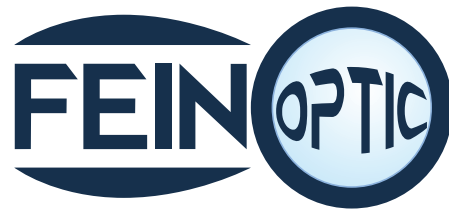


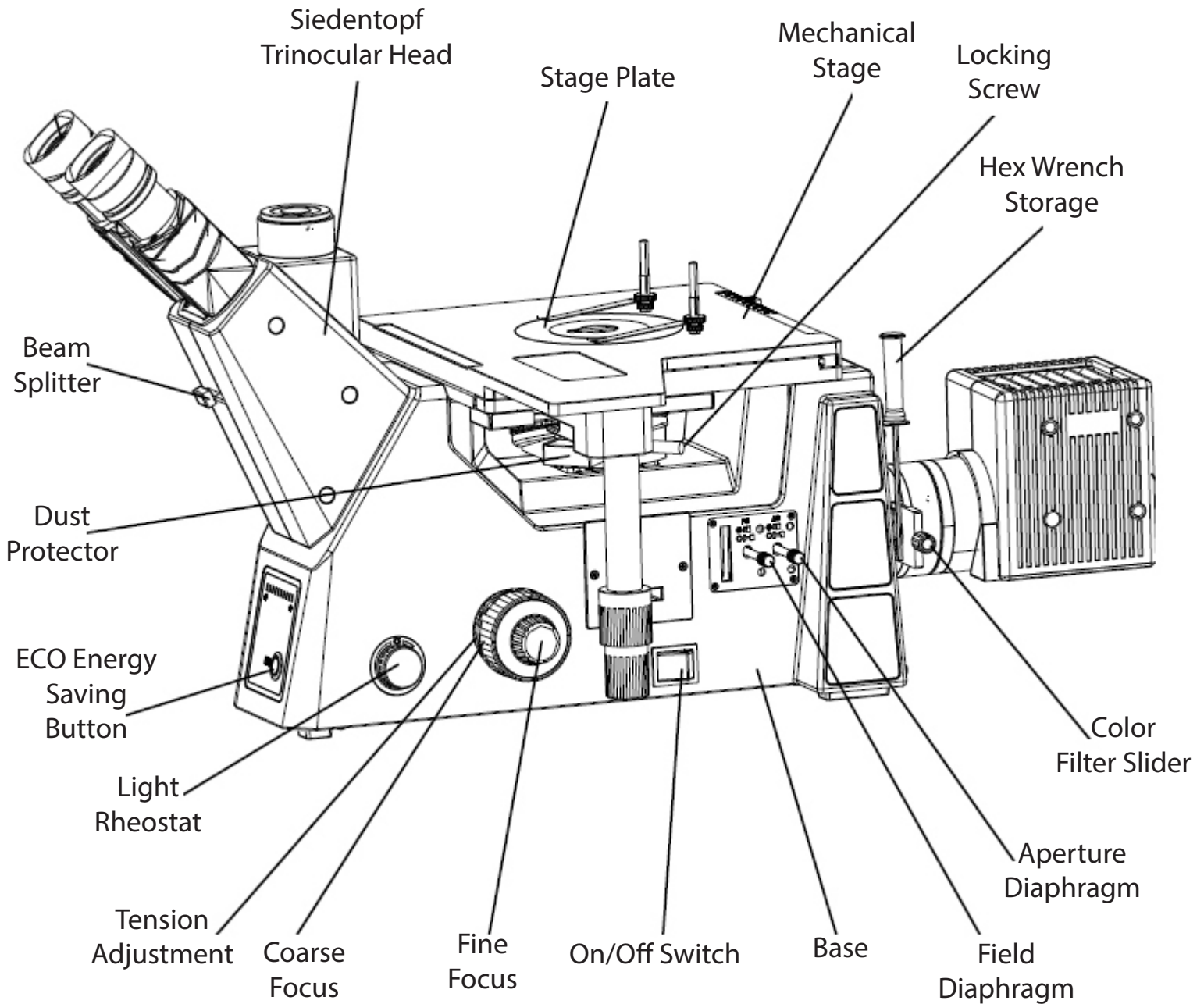
# Mi50 Inverted Microscope User's Manual

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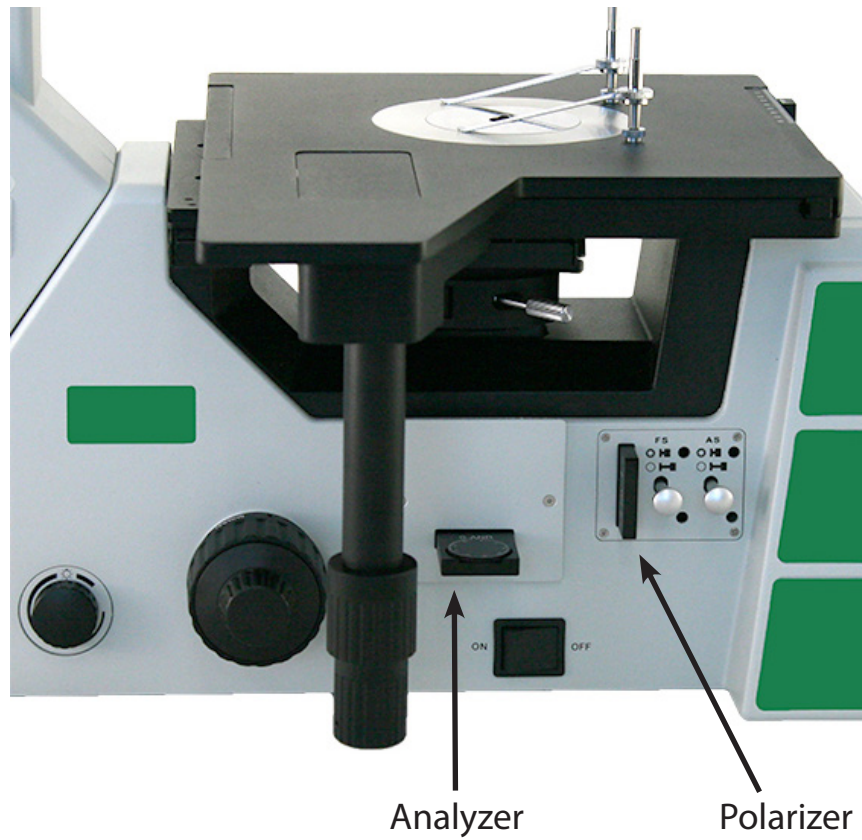
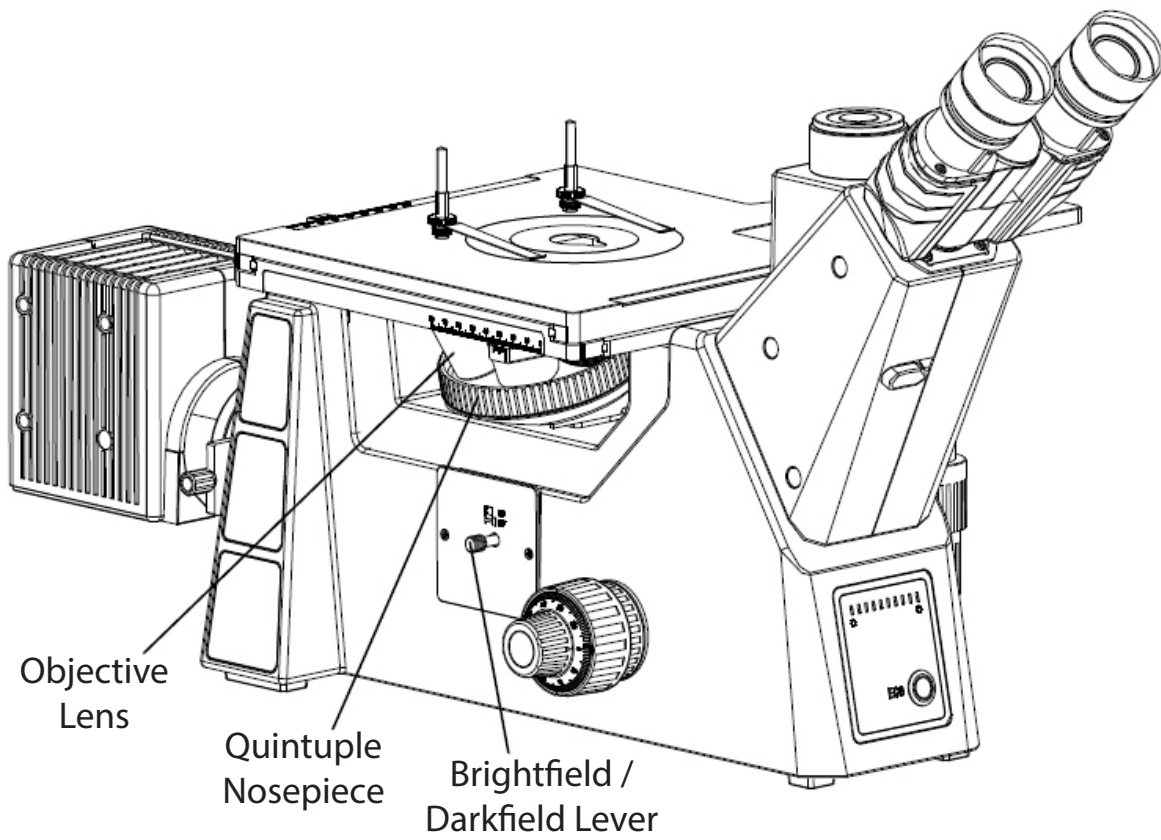


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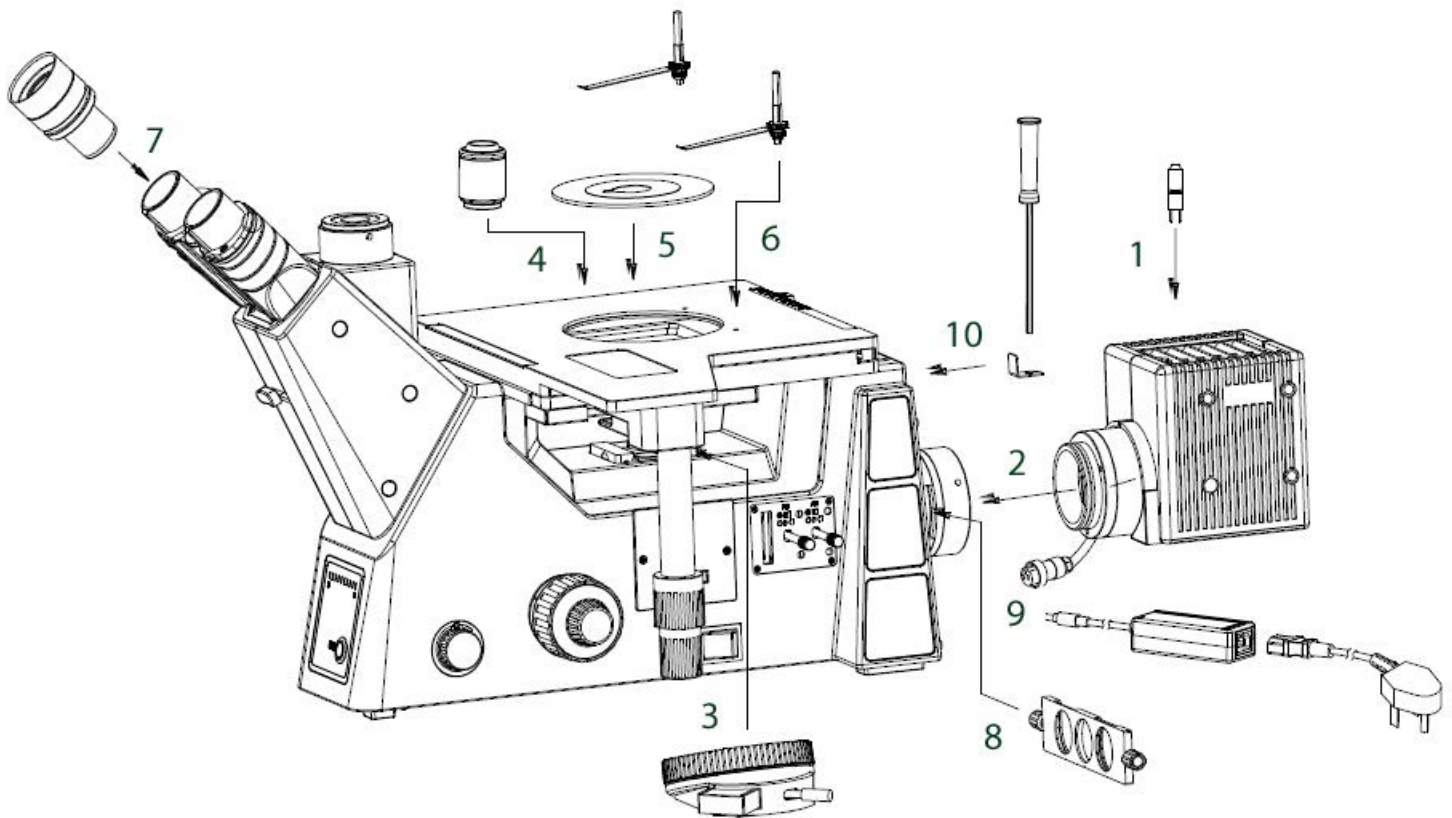
# Mi50 Microscope Components



# Mi50 Microscope Components



# Mi50 Inverted Microscope Assembly



1. Install the bulb into the lamp housing.
2. Connect the lamp housing to the microscope frame.
3. Connect the nosepiece to the frame.
4. Screw the objective lenses onto the nosepiece.
5. Insert the stage plate.
6. Connect the stage clips.
7. Insert the eyepieces into the eyetubes.
8. Insert the color filter slider into the illuminator port.
9. Connect the power cord.
10. Place the inner hex spanner into its holder on the frame.

NOTE: Each of the above installation steps is outlined in detail on the following pages.

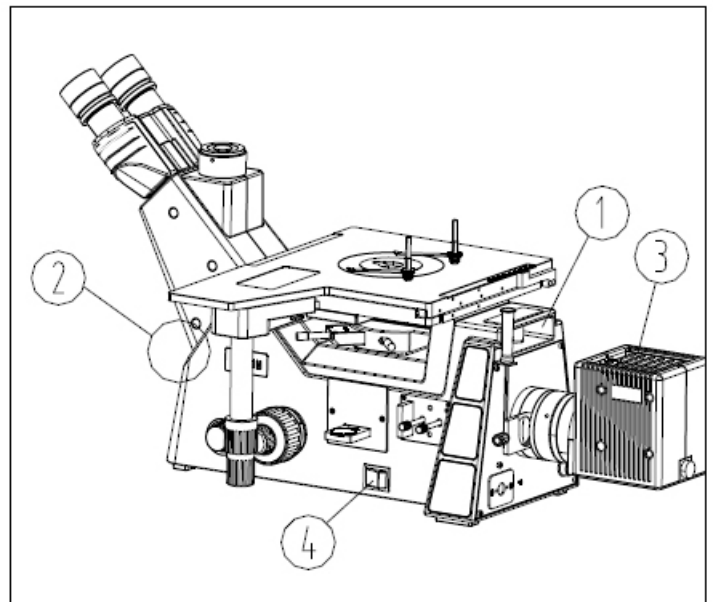
# Mi50 Inverted Microscope Operation Instructions



Do not shake or drop the microscope.



Do not expose the microscope to direct sun, high temperatures, high humidity, dust, or damp environments. Use a flat work surface.



When moving the microscope use both hands, holding the handle at the back (1) and the frame at the front (2) as shown in the image at right. Do not carry by holding stage.



When working make sure there is plenty of room for heat dissipating around the light source (3).



Set the power switch (4) to off "O" before replacing a bulb or fuse, and wait until the lamp is cool. The power switch is located on the side of the microscope. Microscope uses 12v, 100w Halogen bulb. (Part #12v100wH).



Voltage range of 100~240V is supported. Use the power cord supplied with the microscope.



Operating indoor temperature should be 5°C~40°C (41°F~104°F), with a max relative humidity of 80%.

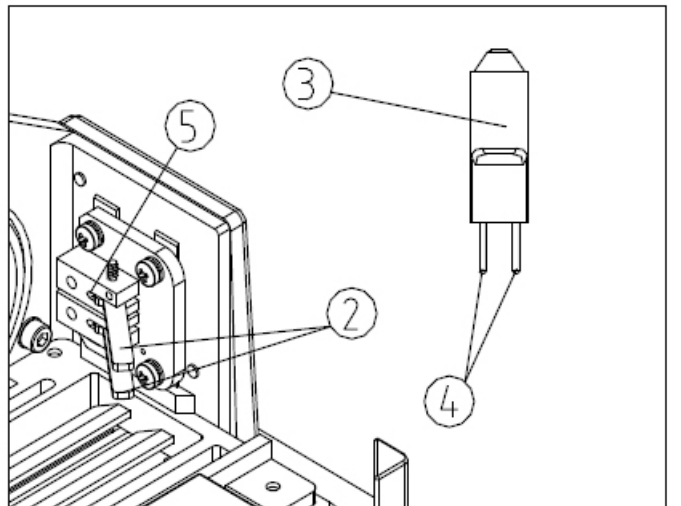
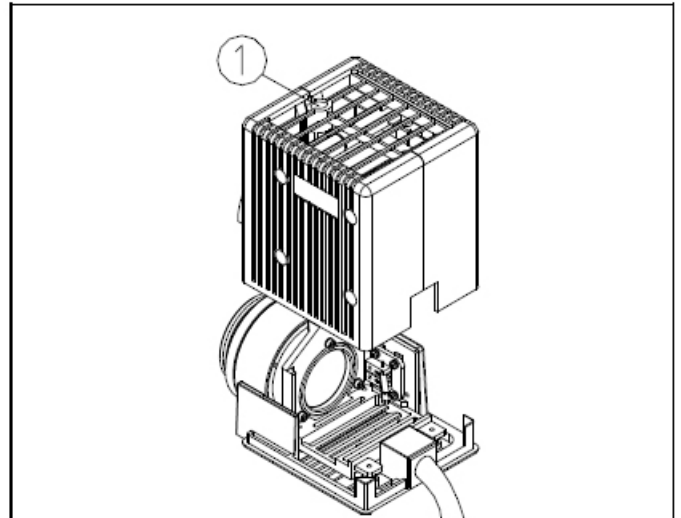
# Mi50 Inverted Microscope Bulb Replacement



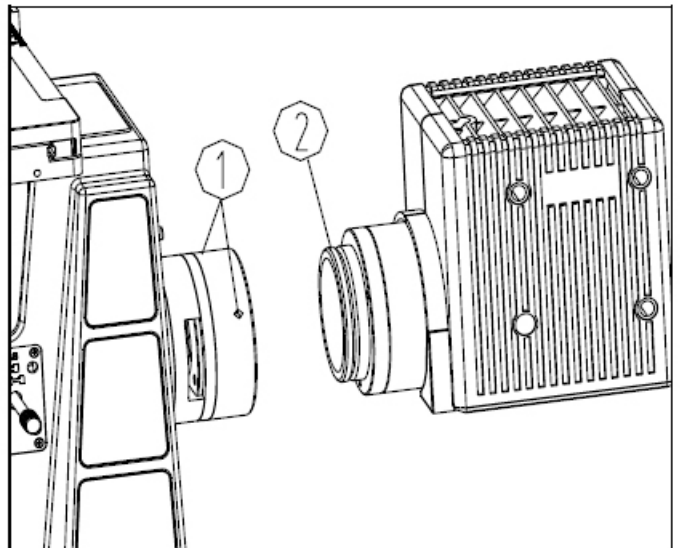
Power off and unplug the microscope. Loosen the set screw (1) and remove the lamp housing.



Open the bulb locking mechanism (2) and holding the bulb (3) with a soft tissue, insert the bulb pins (4) into the bulb holder (5). The bulb will be vertical after assembly. Put the bulb locking mechanism (2) back into its original position, lock the bulb and install the lamp housing by tightening the set screw (1).

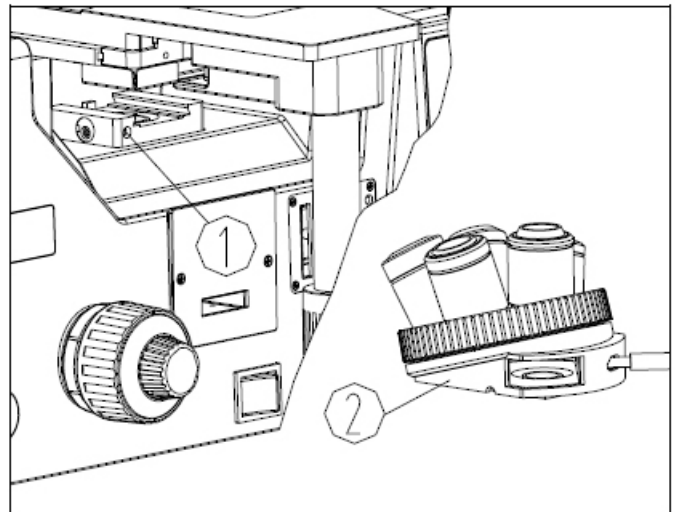
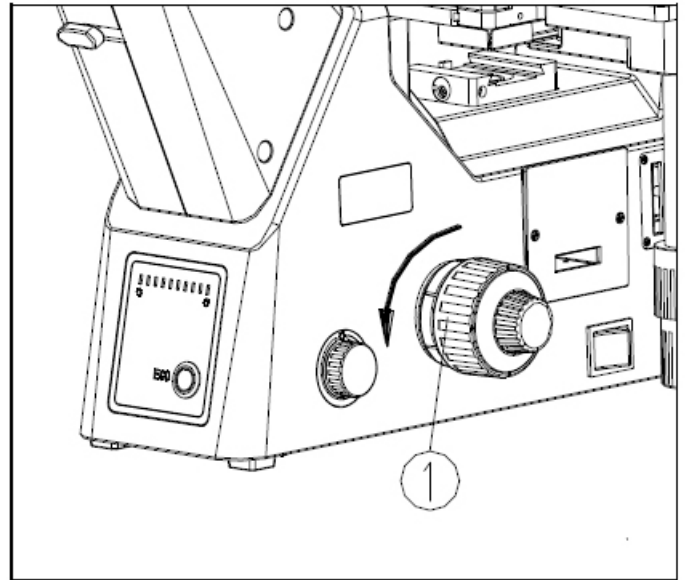


Connect the lamp housing to the microscope frame. Loosen the set screw (1) on the light source connector. Push the lamp housing socket (2) into the connector thoroughly, and re-tighten the set screw (1).



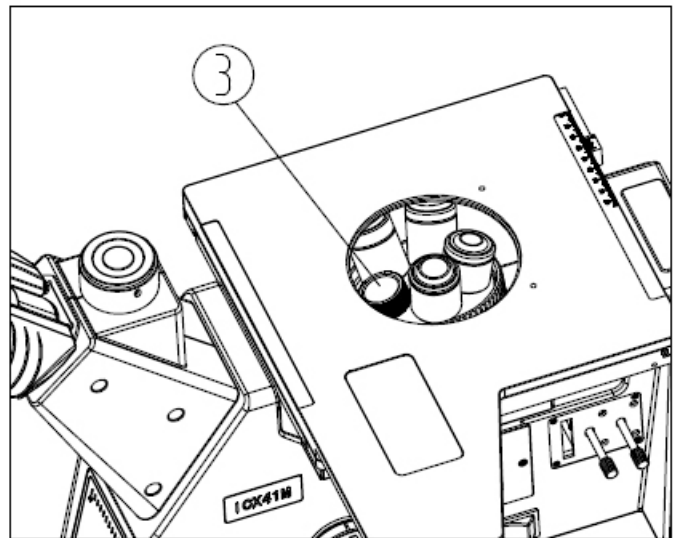
## ASSEMBLE THE NOSEPIECE:

Rotate the coarse focus knob (1) until the focusing slider is raised to the position where the locking screw (1 below) can be rotated with a screw driver. Loosen the lock screw on the focusing slider. Match up the dovetail interface (2) of the nosepiece with the dovetail groove of the illuminator, pushing it in all the way. Re-tighten the lock screw (1).



## CONNECT THE OBJECTIVES:

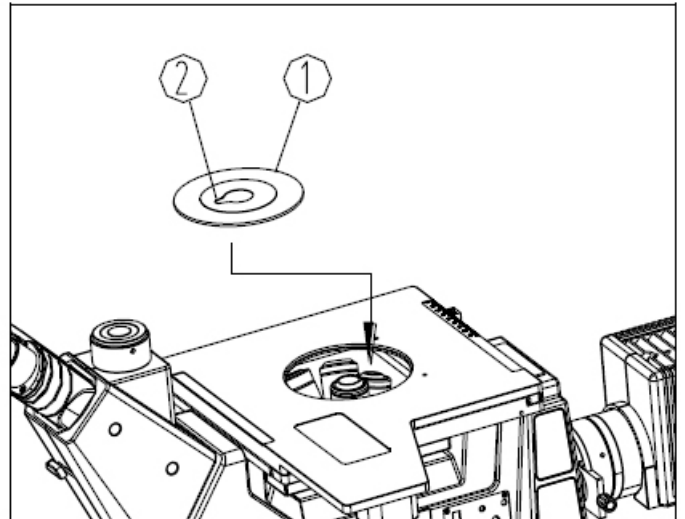
Rotate the coarse focusing knob to lower the nosepiece. Install the objective lenses into the microscope nosepiece starting with the lowest magnification objective up to the highest in a clockwise direction. If nosepiece slots are not being used cover them with a dust cover. When viewing samples always start focusing with the lowest magnification objective, and then move up in magnification.



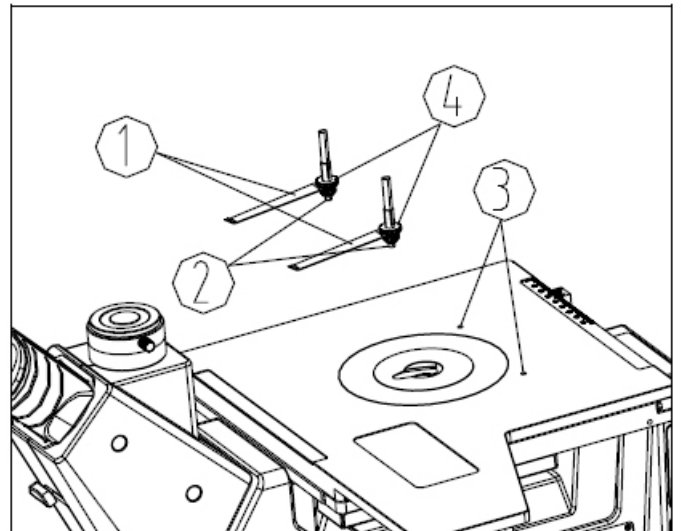
# Mi50 Inverted Microscope Operation Instructions



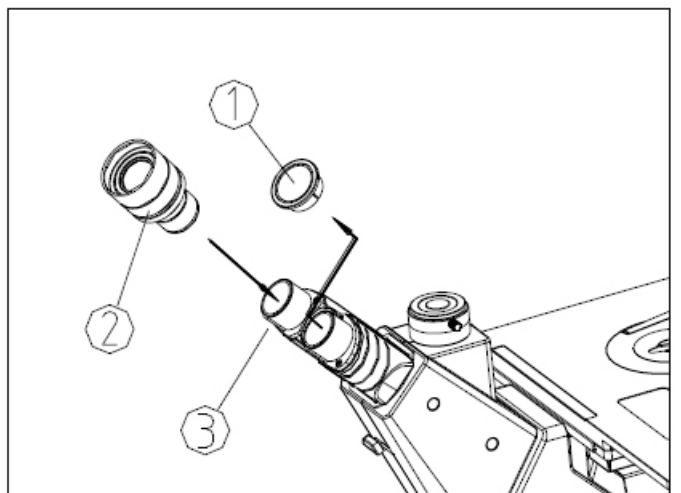
Insert the metal stage plate (1) into the hole in the top of the stage. Turn the stage plate so that "V" groove (2) is closest to the eyepieces. This makes it easier to view the objective lenses.



Remove the clips (1) from the support columns (2). Screw the support columns (2) into the holes (3) of the mechanical stage. These can be locked in place with the screws (4). Finally, insert the clips (1) back into the support columns (2) and face them toward the eyepieces.



Remove the eyepiece dust caps (1). Insert the eyepiece (2) into the eyetube (3). If using the diopter adjustable eyepiece, it can be locked into place by using the hex screw so it will not rotate when adjusting the diopter.

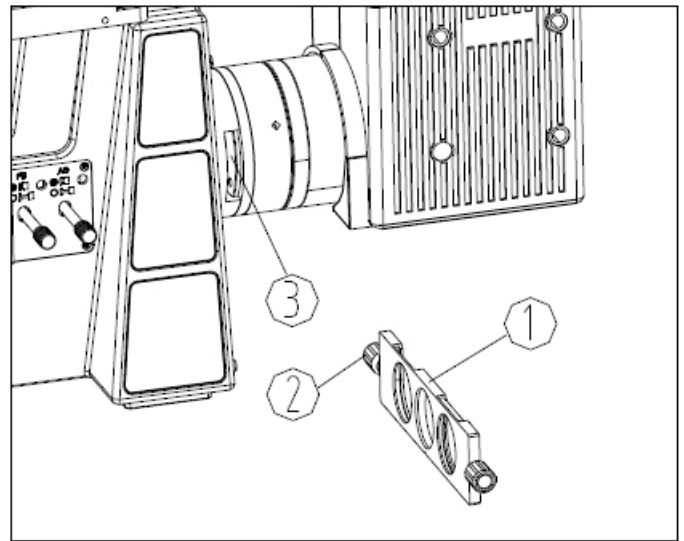




# Mi50 Inverted Microscope Operation Instructions



Install the color filter slider (1) by unscrewing and removing one of the handles on the slider (2). Insert the filter slider into the slot (3) on the illuminator connector. When the slider clicks into place it is aligned in one of the proper operating positions. Screw the handle (2) back onto the filter slider once it is inserted.



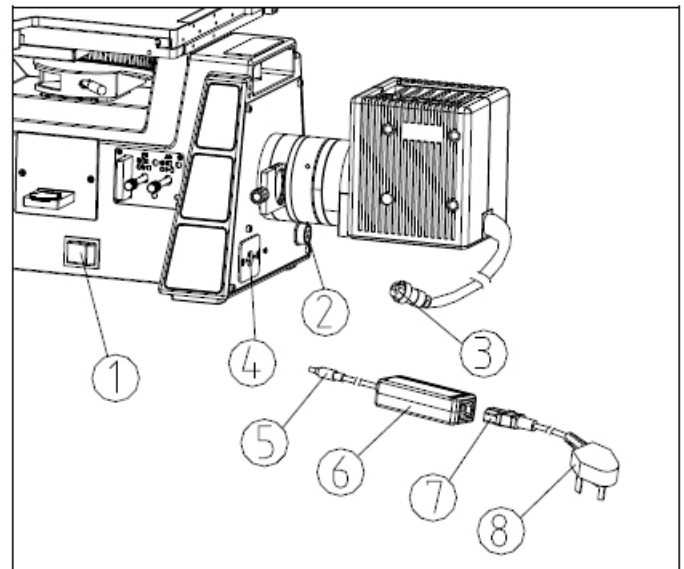
Turn the main power switch (1) to "O" off. Insert the lamp house plug (3) into the socket (2).

Insert the plug (5) of the external power supply (6) into the power supply socket (4).

Insert the plug (7) of the power cord into the socket of the external power supply (6).

Insert the plug (8) of the power cord into the wall outlet.

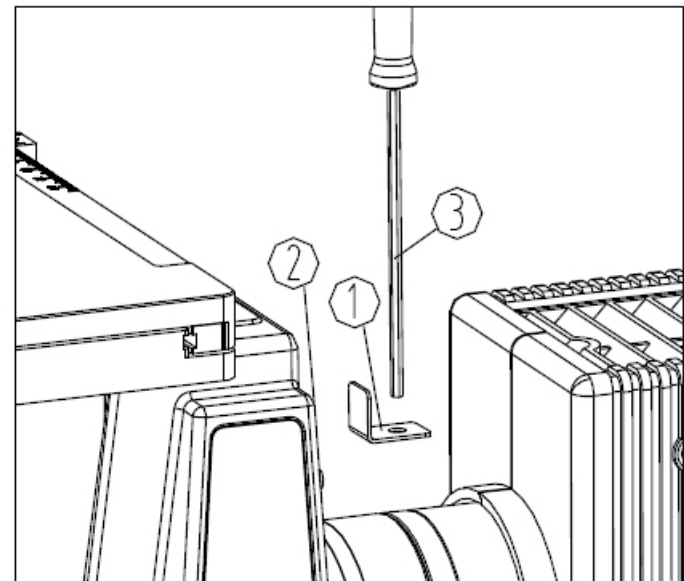
Use the power cord supplied with the microscope, do not substitute.



## HEX WRENCH HOLDER:



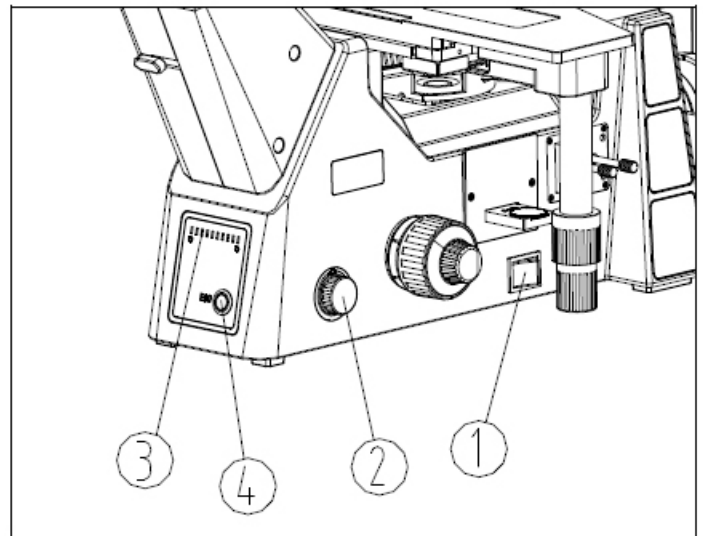
Grip the inner hex spanner fixed mount on the magnet (2) of the microscope body. Insert the hex wrench (3) into the hold of the inner hex spanner fixed mount (1).



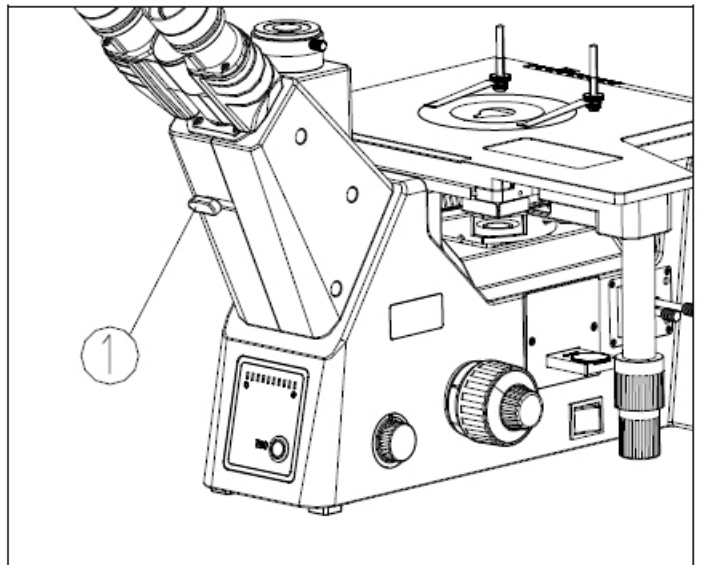
# Mi50 Inverted Microscope Operation Instructions



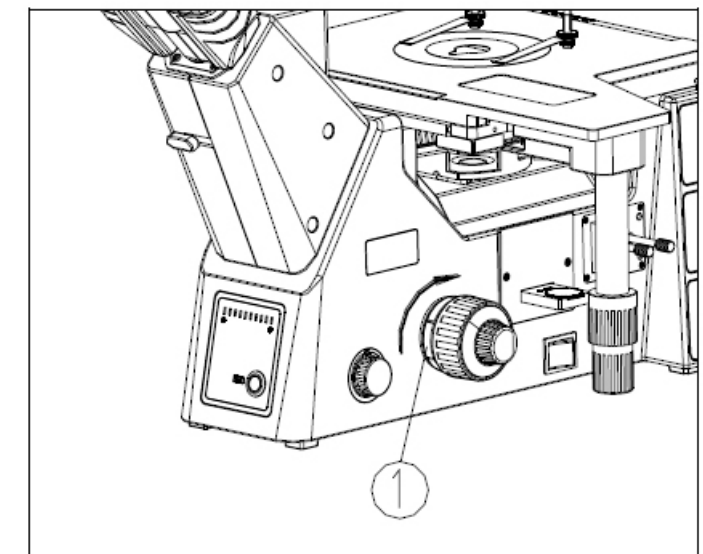
Plug in the power cord and turn the microscope on (1). Adjust the rheostat knob (2) until the illumination is comfortable for observation. Rotate clockwise to increase brightness, which in turn will increase the brightness readout (3). Using the microscope at a lower brightness will increase bulb life. Press the ECO energy saving button (4) to turn on the energy saving function. This automatically turn off the microscope light after 30 minutes of use when the user leaves the microscope. When the user returns to the microscope, the light will automatically turn on.



The beam splitter (1) controls the light direction from the eyepieces to the camera. When the beam splitter is all the way to the left the light is 0:100, with 0% of the light at the eyepieces and 100% at the trinocular port for photography. When the beam splitter is moved to the right, all light is directed to the eyetubes.



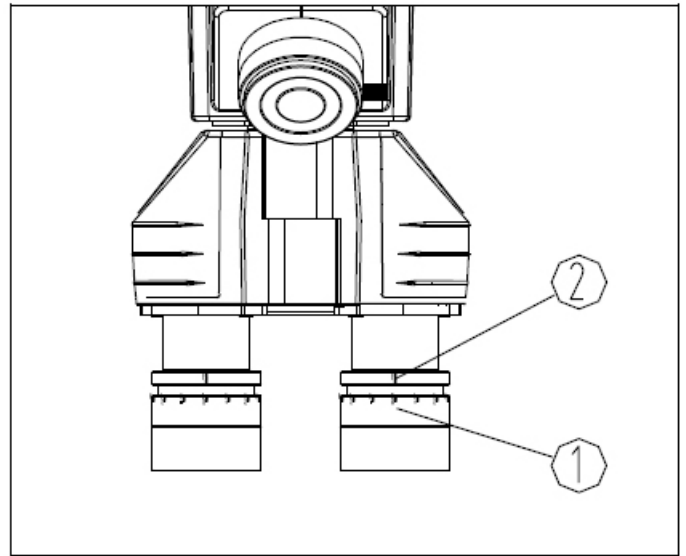
**FOCUS TENSION ADJUSTMENT:**  
If the coarse focus knob is hard to turn, or the specimen leaves the focus plane soon after focusing, the tension adjustment ring (1) needs to be adjusted. Rotate the ring clockwise to tighten focus, counter-clockwise to loosen the tension.



# Mi50 Inverted Microscope Operation Instructions

## DIOPTER:

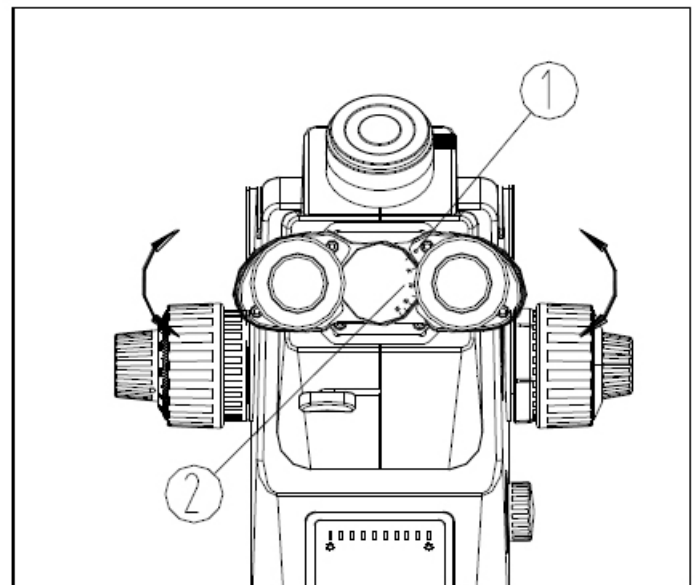
Align the scale on the diopter ring (1) to "0" with the scale on the eyepiece (2) and focus the image so it is clear. While looking through the other eyepiece, if the image is unclear rotate the diopter ring of that eyepiece until the image is clear. If multiple users are using the same microscope, remember your diopter settings.



## INTERPUPILLARY DISTANCE:

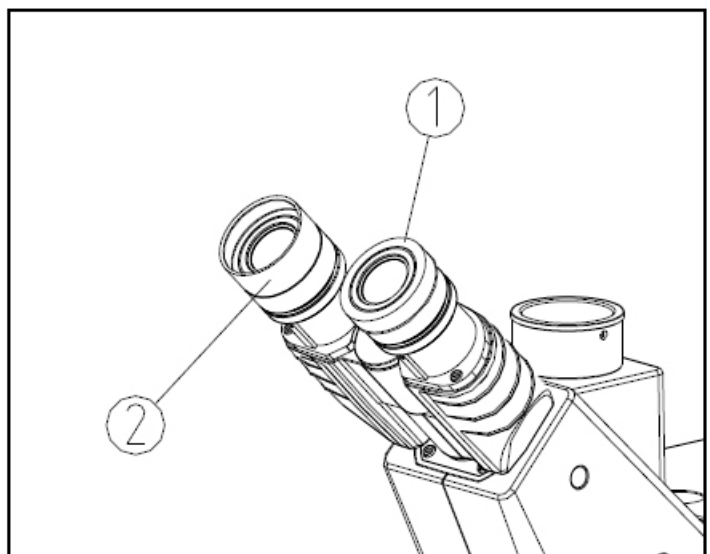
Adjust the interpupillary distance by holding both eyetubes and rotating them inward or out. The eyetubes are adjustable from 50~75mm. Once the interpupillary distance is set, note the dot (1) and the number on the scale (2). This is the interpupillary distance setting for your eyes. If the microscope is used by many people, remember this number.

The hinge on the eyetubes can be rotated 360° so the eyepieces can be set high or low.



## EYESHIELDS:

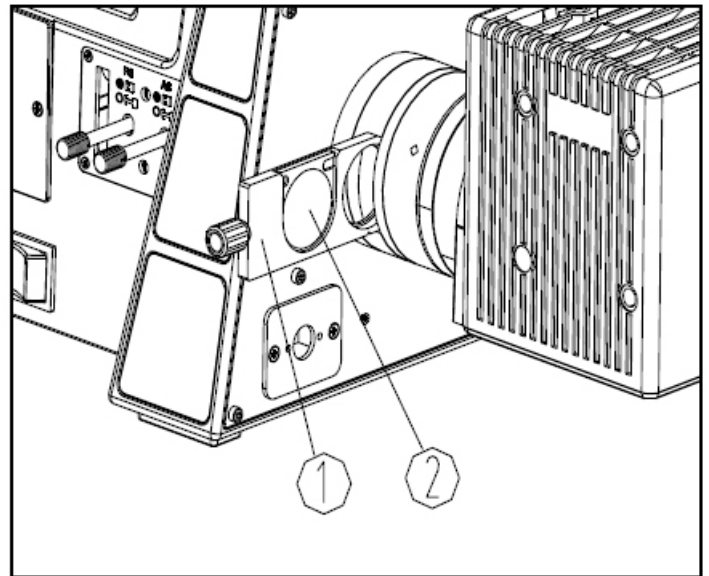
The eyeshield can prevent users who wear glasses from touching the eyepiece and damaging either the eyepiece of the glasses. Open the eyeshield (2) to prevent stray light from disturbing observation.



## COLOR FILTERS:



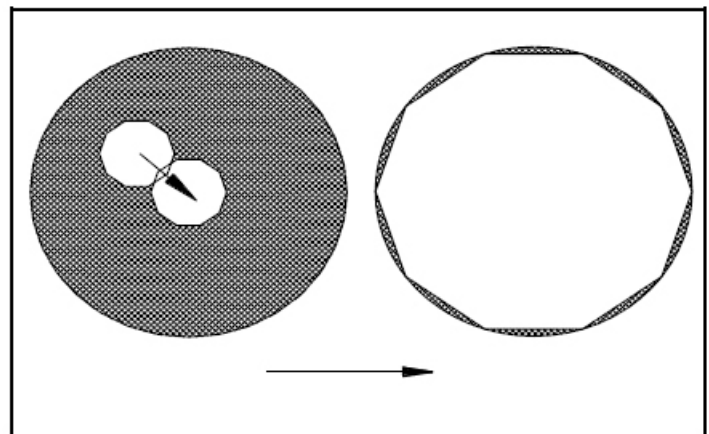
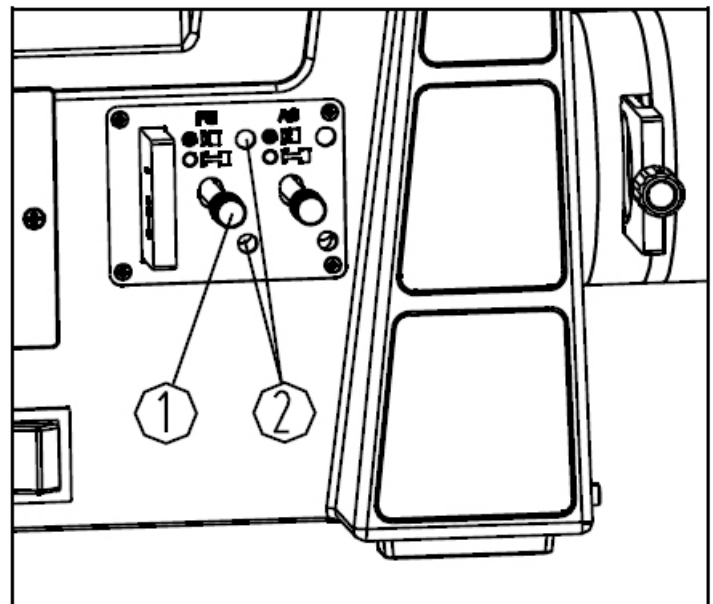
The color filter can strengthen image contrast. Pull the color filter slider (1) to the left or right and insert the filter (2) into the slot, then slide the slider into the light path. There are 4 types of filter options: blue, green, yellow, and LBD.



## FIELD DIAPHRAGM:

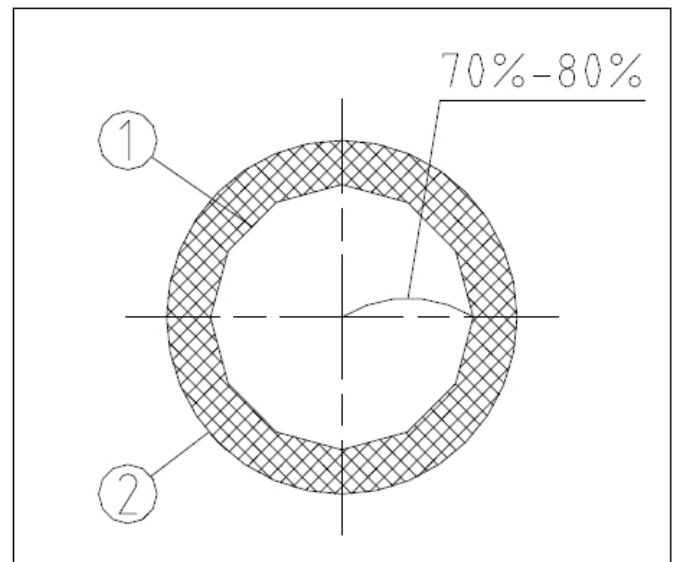
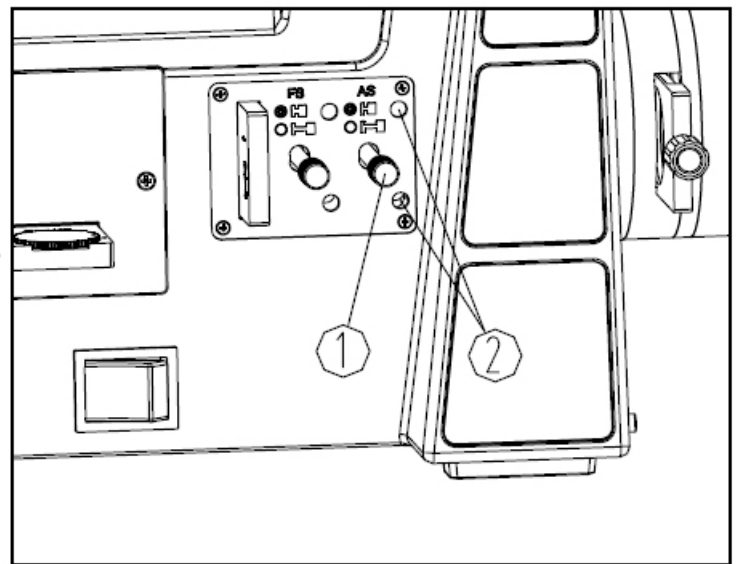


By limiting the diameter of the light entering the condenser, the field diaphragm can improve image contrast. When the image is right on the edge of the field of view, the objective lens will obtain the clearest image. Pull the field diaphragm adjustment lever (1) out all the way to minimize the field diaphragm. You will be able to see it when looking through the eyepieces. Adjust the two field diaphragm centering screws (2) until the image is in the center. (See example at right). Open the field diaphragm gradually until the image is inscribed in the center of the field of view and the diaphragm is just outside the edge of the image.



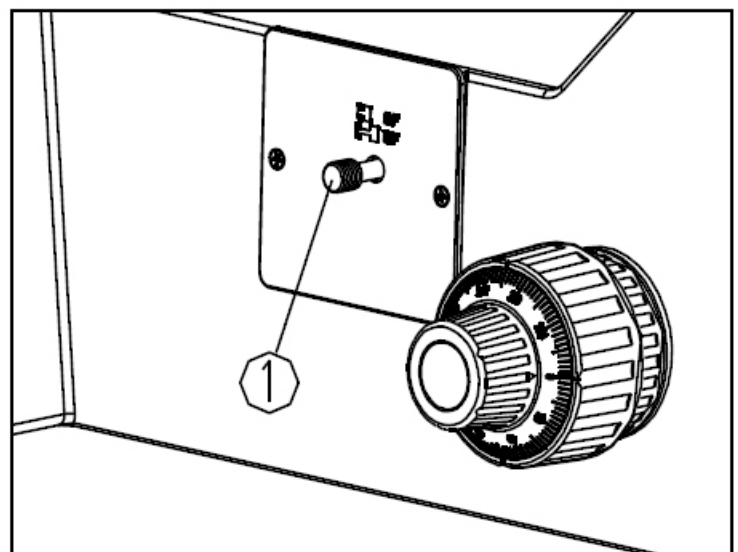
## APERTURE DIAPHRAGM:

The aperture diaphragm decides the numerical aperture (N.A.) of the illumination system. If the N.A. of the illumination system matches the N.A. of the objective, the depth of field is increased and resolution and contrast are improved. The aperture diaphragm (1) is adjusted similar to the field diaphragm. Adjust the centering screws (2) to move the image of the aperture diaphragm into the center of the aperture. If necessary, remove the eyepiece from the eyetube to see the aperture diaphragm better. Adjust the aperture diaphragm lever (1) until the image shown at right is obtained, where (1) is the aperture diaphragm and (2) is the edge of the objective.



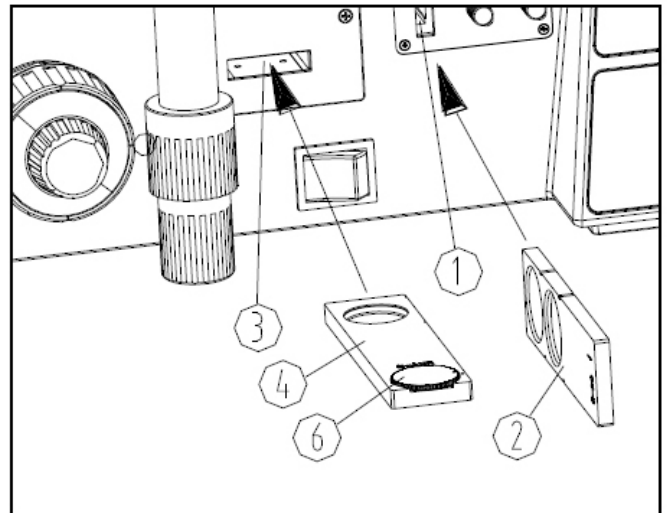
## BRIGHTFIELD / DARKFIELD:

Switch from brightfield (BF) to darkfield (DF) observation by adjusting the lever (1). When the lever is pushed in, brightfield is engaged, when the lever is pulled out darkfield is engaged. In darkfield observation, open the aperture diaphragm and field diaphragm all the way.

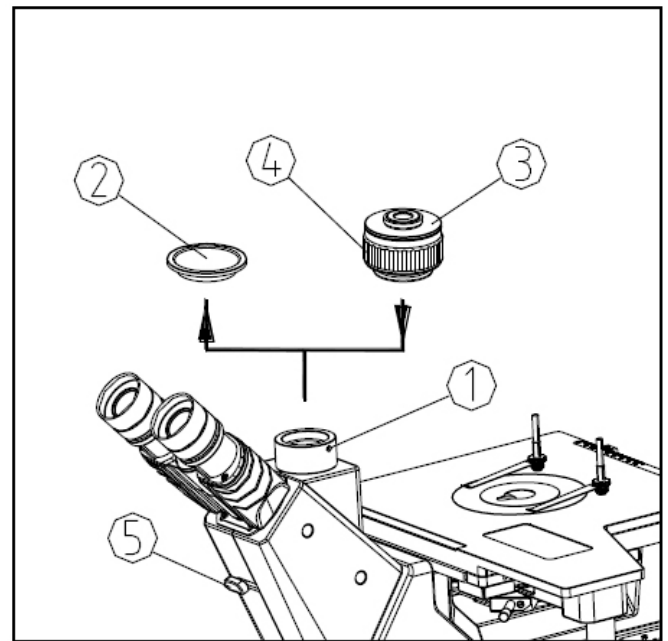


# Mi50 Inverted Microscope Operation Instructions

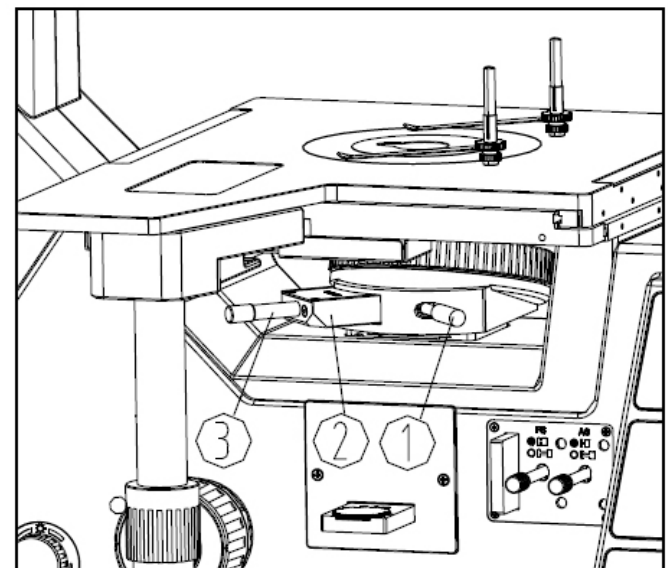
Polarization uses a polarizer and analyzer. Remove the dust cover (1) and insert the polarizer (2) as shown. The polarizer will click into place. Remove the color filter when using the polarizer. Remove the dust cover (3) from the analyzer socket and insert the 360° rotating analyzer (4) face up as shown. The polarizer and analyzer are orthogonal when the 360° rotating analyzer is zero adjusted. Rotating the dial (6) on the analyzer can change the orthogonal state of the polarized light.



Loosen the set screw (1) on the trinocular port and remove the dust cap (2). Remove the dust covers from the c-mount and screw the camera onto the c-mount threads (3). Insert the c-mount on the trinocular port and re-tighten the set screw. Look through the eyepieces to ensure a clear image, then engage the beam splitter (5) to direct light to the camera. If the image is not clear, adjust the c-mount focusing (4) until the image is clear.



In brightfield, adjust the focusing using a 10x or 20x objective to make sure the image is clear. Push the polarizer and analyzer into the light path to ensure both are orthogonal - or that the field of view is darkest. Loosen the locking screw (1) on the nosepiece, remove the dust cap and insert the DIC slider (2) fully and re-tighten the locking screw. Rotate the DIC fine adjustment knob (3) to unify interference colors in the field of view. Adjust the aperture diaphragm at the same time for best contrast.



# Mi50 Inverted Microscope Trouble Shooting

TROUBLE	POSSIBLE CAUSE	SOLUTION
Bulb is on but field of view is dark.	Field diaphragm is not open enough.	Adjust field diaphragm.
	Rheostat is too low.	Adjust rheostat control.
	Polarizer & analyzer are being used.	Remove polarizer and analyzer sliders.
Side of field of view is dark or uneven.	Nosepiece is not in position.	Rotate nosepiece.
	Dust on objective or eyepiece.	Clean lenses.
	Color filter, polarizer or analyzer are not in correct position.	Insert or remove filters or polarizer or analyzer.
	Beam splitter is not in correct position.	Adjust beam splitter.
Stain or dust in field of view.	Stains on specimen.	Clean specimen.
	Lenses are dirty.	Clean lenses.
Image is unclear.	Cover glass on specimen.	Do not use cover glass.
	Specimen is not vertical to objective lens.	Adjust specimen.
	Nosepiece is not in the correct position.	Adjust nosepiece.
	Aperture diaphragm is not open properly.	Adjust aperture diaphragm.
	Dust on eyepiece or objective.	Clean lenses.
	Beam splitter is not in correct position.	Adjust beam splitter.
One side of image is dark and the image moves while focusing.	Specimen is not placed on the stage properly.	Reposition specimen.
	Nosepiece is not in correct position.	Adjust nosepiece.
Eyes tire easily and right field of view doesn't impose with left.	Interpupillary distance is not set.	Adjust interpupillary distance.
	Diopter adjustment is not set.	Adjust diopter.
	Eyepieces in left and right eyetubes are different.	Use the same eyepieces.
Coarse focus knob is too tight.	Tension adjustment knob is too tight.	Loosen tension adjustment.
Stage falls.	Tension adjustment knob is too loose.	Tighten tension adjustment.

## Mi50 Inverted Microscope Trouble Shooting

TROUBLE	POSSIBLE CAUSE	SOLUTION
Bulb does not work.	No power supply.	Check power cord, plug in.
	Bulb is not installed properly.	Install bulb correctly.
	Bulb burned out.	Replace bulb.
Bulb burns out quickly.	Incorrect bulb is being used.	Replace bulb with 12v, 100w halogen bulb.
Field of view is not bright enough.	Incorrect bulb is being used.	Replace bulb with 12v, 100w halogen bulb.
	Rheostat knob is set too low.	Adjust rheostat.
Bulb flickers or light is not stable.	The bulb is about to burn out.	Replace bulb with a new one.
	The cable is not fully connected.	Check cable connections.

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