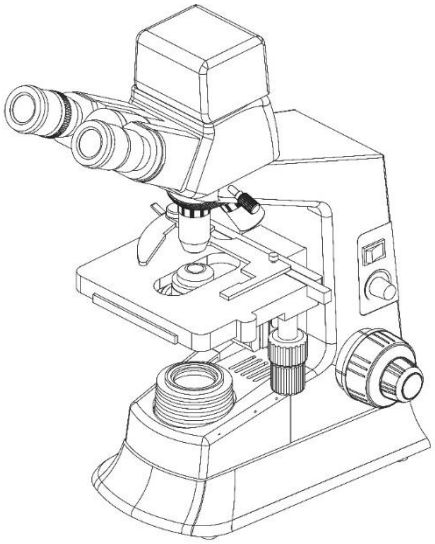
STEINDORFF®

Biological Microscope

NYMCS-237

Instruction Manual



This manual is written for biological microscope NYMCS-237 series. To ensure the safety, obtain optimum performance and to familiarize you fully with the use of this microscope, it is recommended strongly that you study this manual thoroughly before using the microscope and retain this manual in an easily accessible place near the work desk for future reference.

NEW YORK MICROSCOPE COMPANY INC.
AKA MEL SOBEL MICROSCOPES
100A Lauman Ln., Hicksville, N.Y. 11801 Toll Free: (877) 877-7274 • Fax: (516) 801-2046
Web Site: www.microscopeinternational.com • www.nyscopes.com • E-mail: Info@nyscopes.com

STEINDORFF®

USER NOTICE

I. Safety Notes

1. Carefully open the box, avoid the accessories, like lens, dropping to ground and being damaged.
2. Do keep the instrument out of direct sunlight, high temperature or humidity, dusty and easy shaking environment. Make sure the stage is smooth, horizontal and firm enough.
3. When moving the instrument, please use two hands to grip with the two sides of the microscope body.
4. During use, if the microscope is splashed by liquid, cut off the power at once, and wipe away the splash.
5. When running, the lamp house and nearby parts will be very hot. Please ensure there is enough cooling room for them.
6. Make sure the instrument is earthed, to avoid lighting strike.
7. For safety, be sure the main switch is in "O" (off) state before replacing the halogen lamp or the fuse, then cut off the power, and do the operation after the lamp bulb and the lamp house completely cool down. **(Specified: Halogen Lamp 6v 20w or LED 3w)**
8. Check the input voltage: be sure the input voltage which signed in the back of the microscope is consistent with the power supply voltage, or it will bring a serious damage to the instrument.
9.  - Warning against high temperature.
10.  - Warning against electric shock.
11.  - Warning: before use, carefully read the manual .improper use could result in personal injury to the user and/or damage to the equipment

II. Maintenance

1. All the lenses have been well checked and adjusted. It is forbidden to disassemble them yourself.
2. The nosepiece and coarse/fine focus unit have a compact and precise frame, so please don't disassemble them as possibly as you can.
3. Keep the instrument clean, wipe dust regularly, and be attention to avoid contaminating the optical elements especially.
4. The contaminations on the prism, as finger mark and oil, could be gently wiped with a piece of soft cloth or tissue paper, gauze which has been immersed in pure alcohol or ether. **(Note that the alcohol and ether are highly flammable, do keep them away from the fire or potential sources of electrical sparks, and use them in a drafty room as possible as you can.)**

STEINDORFF®

5. Do not attempt to use organic solvents to clean the microscope components other than the glass components. To clean them, use a lint-free, soft cloth slightly moistened with a diluted neutral detergent.
6. When using, if the microscope is splashed by liquid, cut off the power at once, and wipe up the moisture.
7. Do not disassemble any parts of the microscope, which will affect the function or decline the performance of the microscope.
8. Place the instrument in a cool, dry position. When not using the microscope, keep it covered with a dust cover. Make sure the lamp socket is cool before covering the microscope.

STEINDORFF®

1. SPECIFICATIONS

1.1. Mechanical tube: 160mm

1.2. CF high-contrast objectives:

Magnification	Numerical Aperture (N.A.)	Thickness of coverslip (mm)	Focal length (mm)	Working distance (mm)	Type
4x	0.10	0.17	28.902	17.912	Dry
10x	0.25	0.17	16.6	5.6	Dry
40x	0.65	0.17	4.28	0.6	Dry
100x	1.25	0.17	1.82	0.14	Oil

1.3. Eyepieces:

Category	Magnification	Focal length (mm)	Field of view (mm)
Wide field eyepieces	10x	24.86	Φ20
Plan eyepieces	16x	15.58	Φ11

1.4. Total Magnification:

Eyepieces	10x	16x	10x	16x	10x	16x	10x	16x
Objectives	4x		10x		40x		100x	
Total Magnification	40x	64x	100x	160x	400x	640x	1000x	1600x

1.5. Conjugate Distance: 195mm

1.6. Compensation free binocular head: inclined at 30°

1.7. Double layers mechanical stage: 140mm x 140mm
Moving Range: 75mm x 50mm

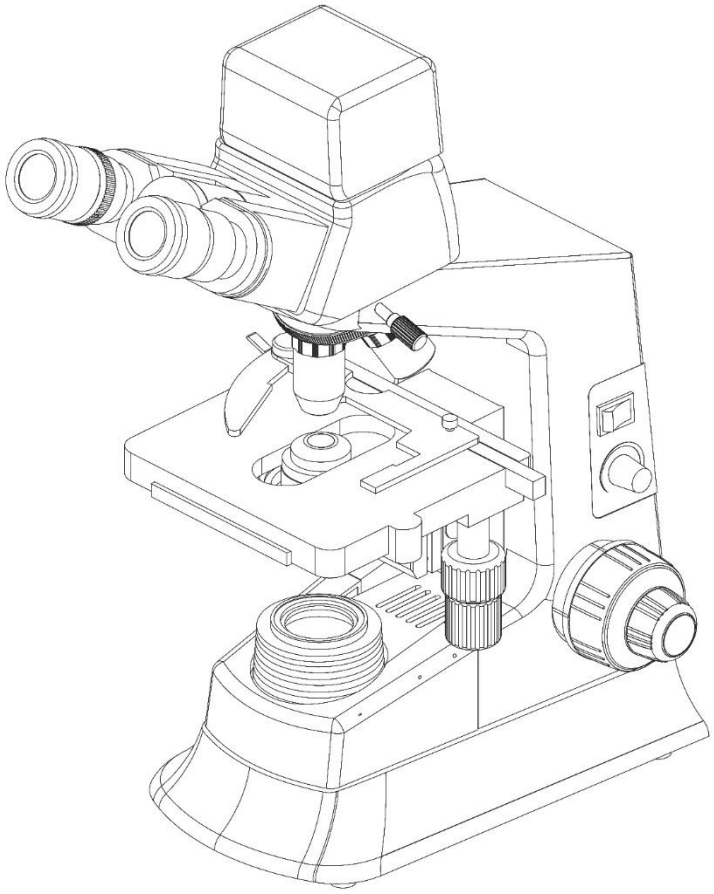
1.8. Coaxial coarse & fine focusing system, Adjustment Range: 20mm
Fine Division: 0.002mm

1.9. Condenser: N.A. = 1.25 Abbe condenser with iris Diaphragm, Adjustment Range: 20mm

1.10. Illumination system: halogen lamp 6v 20w or 3w LED, Brightness Adjustable, Voltage Rating: 110v or 220v

STEINDORFF®

2. MICROSCOPE FRAME



NYMCS-237 Digital Biological Microscope

Viewing head:

Compensation free binocular viewing head, inclined at 30°, interpupillary distance: 48-75mm.

Camera system:

External digital camera system with C-mount, 1.3M pixel CMOS image sensor.

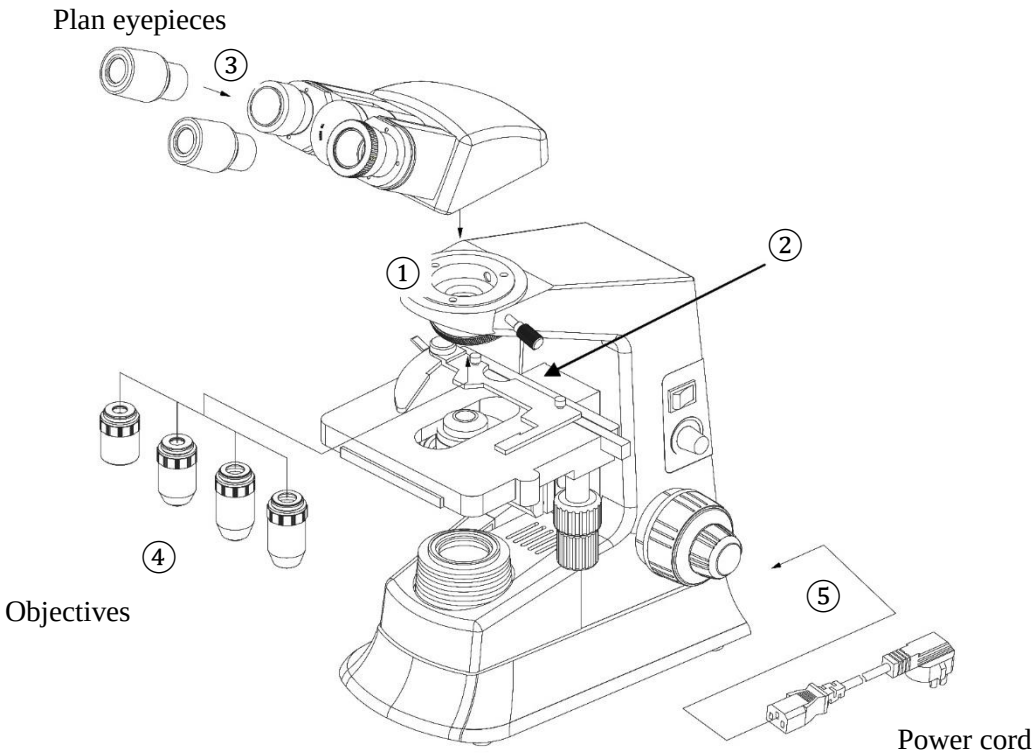
STEINDORFF®

3. ASSEMBLY

3.1. Assembly Diagram

The following figure shows the installation sequence of the components. The number in the figure shows the assembly steps.

- **Before installing, be sure every components is clean, do not scratch any parts or glass surface.**
- **Keep well with hexagon wrench provided. When replacing the components, you will need it again.**



STEINDORFF®

3.2. Assembly steps

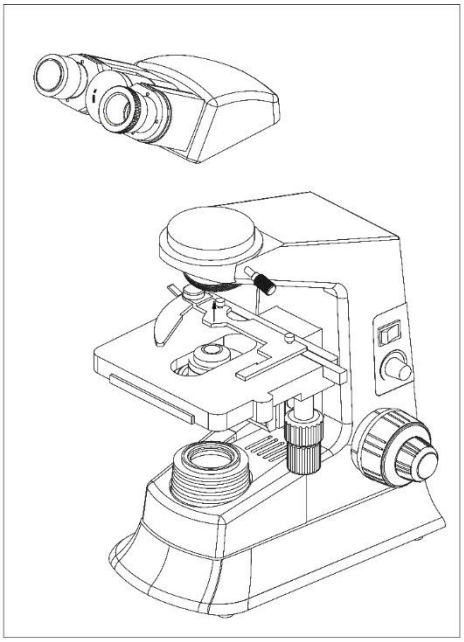


Fig. 1

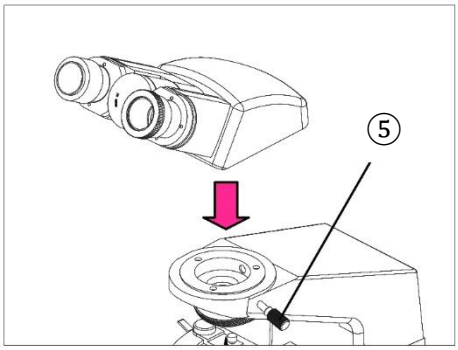


Fig. 2

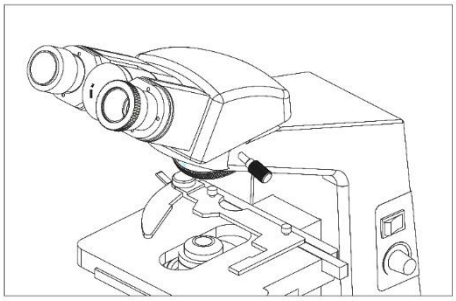
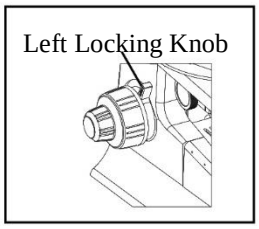


Fig. 3

3.2.1.Preparation (Fig. 1)

For protecting the microscope in shipping, we took some protect measures, so you need to finish the things listed below before installation: ① move away the plastic cap on the binocular viewing head; ② move away the plastic cap on the microscope body; ③ move away the plastic envelop of the stage; ④ revolve the adjustment knob upwards (firstly, please revolve the leftward knob up to loosen), remove the fixed block which used to prevent the stage slipping.



3.2.2.Installing binocular viewing head (Fig. 2, Fig. 3)

Insert the compensation free binocular head into the microscope body, turn into the right position, then screw down the bolt ⑤ to fix it.

Note:

Operation Conditions:

1. Temperature ：0° C～40° C, Maximum Relative Humidity: 85%.
2. High Temperature: High Temperature and humidity will result in a mildewing, dew and even ruinous instrument.
3. Avoid placing the instrument in a dusty environment. When ending your microscope operation, please cover it with the dust cap.
4. Lay the microscope in a plan and stable position, please.

STEINDORFF®

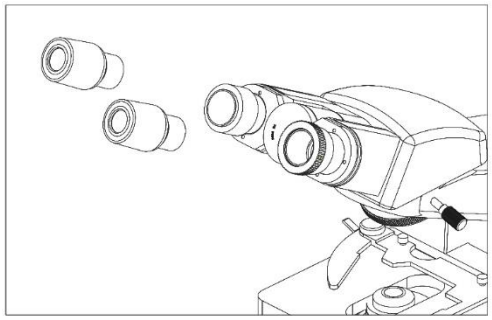


Fig. 4

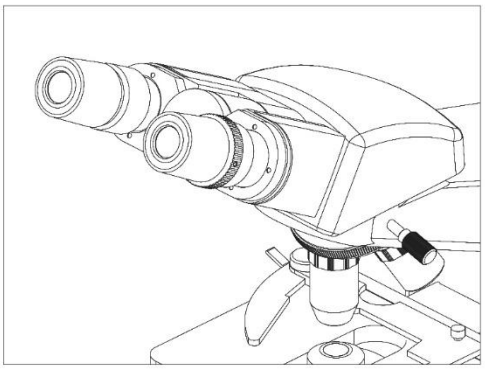


Fig. 5

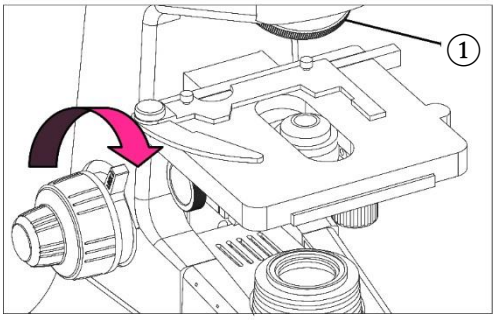


Fig. 6

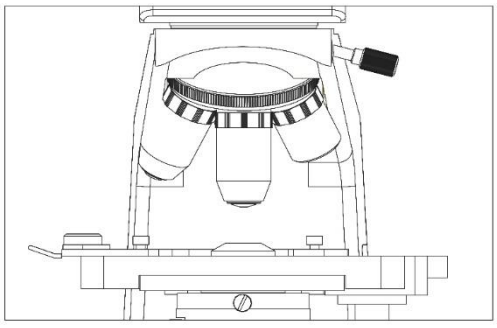


Fig. 7

3.2.3. Installing the eyepieces (Fig. 4, Fig. 5)

Insert the eyepieces into the eyepiece tube until they are against each other as shown in Fig. 5.

3.2.4. Installing objectives (Fig. 6, Fig. 7)

1. Adjusting the coarse focus knob until the support device of the mechanical stage reaches its low limit position.
2. Screw the lowest magnification objective into the nosepiece ① from the left or right side, then revolve the nosepiece clockwise and mount the other objectives in sequence of low to high magnification.

- **Clean the objectives regularly, for lens is susceptible to dust.**
- **When operating, use the 10x objective to search and focus on the specimen, then replace with higher magnification if necessary.**
- **Turn the objective until hear a “click” sound, indicating the objective is in the required position – center of light path.**

STEINDORFF®

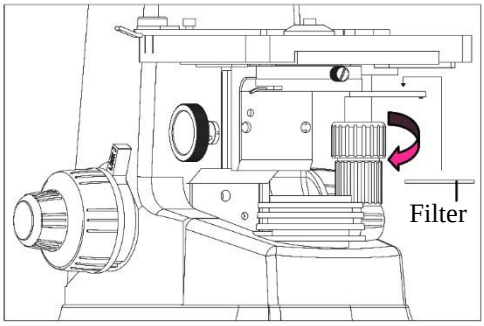


Fig. 8

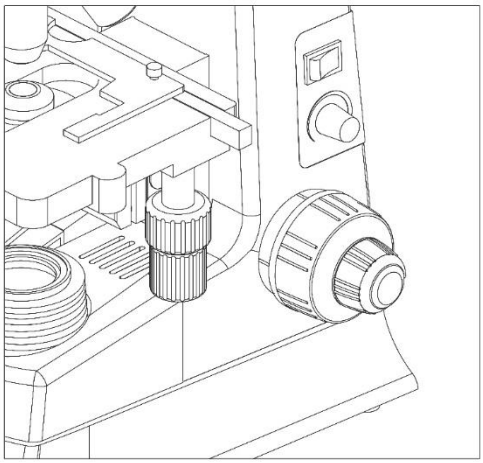


Fig. 9

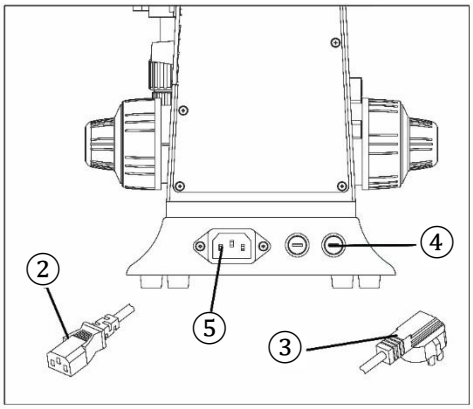


Fig. 10

3.2.5.Installing the color filters (Fig. 8)

1. Pressing the salient point under the condenser bracket, turn the condenser bracket ① out at the direction of arrow in Fig. 8
2. Put the required filters into the holder on the bracket, and then turn the bracket back to the right position.

❖ Baby blue and green filters are available in standard outfit.

3.2.6.Connecting the power cord (Fig. 9, Fig. 10)

1. Turn the main switch ① to "O" (off) state before connecting the power cord.
2. Insert the power plugs ② into the power jack ⑤ of the microscope; Make sure the connection is well.
3. Plug the power cord ③ into the power supply receptacle safely. Make sure the connection is well.

❖ **Make sure to check the input voltage, see whether or not it is the same as the nameplate indicates. Using the wrong input voltage would result in a short circuit or fire, and destroy the instrument.**

❖ **Use the supplied power cord at all times. If lost or damaged, please select the same standard power cord.**

3.2.7.Replacing the fuse (Fig. 9, Fig. 10)

Remember to turn the main switch ① to "O" (off) before replacing the fuse, and unplug the power cord. Rotate the fuse kit ④ out of the holder by the "–" type screwdriver, replace the fuse and reinsert the holder.

❖ **This instrument has two fuses, the rating is: 250V, 500mA**

STEINDORFF®

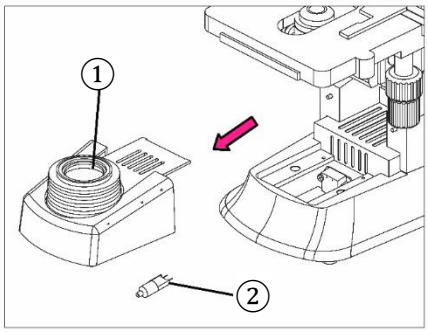


Fig. 11

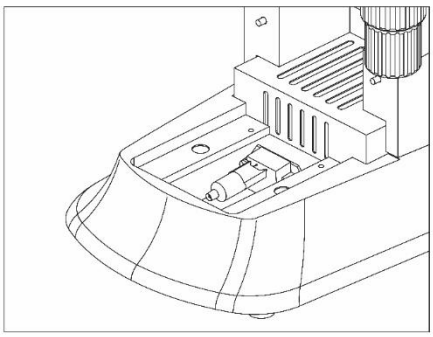


Fig. 12

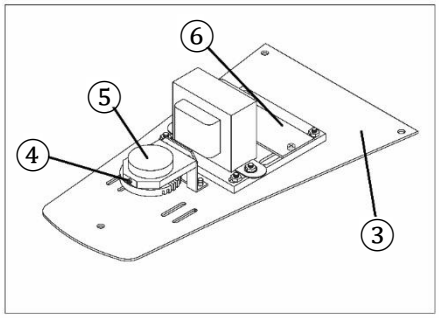


Fig. 13

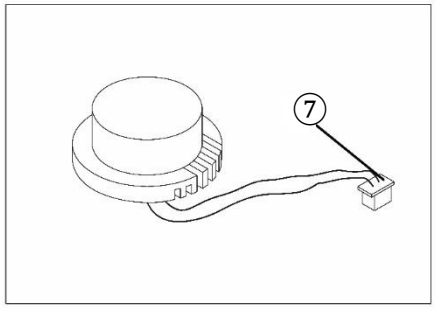


Fig. 14

3.2.8. Replacing the Lamp (Fig. 11, Fig. 12)

1. Please set the main switch to "O" state (off) before replacing, and make sure the bulb, the lamp room and periphery are all cool enough to carry no burn. Then, you can do your replacing.
2. Take up the collector holder ① lightly, pull it out by the direction which the figure shown.
3. Pull out the old bulb ②, hold the new bulb after you wrap it with gauze or other protection materials and insert its pin as deeply as possible into the jack in the lamp holder.
4. Insert the condenser holder back to the microscope body, pushing down to make sure the holder is holed stable enough.

- **Please insert the bulb gently, or it will be damaged by excessive extrusion.**
- **Do not touch the halogen bulb with bare hands. It will shorten the service life or cause it to burst. If you leave fingerprints on the surface carelessly, clean it with a piece of dry soft cloth.**

When replacing LED:

1. Generally, the LED has a long service life and is not easily damaged. If damaged, purchase a new one from your supplier. (Fig. 14)
2. Remove the base plate ③ from the bottom of the microscope with screw driver, remove screw ④ to take off the old LED, pull out the other end of LED wire from the breadboard ⑥, and replace with the new LED.
3. Put the new LED unit back onto the bracket with the screw ④ and insert the end of the LED wire onto the breadboard ⑥.
4. Install the base plate ③ back onto the bottom of the microscope with original screws.

- **When removing the base plate, please do so gently and slowly, to avoid damaging internal electrical wires.**

STEINDORFF®

4. ADJUSTMENT & OPERATION

4.1. Assembly Diagram

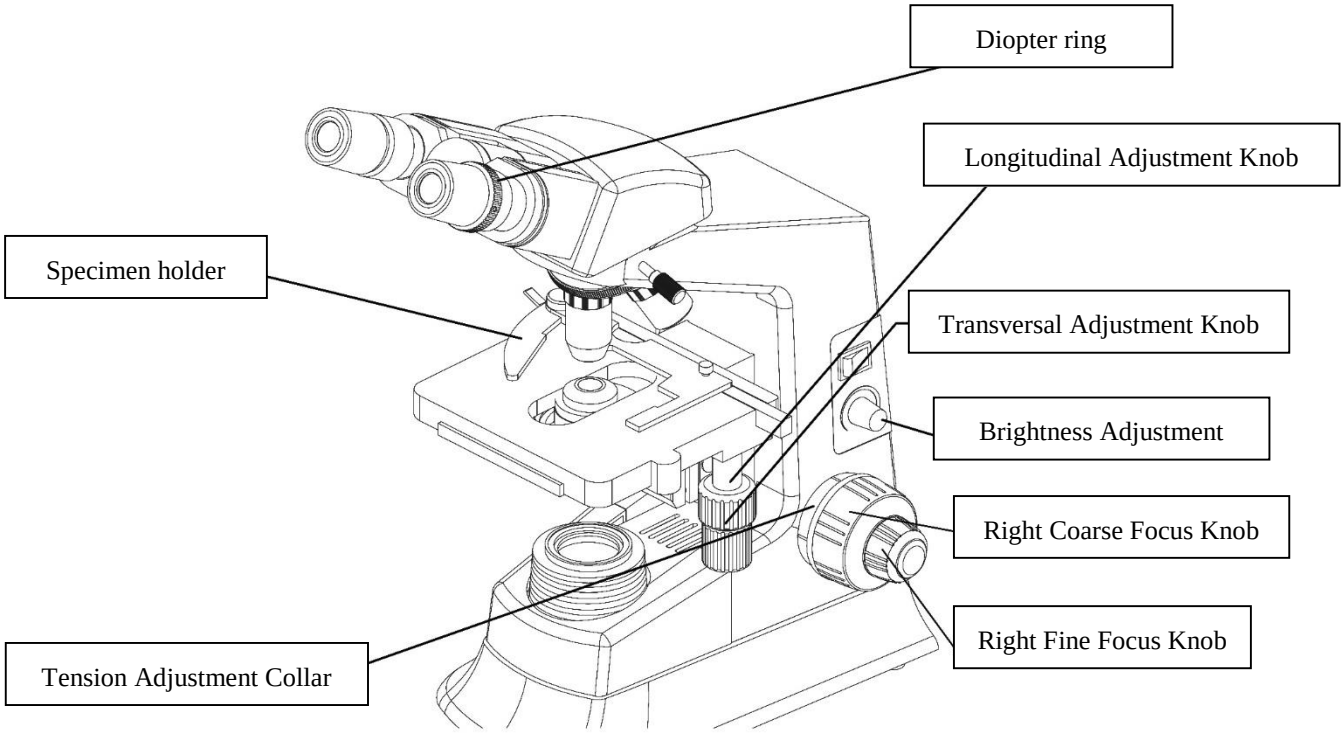


Fig. 15

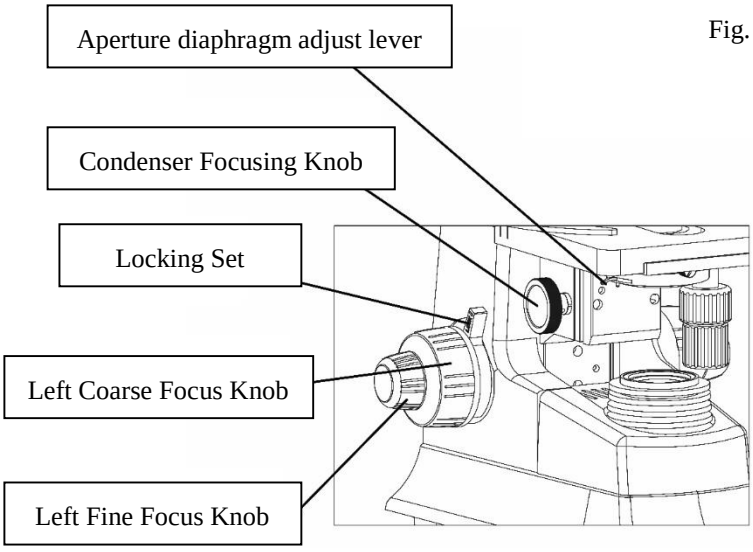


Fig. 16

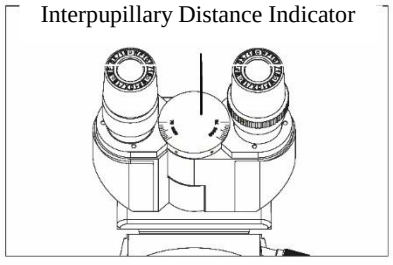


Fig. 17

STEINDORFF®

4.2. Operation

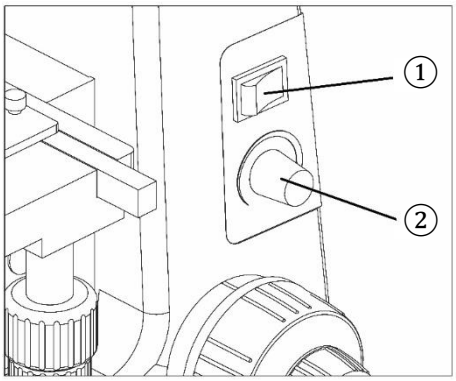


Fig. 18

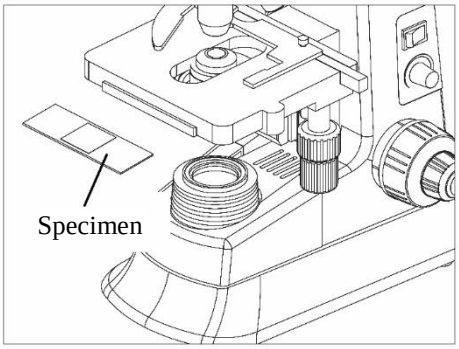


Fig. 19

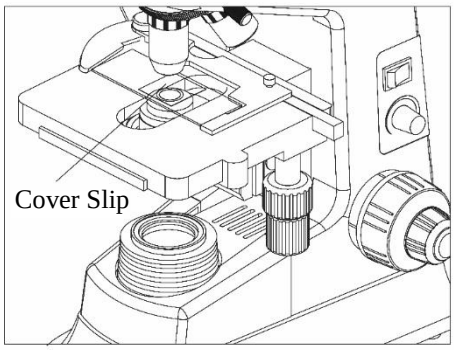


Fig. 20

4.2.1.Adjusting the brightness (Fig. 18)

1. Connect the power, turn on the main switch ① (shown on the figure) which on the bottom side of the base to "—" (on).
2. Turning the brightness adjustment knob ② clockwise, the voltage raise, and the brightness strengthen; whereas turning at the contra direction, the voltage decline, and the brightness weaken.

❖ **The brightness is affected by kinds conditions, like the phase contrast of the specimen, the magnification of the objective, the adjust ability of the eyes and so on. Too faint or too strong light is not suitable. So, generally you should not adjust the brightness to the highest intensity, or it will let the lamp working in a fully loaded state, and bring a shorten work life.**

4.2.2.Placing the specimen (Fig. 19, Fig. 20)

1. Place the specimen on the center of the stage, keeping the cover slip upward, and then nip it with the specimen holder.
2. Turn the longitudinal and transversal adjustment knobs which are on the mechanical ruler to move the specimen into the required position.

❖ **Be careful when changing the objective. If you finish observation with the short working distance objective, and want to change to another one, be careful not to let the objective touch the specimen.**

STEINDORFF®

4.2.3. Oil spacing observation

The objective labeled "Oil" is oil immersion objective (100x objective). When use the oil-spaced lens, you need to add special oil only used for microscope between the objective and the cover slip. You should be aware of the cleaning procedures to be used after the use of oil. Wipe oil from the oil immersion objective, and from any other parts in need of cleaning. Clean lenses immediately after use. Leaving oil on the lens may allow oil to seep behind and harden on the inside of the lens

- **Immersing the oil**
  Add oil between the objective and the specimen, note that not all kinds oil are suitable, it is a special one, just supplied for microscope. (Cedar oil Fig. 21)

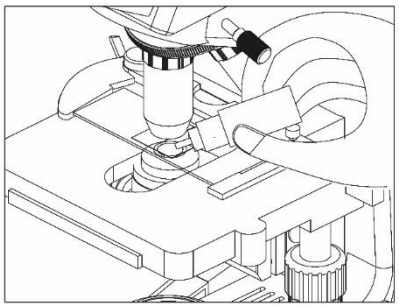


Fig. 21

- **Eliminating the bleb**
  The bleb in the oil will result in a bad effect on the image quality. So make sure there is no bleb when using the oil. You also can take the following steps to avoid this problem:
  - Turn the nosepiece gently to move the oil immersion objective several times.
  - Add more immersion oil
  - Wipe away the oil, and add some other oil for replacement

Note:
Only a little oil is needed. If too much, the residual oil will seep into the stage and the condenser and result in a decline of the performance.

4.2.4. Focus (Fig. 22)

Place the specimen on the center of the stage, make sure the cover slip is upward, then, uses the 10x objective and the 10x ocular to perform the observation.

To avoid the objective touching against the specimen, you should rise the mechanical stage up to make the specimen near to the objective at first, then apart them slowly to make focus.

When focusing, please reversely turn the coarse focus knob ①, let the specimen falling slowly, and look into the ocular to search image at the same time. And at last, change the fine focus knob ② to sharp the image. After done this, you could change other magnification objective freely with no risk of damaging the specimen.

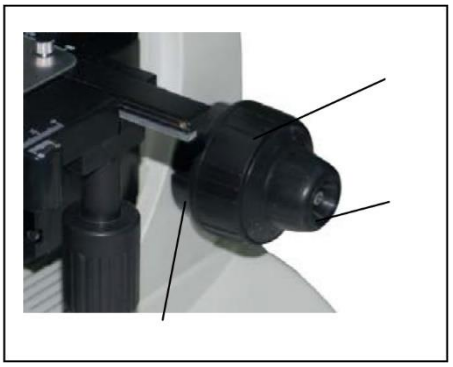


Fig. 22

STEINDORFF®

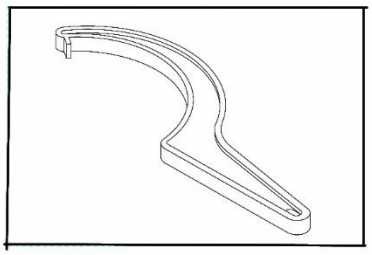


Fig. 23

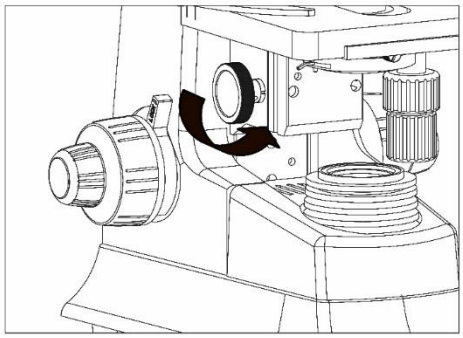


Fig. 24

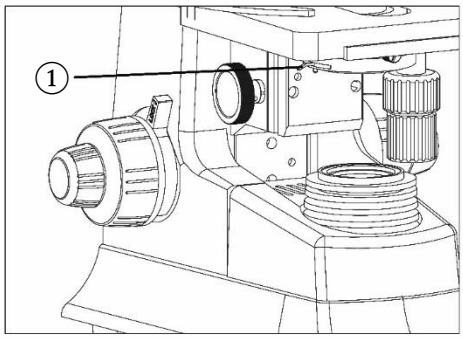


Fig. 25

- **The tight tension of the coarse focus knob has already been adjusted before leaving factory. If loosen (e.g. the stage slip down by its weight), please screw the intention adjustment collar ③ to the right position by the supplied spanner.**

4.2.5.Condenser Adjustment (Fig. 23)

Turn the condenser focus knob to move the condenser up and down. Raise the condenser when using the high magnification objective, and lower it when using the low magnification objective.

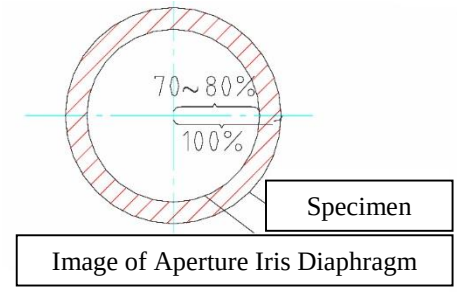
- **The condenser and the objective are coaxial. It has been adjusted well before leaving the factory, so the user nee not adjust them.**
- **The highest position of the condenser has also been adjusted. User adjustment is not needed.**

4.2.6.Aperture Iris Diaphragm Adjustment (Fig. 25)

Turn the aperture iris diaphragm lever ① to adjust the aperture iris diaphragm.

- **If the size of the aperture diaphragm minified, the brightness and resolution declined, while the contrast and depth of field increased; In other words, if the size is enlarged, the brightness and the resolution improves, but the contrast and depth of field declines.**
- **Generally, setting the size of the condenser aperture diaphragm at 70% ~ 80% of the numerical aperture, you can obtain a clear image with enough contrast. If the opening of the aperture diaphragm is too small, the resolution will be very low, please do not minify the aperture below 60% of the numerical aperture.**

STEINDORFF®



The right size of the aperture

Fig. 26

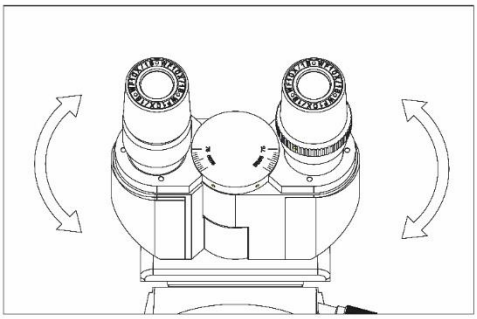


Fig. 27

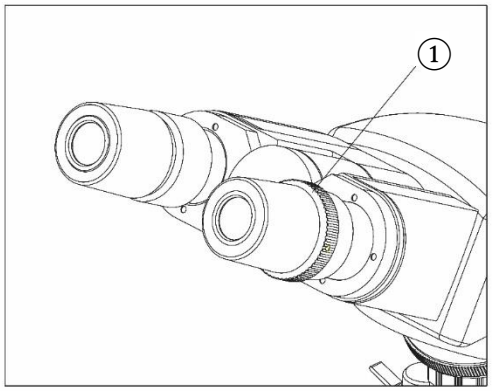


Fig. 28

- **The numerical aperture is marked on the objective. For example, the mark "10/0.25" means the magnification is 10x, and the numerical aperture is 0.25.**
- **If you want to observe the image of the aperture iris diaphragm, remove one eyepiece and look through the tube. You will see a dark circle encroaching on the bottom of the tube.**

4.2.7.Adjusting the Interpupillary Distance (Fig. 27)

Interpupillary distance range: 55mm ~ 75mm

When observing with two eyes, hold onto the left and right prism holders, turn then around the axis to adjust the interpupillary distance until the lift and right fields of view coincide completely, as shown in Fig. 27.

4.2.8.Adjusting the diopter (Fig. 28)

1. Look into the left ocular with your left eye, then revolving the coarse knob to focus on the specimen.
2. Then use the right eye to look into the right ocular. If the image is not sharp, use the diopter adjustment ring ① to adjust.

STEINDORFF®

5. OUTFIT

Components	Specifications		S-237
Main Body	Main body		●
	Double layers mechanical stage		●
	Condenser bracket		●
Viewing Head	Compensation Free Binocular Head, Inclined at 30°		●
	1.3M Pixel CCD Camera System		●
	USB Cable		●
Condenser	N=1.25 Abbe Condenser with iris diaphragm		●
Nosepiece	Quadruple		●
	Quintuple		○
Illumination System	3W LED		●
	Kohler illumination system		○
	Spare bulb (6v 20w halogen lamp)		○
	Spare fuse, with rating: 250mA (500mA for 110V)		●
Eyepieces	EW10x WF eyepieces		●
	WF16x WF eyepieces		○
Objectives	CF high-contrast objectives	4x	●
		10x	●
		40x	●
		100x	●
	Plan achromatic objectives	4x, 10x, 20x, 40x, 60x, 100x	○
Filters	Baby blue		●
	Green		●
Polarization Set	Simple Polarization Set		○
Phase Contrast Kit	Simple Phase Contrast Kit		○
	Sliding Phase Contrast Kit		○
	Turret Phase Contrast Kit		○
Dark Field Condenser	Dry dark field condenser NA 0.9		○
	Oil dark field condenser NA 1.25 - 1.36		○
Fluorescent attachment	Epi-fluorescent attachment		○
Pointer system	LED Optical Point System		○

Note: ● Standard, ○ Optional

STEINDORFF®

6. TROUBLESHOOTING

PROBLEMS	REASON FOR PROBLEMS	SOLUTION
I. Optical Parts		
The edge of the field of view has shadow or the brightness is asymmetry	The nosepiece is not in the located position	Adjust it into the located position
	The filament Imaging not in center	Adjusting it to center
	Stains on the lens (Condenser, Objective, Eyepiece)	Wipe up
Stains in View Field	Stains on the lens (Condenser, Objective, Eyepiece)	Wipe up
	Stains on the specimen	Wipe up
	The Condenser position is too low.	Loose the condenser locking bolt. Adjust the position of condenser. Screw down the locking bolt.
Low image quality (Low resolution, low contrast)	No cover slip on the specimen	Cover the slip
	The cover slip is too thick or too thin.	Use standard cover slip. Thickness: 0.17mm
	The specimen is reversed.	Reverse back.
	The dry objective is stained with oil (Especially 40X)	Wipe up
	Stains on the lens (Condenser, Objective, Eyepiece)	Wipe up
	The oil objective is not in oil.	Use oil
	There is air bubble in oil	Remove oil
	Not use the appointed oil	Use the appointed oil
	The opening of Aperture diaphragm is too large	Properly make it smaller
	Stains on the incidence lens in the binocular drawtube.	Wipe up
	The opening of Aperture diaphragm is too small	Properly make it larger
	Condenser position is too low	Adjust the position
One side of image is dark.	The condenser is not in center of the view field, or the condenser is inclined.	Reinstall the condenser and adjust the center carefully by using the condenser adjusting bolt.
	The nosepiece is not in the located position	Turn it into the required position
	The specimen is floating on the stage.	Reinforce it reliably.

STEINDORFF®

The image moved when focusing.	The specimen is floating on the stage.	Reinforce it reliably.
	The nosepiece is not in the located position	Turn it into the required position
The image takes the yellow slightly.	Not using the color filter.	Use the blue filter.
The bright degree is not enough	The opening of Aperture diaphragm is too small	Properly make it larger
	Condenser position is too low	Adjust the position
	Stains on the lens (Condenser, Objective, Eyepiece)	Wipe up
II. Mechanical Part		
Can't focus when use high magnification objective	Slice put reversed. Cover slice is too thick.	Reverse back. Use standard cover slice. Thickness: 0.17 mm
Touch the slice when switch the objective from low magnification to high one.	Slice put reversed. Cover slice is too thick.	Reverse back. Use standard cover slice. Thickness: 0.17 mm
The specimen move not flowing	The slice holder not nip the slice firmly.	Make it firmly
Two eyes image not in superposition	The interpupillar distance is not correct	Adjust the interpupillar distance correctly
The eyes are uncomfortable	The diopter is not right	Adjust the diopter according your sight
	The bright degree is not properly	Adjust the voltage of bulb.
III. Electric Part		
The lamp can't light	No power	Check the power cord, and connect them exactly
	The installation of the bulb is wrong	Install the bulb correctly
	The bulb burn out	Change the bulb
The bulb burn out in a high frequency	Not using appointed lamp. High voltage	Use an appointed lamp. If the circumstance still not change, please contact the maintenance part.
The rightness degree is not enough	Not using appointed lamp. Low voltage	Use an appointed lamp. Turn up the voltage
The light glimpse	The bulb is going to spoil	Change the bulb
	The power cord have a poor contact	Check the power cord, and connect them exactly