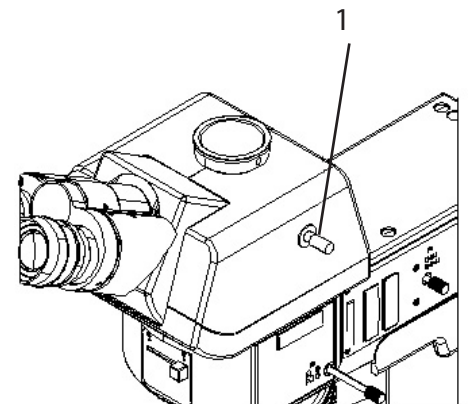


With the microscope powered on, turn the light adjustment knob (1) until the illumination is comfortable for observation. Turn the light adjustment knob clockwise to increase the light intensity and turn counter clockwise to decrease the light intensity.

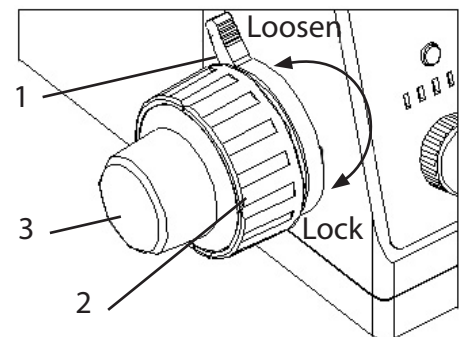
Reset the light intensity by pressing the light intensity reset button (3). Adjust the light intensity by rotating the setting screw (2) with a compatible tool. Rotate clockwise to increase intensity and rotate counter clockwise to decrease intensity.



To select the light path, push the beam splitter (1) to the innermost position allowing the light to be directed to the eyepieces for viewing through the eyepieces. Pull the beam splitter to the outermost position allowing the light to be directed to the trinocular port for viewing with a microscope camera.

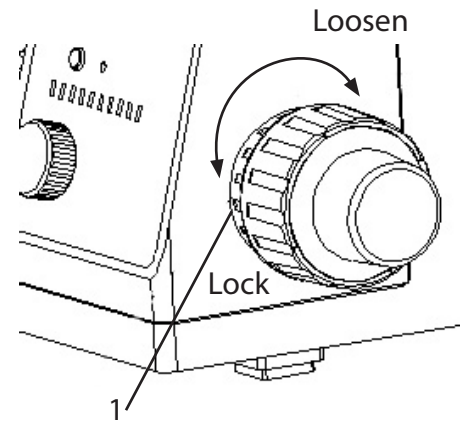


To adjust the focus, place a sample on the stage and position the 5x objective lens into the light path. Loosen the coarse adjusting limit knob (1) and adjust the left diopter adjustment ring to zero. Observe the right eyepiece with the right eye. Rotate the coarse focusing knob (2) until the sample appears in the field of view, then lock the coarse adjusting limit knob. Rotate the fine focusing knob (3) to bring the sample into crisper focus.

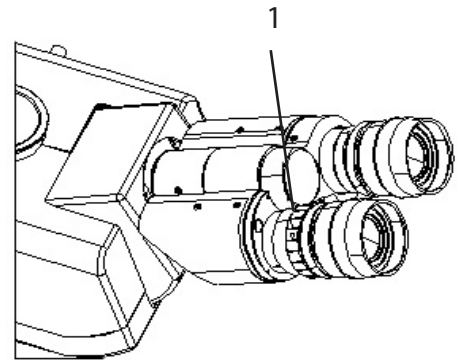




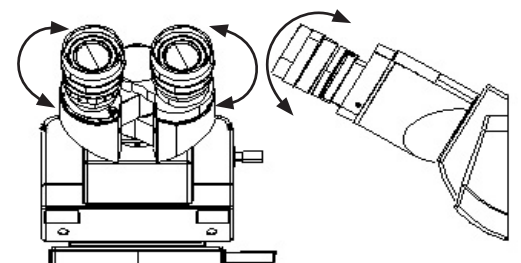
If the handle is heavy when using the coarse focus or the specimen moves out of focus, it may be necessary to tighten the focus knob tension. This can be done by rotating the tension adjustment ring (1) according to the arrows.



After the image is clear in the right eyepiece, observe the specimen through the left eyepiece with the left eye. If the image is not in focus, rotate the diopter adjustment ring (1) until the image is clear. There are +/-5 diopters on the diopter adjustment ring with the value aligned with the scale of your eye's diopter. The dot "•" on the left side can also indicate the setting. When using the diopter adjustable eyepiece, first set the eyepiece diopter to zero. The eyepiece diopter can continue to be adjusted while operating the microscope to achieve a clear image.

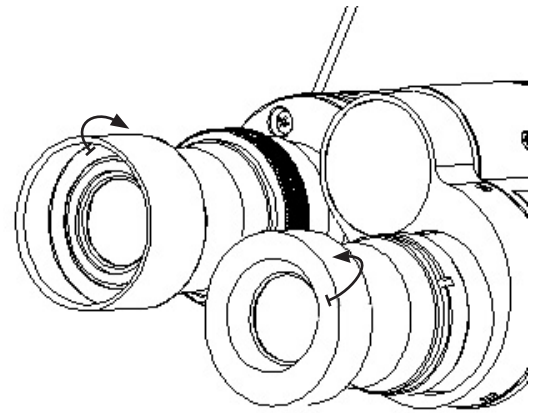


Adjust the interpupillary distance by holding the base of the eyepiece on the left and right and pull them up or down to adjust to your sitting position. Hold the base of the eyepieces and rotate them around the axis to adjust the interpupillary distance until there is one field of view and comfortable for observation.



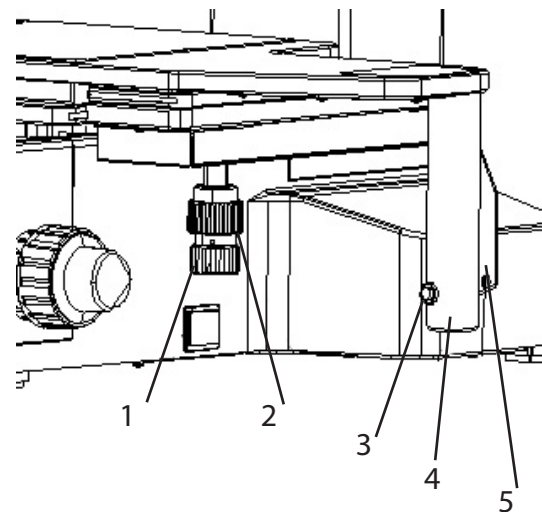


Turn down the eyecups if the observer is wearing glasses to prevent the glasses touching the eyepieces and avoid damaging the glasses and eyepieces. Open the eyecups if the user doesn't wear glasses to prevent stray light from disturbing the observation.



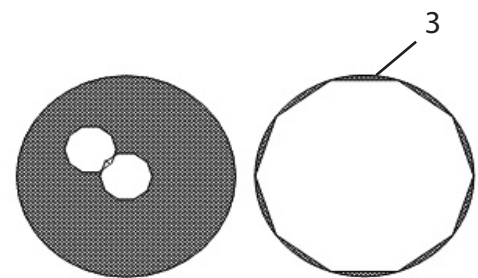
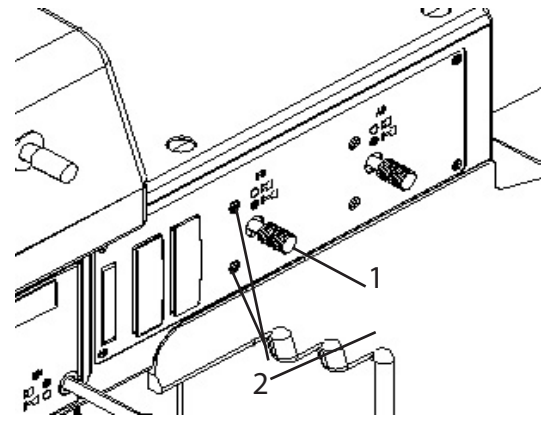
To adjust the stage, place the sample on the stage and move the 5x objective into the light path. Rotate the X-axis moving knob (2) and the Y-axis moving knob (1) of the stage, to move the sample to the center position (aligned with the center of the objective).

If the position of the sample to be moved when the multi-sample is observed is far from the center of the objective lens, the fast-moving platform function can be used. The operation method is as follows: First press and hold the clutch lever (5) toward the handle (5), then release it, then the handle (4) can quickly move in both directions of the platform XY. To turn off the fast-moving function, press the shift speed switch button (3), reset the clutch lever (5), and the fast-moving function stops. Mechanical platform X, Y axis movement range is 158 x 158mm.

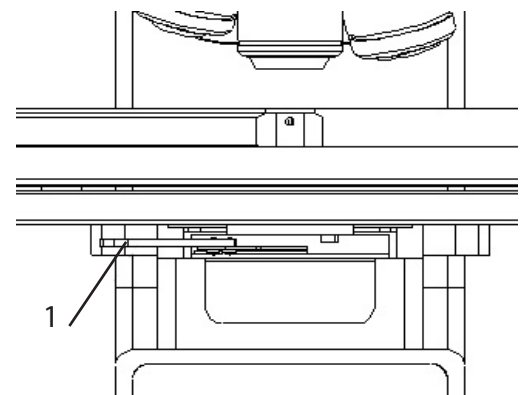
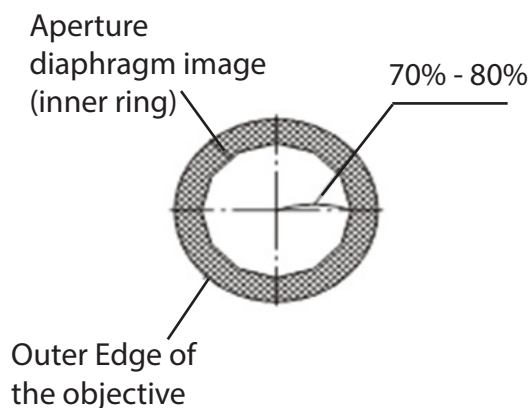
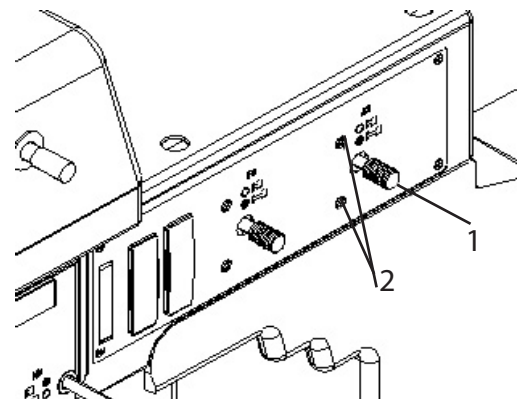




To adjust the field diaphragm, pull the field diaphragm adjustment pole (1) to the outermost position. The image of the field diaphragm can be observed in the view field through the eyepieces. Adjust the two field diaphragm centering screws (2) until the image of the field diaphragm is in the center of the field of view. Gradually open the field diaphragm until the image of the field diaphragm is overlaid with the field of view (3).



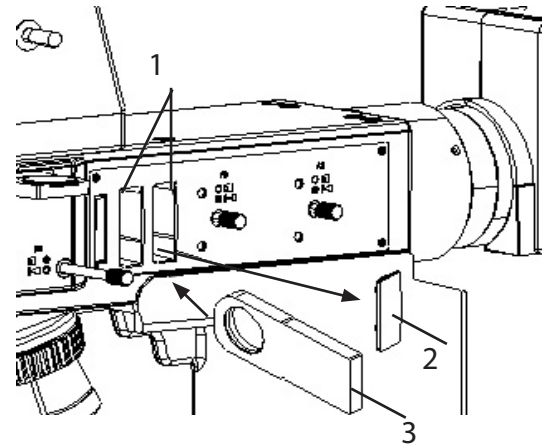
Adjust the aperture diaphragm by using the aperture diaphragm adjusting pole (1) and adjusting the aperture diaphragm centering screws (2) on the side of the illuminator arm with the hexagon tool. Adjust the screws so the image of the aperture diaphragm is centered on the field of view. Adjust the aperture diaphragm adjusting pole (1) until the image below is achieved.



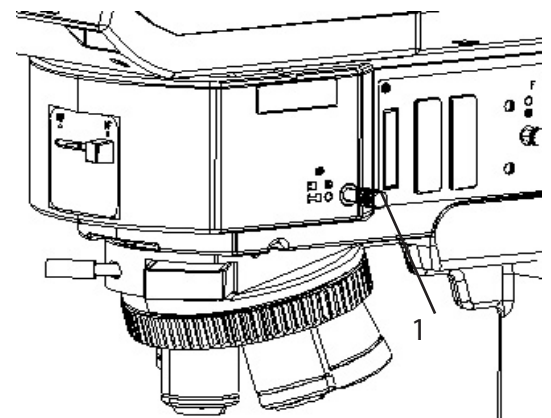
M48 Microscope Operation Instructions



When using an external color filter or ND filter, first remove the dust cover (2). Insert the filter slider (3) into the filter holder (1). When filters are not in use, replace the dust cap to prevent dust build up in the filter slots.



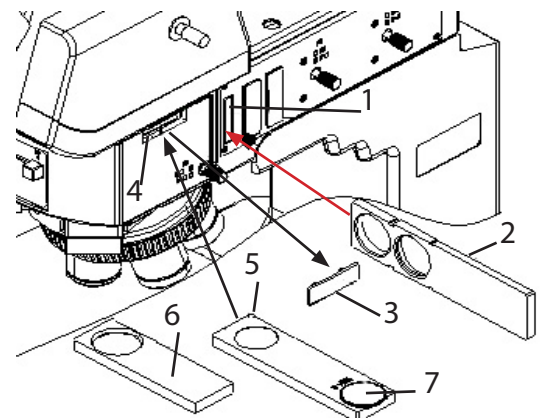
If an internal ND50 color filter is used, push the pole (1) into the innermost position, this will move the filter into the light path. If the pole is in the outermost position the filter will be moved out of the light path.



The simple polarizer device includes the polarizer and the analyzer. Remove any color filters when using the polarizer. Remove the dust cap (1), then insert the polarizer (2) into the filter slot. The polarizer is moved into the light path when two clicking sounds are heard.

Remove the dust cap (3) from the analyzer slot (4), insert the 360° rotating analyzer (5) or fixed analyzer (6) into the analyzer slot (4) until it is fully seated within the slot.

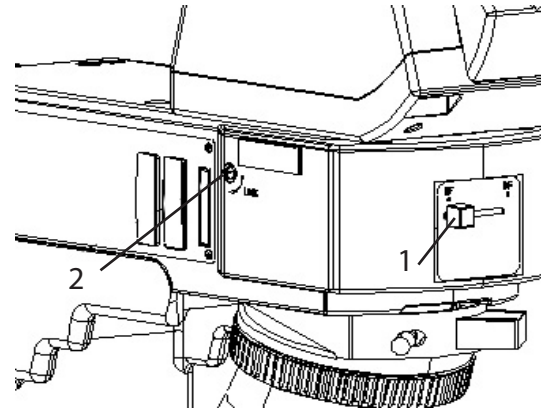
The polarizer and the analyzer are orthogonal when the 360° rotating analyzer is in the zero position, or when the fixed analyzer is used. Dialing the rotatable analyzer drive plate (7) can change the orthogonal state of the polarized light.



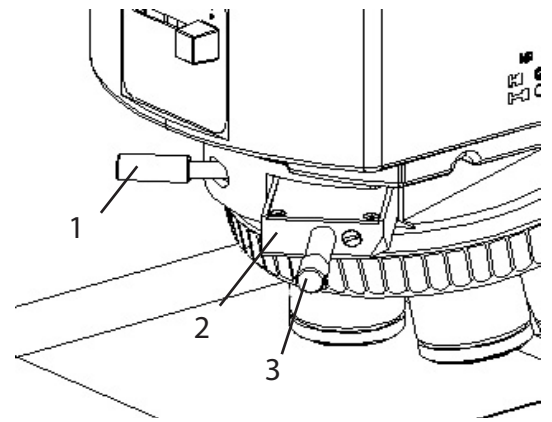
M48 Microscope Operation Instructions



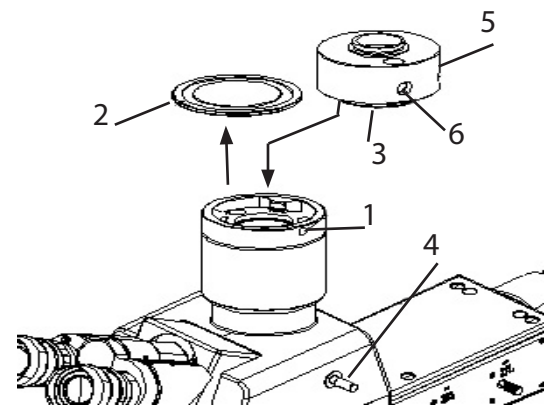
Switch between brightfield and darkfield by moving the knob (1). When the knob is positioned to the left, brightfield observation is selected. When the knob is positioned to the right, darkfield observation is selected. When darkfield observation is selected, open the aperture diaphragm and field diaphragm to the maximum position.



To use the DIC components, ensure the microscope is set to brightfield observation, bring the specimen into focus using the 10x or 20x objective. Push the polarizer and the analyzer into the light path and ensure they are orthogonal. Loosen the lock screw (1) remove the dust cap and insert the DIC slider (2). Tighten the lock screw (1) to secure the DIC slider. Rotate the fine adjustment knob (3) to unify the interference colors in the field of view. Choose the suitable background interference color to achieve the best differential interference contrast image. Fine adjustment knob (3) can adjust the background interference color from gray to mauve.



Install the c-mount adapter to attach a microscope camera by loosening the lock screw (1) and remove the dust cap (2). Remove the two dust caps of the adapter (3). Insert the adapter into the trinocular head and tighten the lock screw (1). Connect the camera to the adapter. Move the beam splitter to the outermost position which allows the light to travel up the trinocular tube for observation with the camera. If the image is unclear, loosen the lock screw (5) adjust the focusing screw (6) until the image is clear, then tighten the lock screw (5).



M48 Microscope Troubleshooting:

TROUBLE	POSSIBLE CAUSE	SOLUTION
The bulb is bright but it is dark in field of view	Field diaphragm is not large enough.	Adjust the field diaphragm.
	Polarizer or analyzer is in use.	Remove them.
The side of the field of view is dark or not even	The nosepiece is not in the correct position.	Turn the nosepiece to the correct position.
	Stain or dust has accumulated on the lens (objectives or eyepieces).	Clean the lens.
	The color filter, polarizer or analyzer is not in the correct position.	Insert them or move out of the light path.
	Bright and darkfield selecting pole is not in the correct position.	Pull it to the correct position.
	Beam splitter is not in the correct position.	Pull it to the correct position.
Stain or dust is observed in the field of view.	Stains have accumulated on the specimen.	Clean the specimen.
	Stains have accumulated on the lens.	Clean the lens.
Unclear Image	The specimen is not vertical to the objective.	Adjust it.
	The aperture is not opened correctly.	Adjust it.
	Stain or dust has accumulated on the lens of eyepiece.	Clean the lens.
	Bright and darkfield selecting pole is not in the correct position.	Pull it to the correct position.
	Beam splitter is not in the correct position.	Pull it to the correct position.
One side of the image is dark or the image moves while focusing.	The specimen slide is not fixed.	Fix it with clips.
	The nosepiece is not in the correct position.	Turn the nosepiece into the correct position.
The eyes feel tired easily. The right field of view doesn't superpose with the left one.	Interpupillary distance is incorrect.	Adjust the interpupillary distance.
	Diopter adjustment is incorrect.	Adjust the diopter.
	The eyepiece for the right eye is different from the left one.	Use the same eyepieces.

M48 Microscope Troubleshooting:

TROUBLE	POSSIBLE CAUSE	SOLUTION
The objective touches the cover glass while turning the nosepiece from low magnification to high.	Stage is too high.	Lower it to an appropriate position.
Coarse focusing knob is too tight	Tensions adjustment ring is too tight.	Loosen it to an appropriate position.
Stage declines itself and cannot stay on the focal plane	Tension adjustment ring is too loose.	Tighten it to an appropriate position.
Coarse focusing knob cannot rise	The coarse limit knob is locked.	Loosen the coarse limit knob.
The image moves obviously when touching the stage.	The stage is fastened incorrectly.	Fasten the stage correctly.
The bulb doesn't work.	No power supply.	Check the connection of the power supply.
	The bulb is not installed correctly.	Install it correctly.
	The bulb burned out.	Replace it.
The bulb burns out often.	The wrong bulb is used.	Replace it with the correct bulb.
The illumination is not bright enough.	The wrong bulb is used.	Replace it with the correct bulb.
	The use of light adjustment knob is wrong.	Adjust it correctly.
The bulb flickers or the brightness is not stable.	The bulb will burn out soon.	Replace it with a new one.
	The wire doesn't connect well.	Connect it correctly.

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