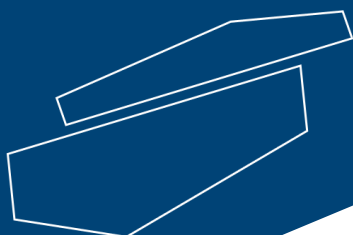




## HIGH-END BIOLOGICAL MICROSCOPE QUANTUM Pro

*Please read the User Manual carefully before use, and follow all operating and safety instructions!*



# user manual

english

# User Manual



## HIGH-END BIOLOGICAL MICROSCOPE QUANTUM Pro

### **Preface**

Thank you for purchasing our product. Users should read this manual carefully, follow the instructions and procedures, and be aware of all preventive measures when using this instrument.

### **Service**

If help is needed, you can always contact your dealer or Labbox via [www.labbox.com](http://www.labbox.com).

Please provide the customer service representative with the following information:

- Serial number
- Description of the problem
- Your contact information

### **Warranty**

This instrument is guaranteed to be free from defects in materials and workmanship under normal use and service for a period of 24 months from the date of invoice. The warranty is extended only to the original purchaser and shall not apply to any product or parts that have been damaged due to improper installation, improper connections, misuse, accidents, or abnormal conditions of operation.

For claims under the warranty, please contact your supplier.

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## **User Notice**

### **1. Safety Note**

1. Open the box carefully to avoid the accessories, like lens, dropping to ground or 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 flat, horizontal and firm enough.
3. When moving the microscope, carefully carry it with the handle and the base.
4. When running, the lamp house and nearby parts will be very hot. Please ensure there is enough cooling room for them.
5. Make sure the instrument is earthed, to avoid lighting strike.
6. For safety, be sure the main switch is in "O" (off) state and cut off the power supply before replacing the bulb or the fuse. If you replace the bulb during use or right after use, allow the lamp bulb and the lamp house to cool completely before touching.

(Designated bulb : 3W LED, which is used with the electricity source since it cannot be charged)

7. Check the input voltage and be sure the input voltage (which is signed in the back of the microscope) is consistent with the power supply voltage, or it will bring a serious damage to the instrument.
8. Always use the power cord provided by us.

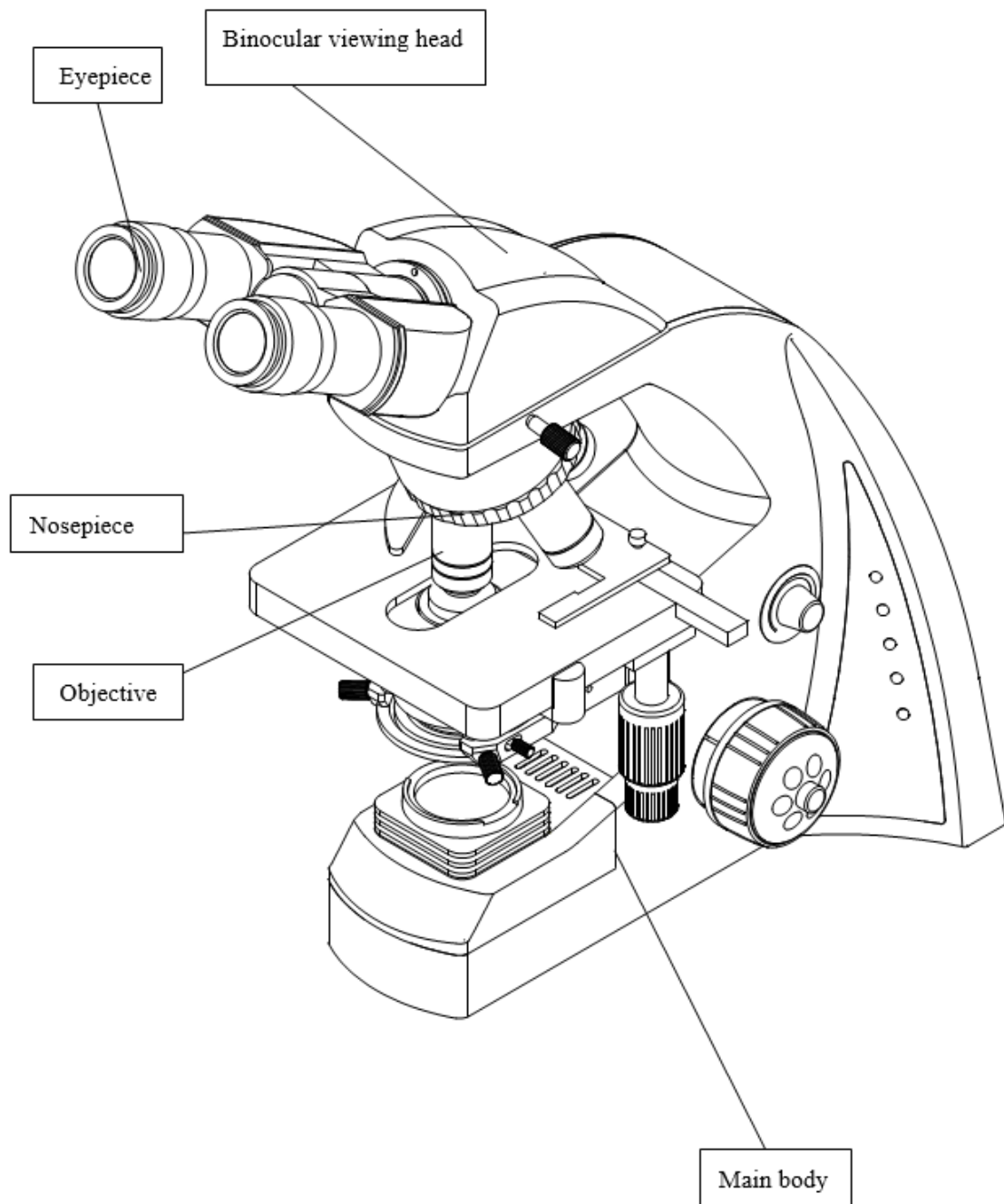
### **2. Maintenance and Care**

1. All the lenses have been adjusted properly; do not dismount them by yourself please.
2. The nosepiece and coarse and fine focusing parts are so delicate that it is forbidden to disassemble them carelessly by yourself.
3. Keep the instrument clean, and do not pollute the optical element when wiping away the dust on the instrument.
4. The contaminations on the prism, like fingerprints and oil smudges, 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.)*

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 away the splash.
7. Do not disassemble any parts of the microscope, as this will affect the function or reduce 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.

## 1. Components' Name

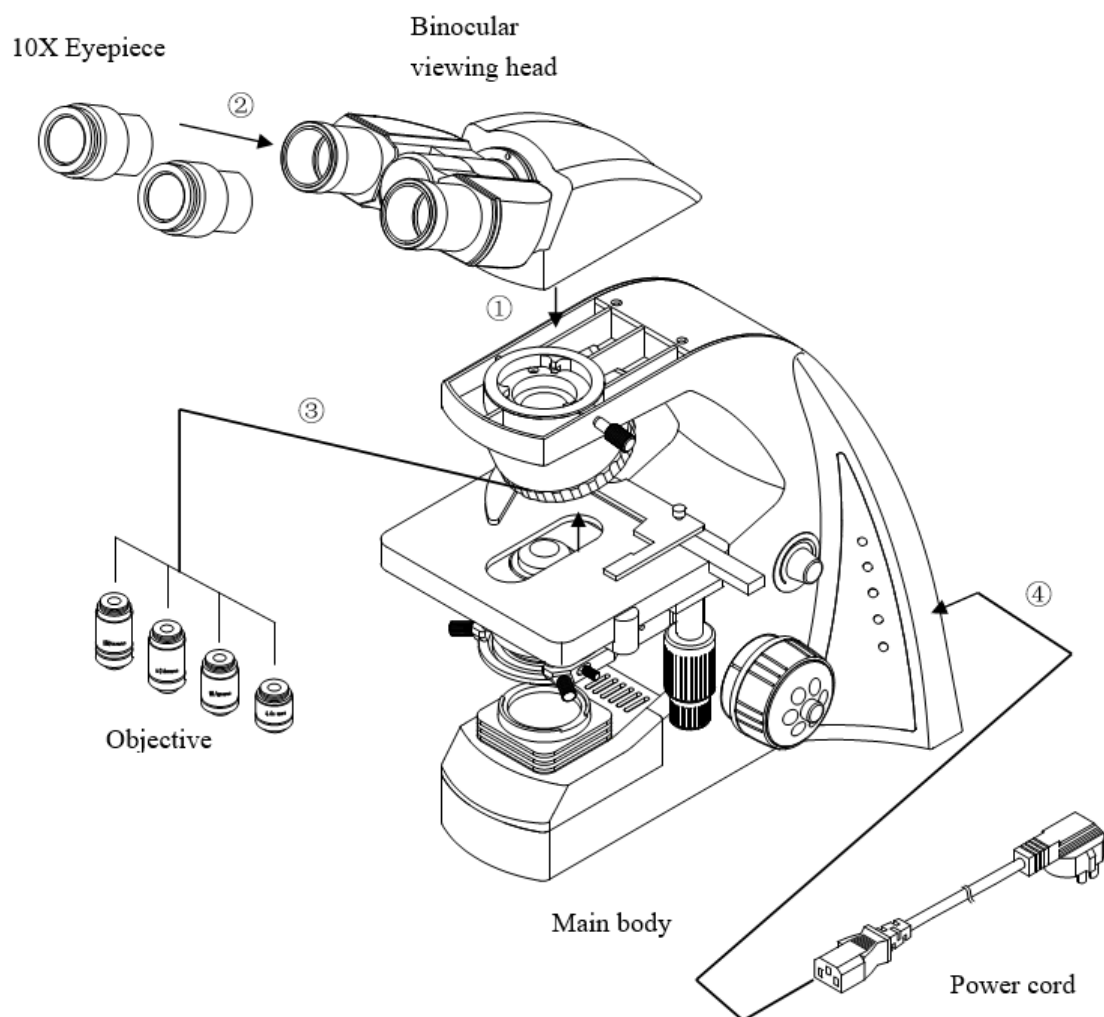


## 2. Assembly

### 2.1 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 component is clean, do not score any parts or glass surface.
- ★ Keep well with hexagon wrench provided. When changing the components, you will need it again.



### 2.2 Assembly Procedure

#### 2.2.1 Installing binocular viewing head (Fig. 1-2)

Insert the binocular viewing head into the microscope head and turn it to a proper position, then screw down the bolt to fix it.

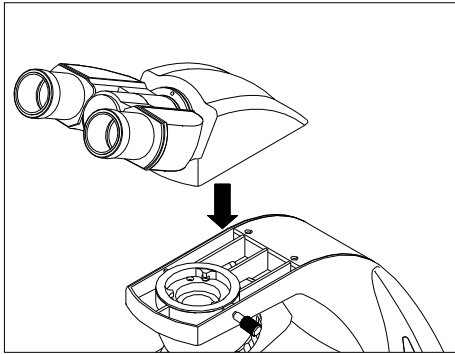


Fig. 1

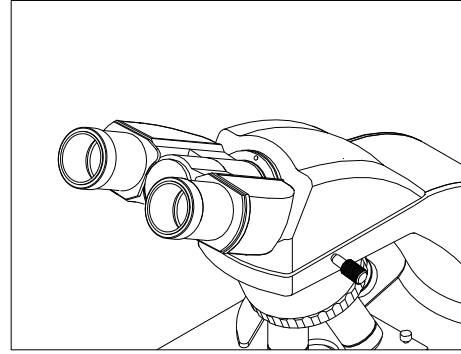


Fig. 2

### 2.2.2 Installing the eyepiece (Fig. 3-4)

Insert the eyepiece into the eyepiece tube until they are against each other, as shown in Fig.4.

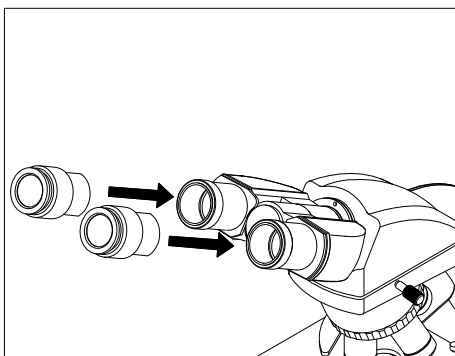


Fig. 3

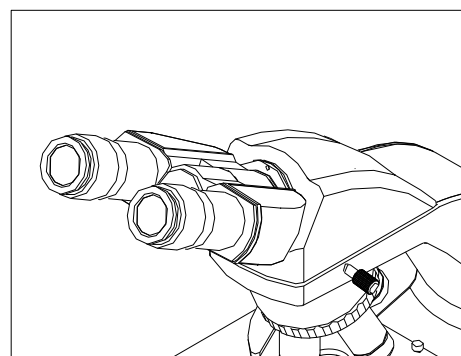


Fig. 4

### 2.2.3 Installing the objective (Fig.5-6)

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 from the left or the right side, then revolve the nosepiece clockwise and mount other objectives by the sequence of low to high magnification

✧ Installing objective this way will make the change of magnification to be easier during using.

★ Clean the objective regularly, for lens is susceptible to dust.

★ When operating, use 10×magnification objective to search and focus specimen firstly, then replace with higher magnification objective if necessary.

★ When replacing the objective, slowly turn the nosepiece until you hear “clicked”, that means the objective is in place.

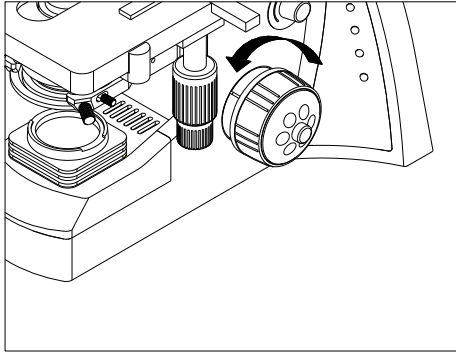


Fig. 5

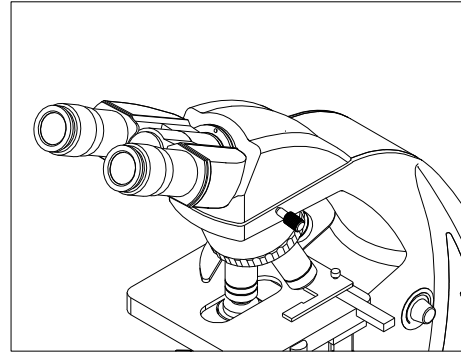


Fig. 6

#### 2.2.4 Mounting the filters (Fig.7)

1. Place the required filter in front of the condenser.

★ The filter of the standard outfit is green and baby blue.

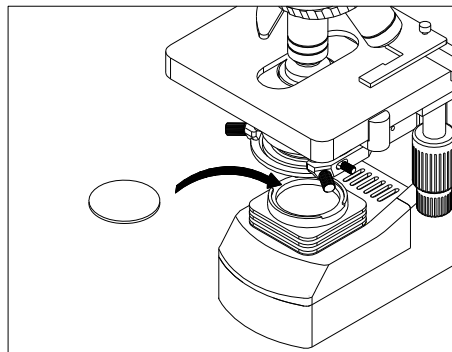


Fig. 7

#### 2.2.5 Connecting the Power Cord (Fig.8-10)

★ The cable and cords are vulnerable when bent or twisted, never subject the power cord to excessive force.

1. Set the main switch ① to "O" (off) state before connecting the power cord.
2. Insert the plugs ② into the power jack ③ of the microscope safely.
3. Plug the power cord ④ into the power supply receptacle ⑤. Make sure the connection is well.

★ Do use the supplied power cord all the time. If lost or damaged, select the same

standard cord, please.

★ A wide range of voltage, like 100V~240V, is acceptable for this microscope.

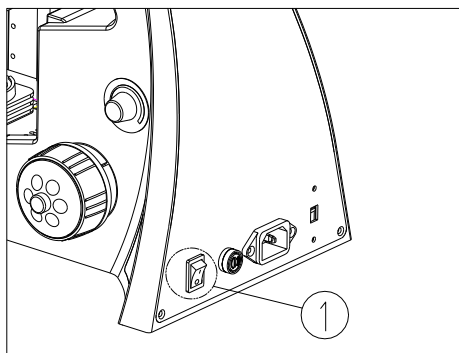


Fig. 8

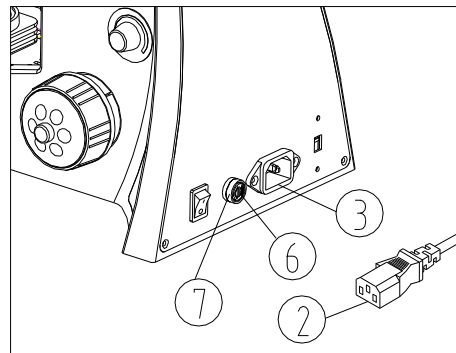


Fig. 9

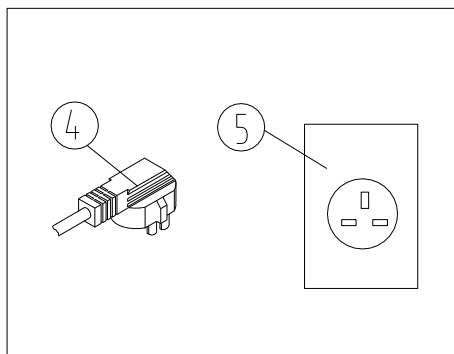


Fig. 10

### 2.2.6 Replacing the fuse (Fig.8-10)

Do remember to set the main switch① to the state “O” (OFF) and unplug the power cord before replacing the fuse. Rotate the fuse⑥ out of the holder⑦ with the “--” type screwdriver, replace with a new fuse, then rotate it back to the holder again.

### 2.2.7 Installing and Replacing the bulb (Fig.11-13)

✧ Please use the specified halogen Lamp 6V20W.

1. Pull out the condenser holder as shown in Fig.11.
2. Hold the bulb① after you wrap it with gauze or other protection materials and then insert its pin② deeply into the jack in the lamp holder.

3. During microscope using or soon after it is turned off, the bulb, the lamp house and nearby parts will be very hot and will cause serious burns. Please turn the main switch to “O” (off) and disconnect the power plug, and make sure the bulb, the lamp room and periphery are all cool. Then, you can do your replacing.

★ Insert the bulb gently. Squeezing too hard will damage the bulb.

★ To prevent reduced bulb life or cracking, do not touch the bulb with bare hands. If

fingerprints are accidentally left on the bulb, wipe the bulb with a soft cloth.

4. Place the condenser holder back and press fit.

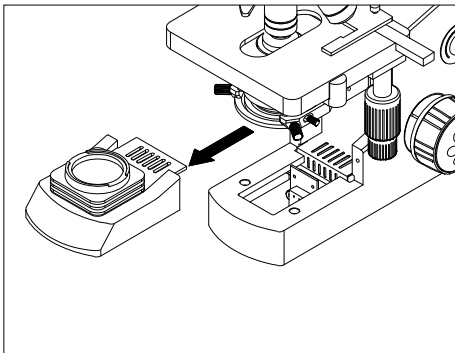


Fig. 11

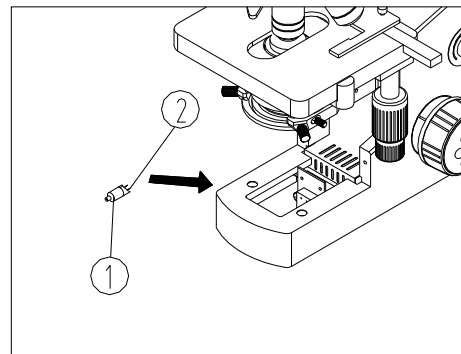


Fig. 12

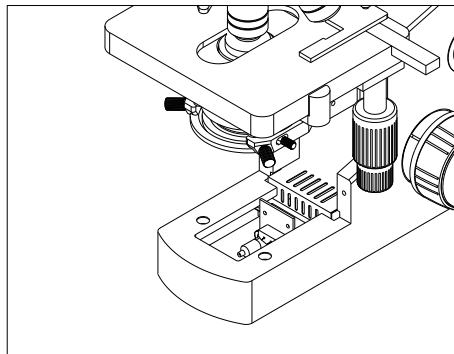


Fig. 13

### 3. Adjustment and operation

#### 3.1 Adjustment set diagram (Fig.14-15)

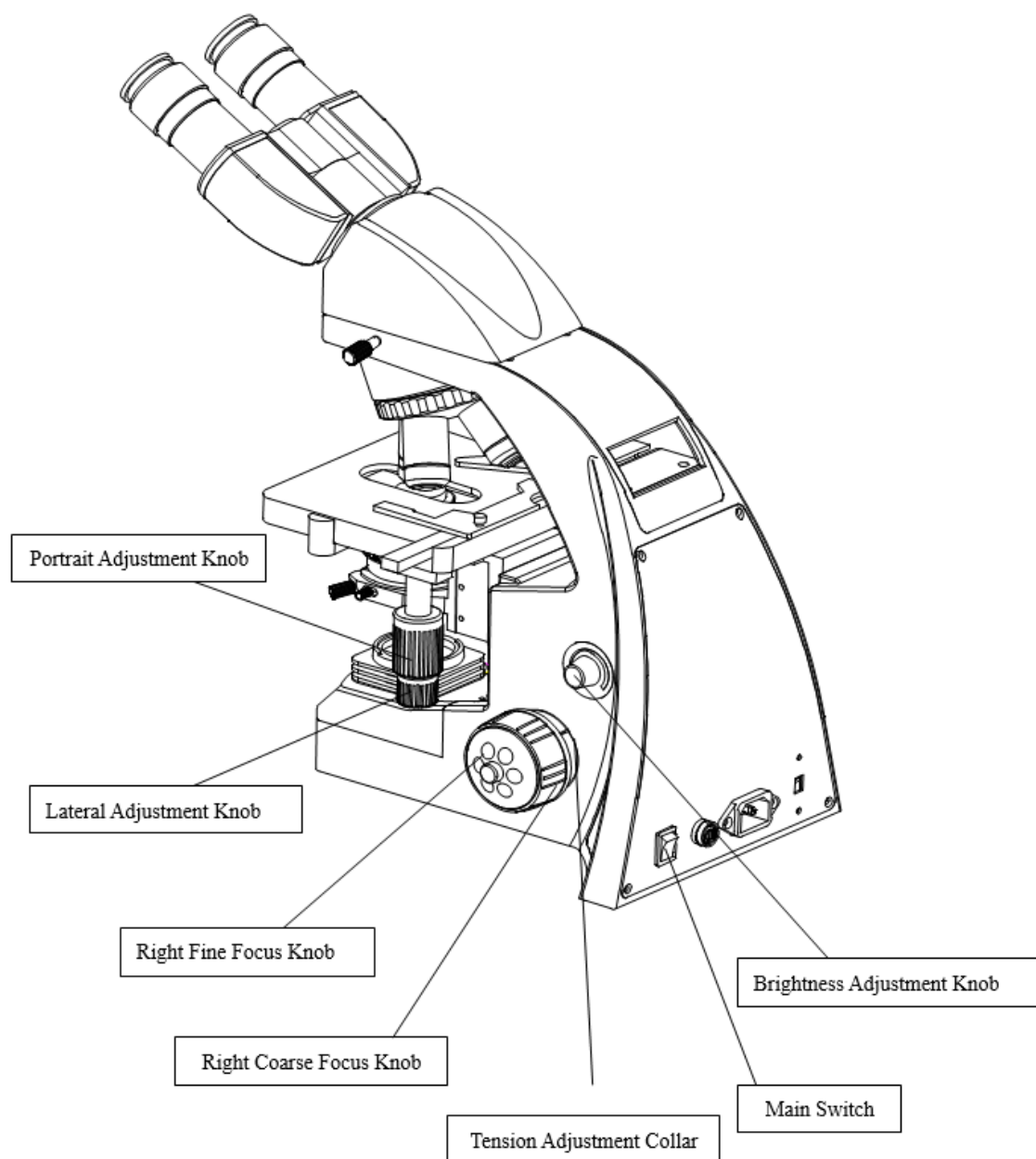


Fig. 14

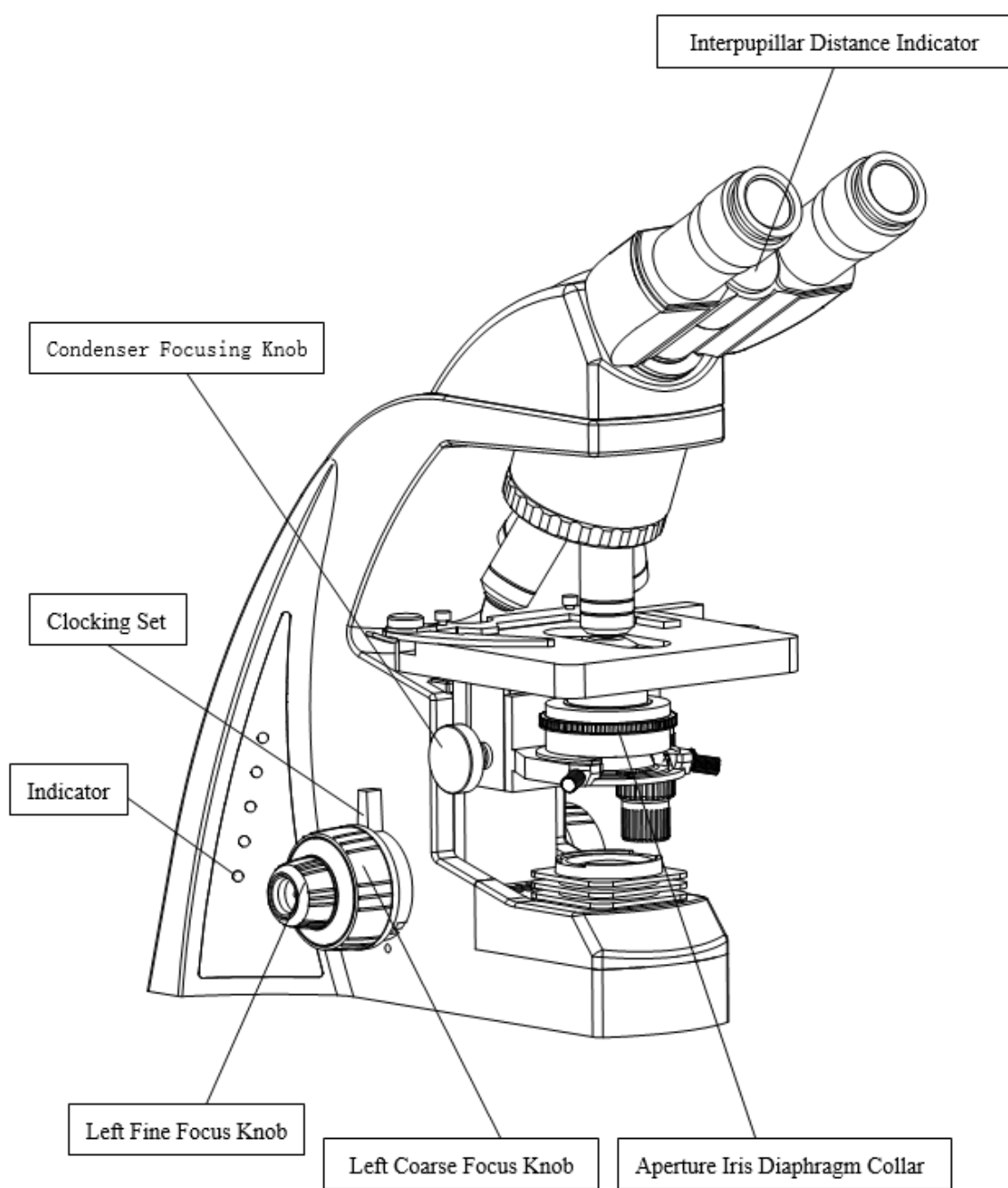


Fig. 15

## 3.2 Adjustment and Operation

### 3.2.1 Brightness Adjustment (Fig.16)

1. Connect the power cord and set the main switch to “—” state (ON).
2. Turning the brightness adjustment knob clockwise, the voltage raises, and the brightness strengthen, whereas turning at the contra direction, the voltage decline, and the brightness weaken.

★ Using the microscope with low voltage in the voltage range can prolong the service life of the bulb.

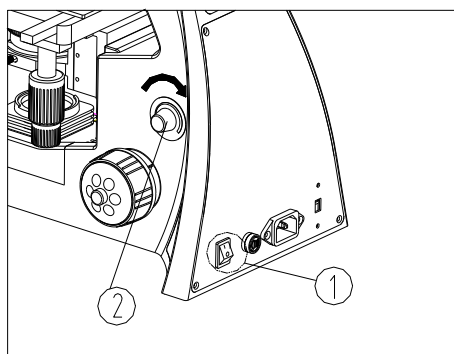


Fig. 16

### 3.2.2 Placing the Specimen (Fig.17)

1. Place the specimen ① in the centre of the mechanical stage and use the stage clips to clamp it.
2. Turn the portrait and lateral adjustment knob ② of the mechanical ruler, move the specimen to the required position.

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

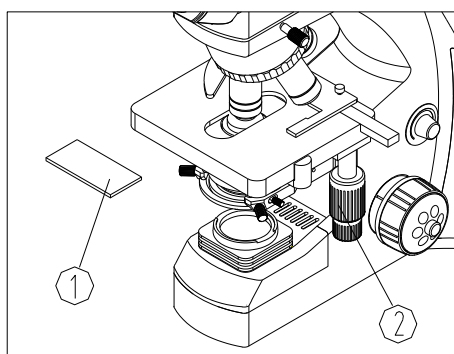


Fig. 17

### 3.2.3 Focusing the Specimen (Fig.18)

1. Focus the specimen with 10X objective. To avoid the objective touching the specimen during focusing, you should raise the mechanical stage to let the specimen close to the objective at first, then slowly separate them to bring the specimen to focus.

Turn the coarse focus knob ① conversely to lower the specimen and search images in the 10×ocular simultaneously and then use the fine knob② to focus. After that, you can replace with other magnification objectives safely and focus without the risk of damaging the specimen.

★ To make the observation more convenient, you can use the locking set ③ to fix the stage in a vertical direction.

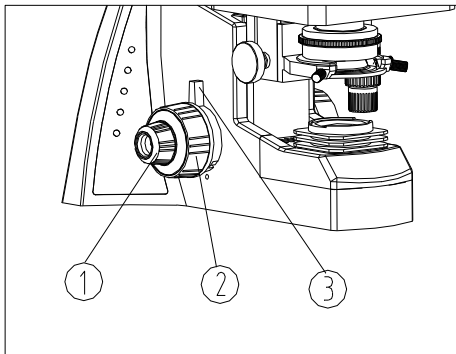


Fig. 18

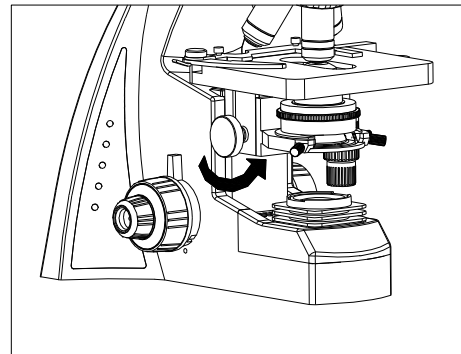


Fig. 19

### 3.2.4 Condenser Adjustment (Fig.20)

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

★ The condenser and the objective are coaxial. It has been adjusted before leaving factory, so the user needn't to adjust them by self

★ The highest position of the condenser has been adjusted too. It also needn't any user's operation.

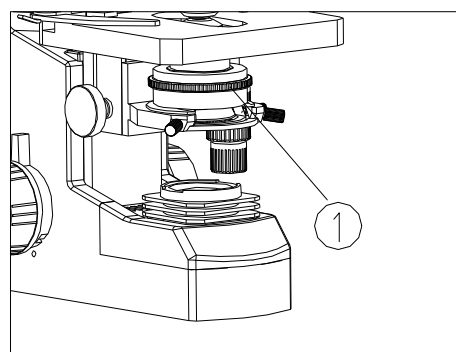


Fig. 20

### 3.2.5 Aperture Iris Diaphragm Adjustment (Fig.20)

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

★ The aperture iris diaphragm is designed for the adjustment of the numerical aperture, not for the brightness.

Generally, setting the aperture iris diaphragm to 70- 80% of the N.A. of the objective in use will provide an image with good contrast. 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.

### 3.2.6 Adjusting the Interpupillary Distance (Fig.21)

The interpupillary distance range:

55mm~75mm.

While looking through the eyepieces, move both eyepieces until the left and right fields of view coincide completely.

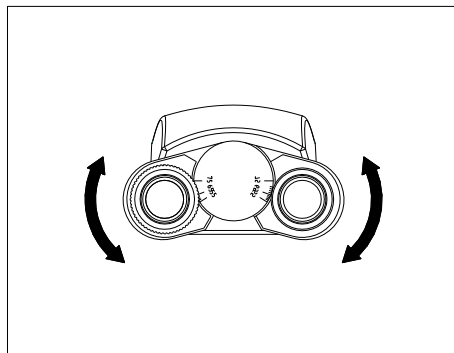


Fig. 21

### 3.2.7 Adjusting the Dioptre (Fig.22)

Turn the eyepiece ① to adjust the dioptre while looking through it.

★ The dioptre range of the eyepiece is  $\pm 5$  dioptre. The number aligned to the line on the viewing head is the dioptre in use.

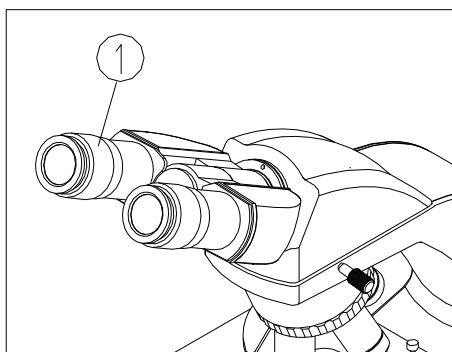


Fig. 22

### 3.2.8 Adjusting the tension adjustment collar (Fig.23)

Turn the tension adjustment collar ① with your fingers. When the collar is turned in the direction of the arrow, tension of the coarse adjustment knob ② increases. Turning the collar in the opposite direction decreases the tension.

If the nosepiece descends on its own or if the specimen gets out of focus quickly even when it is brought into focus using the fine adjustment knob ③, it means the tension of the coarse adjustment knob is too low. Turn the collar in the direction of the arrow to increase the tension

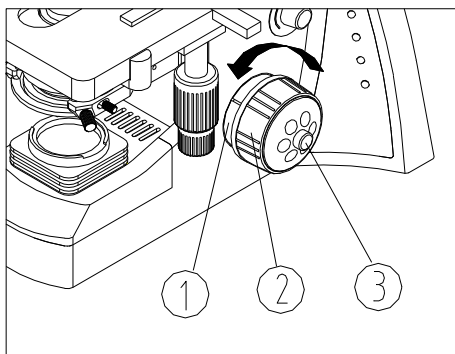


Fig. 23

## 4. Technical Specifications

### 1) Main Specifications

|                |                                                                                         |
|----------------|-----------------------------------------------------------------------------------------|
| Optical System | Infinite optical system                                                                 |
| Viewing Head   | Siedentopf Binocular Head, 30°Inclined, Interpupillary Distance 48-75 mm                |
| Eyepiece       | Wide Field Eyepiece WF 10X/20mm                                                         |
| Nosepiece      | Quadruple Nosepiece                                                                     |
| Objective      | Infinite Semi-plan Objectives or Infinite Plan Achromatic Objectives 4×, 10×, 40×, 100× |
| Focusing       | Coaxial Coarse and Fine Adjustment, Moving Range 25mm, Fine Division 0.002mm            |
| Condenser      | Abbe Condenser, NA=1.25                                                                 |
| Stage          | Double Layers Mechanical Stage 140mm×140mm, Moving Range 75×50mm                        |
| Illumination   | 3W LED Lamp                                                                             |

## 2) Eyepiece and objectives

### 1. Objective

| Magnification | Numerical Aperture | Focal Length (mm) | Objective |
|---------------|--------------------|-------------------|-----------|
| 4×            | 0.10               | 45.3              | dry       |
| 10×           | 0.25               | 17.96             | dry       |
| 40×           | 0.65               | 4.5               | dry       |
| 100×          | 1.25               | 1.81              | oil       |

### 2. Eyepiece

| Eyepiece                 | Magnification | Focal Length (mm) | Field of View (mm) |
|--------------------------|---------------|-------------------|--------------------|
| Wide field plan eyepiece | 10×           | 25                | φ22                |

## 5. Outfit

|              |                                         |          |
|--------------|-----------------------------------------|----------|
| Main Body    | Main Standard                           | ○        |
|              | Double Layers Mechanical Stage          | ○        |
|              | Condenser Holder                        | ○        |
| Viewing Head | Siedentopf Binocular Head               | ○        |
|              | Siedentopf Trinocular Head              | ○        |
| Condenser    | Abbe Condenser, NA=1.25                 | ○        |
| Nosepiece    | Quadruple                               | ○        |
| Illumination | 3W LED Lamp                             | ○        |
|              | Spare Bulb                              | ○        |
| Eyepiece     | 10×Wide Field Plan Eyepiece             | ○        |
| Objective    | Infinite Semi-Plan Objective 4×         | ○        |
|              | Infinite Semi-Plan Objective 10×        | ○        |
|              | Infinite Semi-Plan Objective 40×        | ○        |
|              | Infinite Semi-Plan Objective 100× (Oil) | ○        |
|              | Infinite Plan Objective 4×              | Optional |
|              | Infinite Plan Objective 10×             | Optional |

|           |                                                       |          |
|-----------|-------------------------------------------------------|----------|
|           | Infinite Plan Objective 40×                           | Optional |
|           | Infinite Plan Objective 100× (Oil)                    | Optional |
| Condenser | Bright Field Condenser with Adjustable Iris Diaphragm | ○        |
| Filter    | Baby Blue, Green                                      | ○        |

## 6. Camera mounting

Prior recommendation: work with the microscope switched off and on a clean surface to prevent screws from being lost or components from being damaged.

### Required components

| Componente                        | Code         |
|-----------------------------------|--------------|
| Quantum Pro trinocular microscope | MP04-003-001 |
| 0.5X C-mount camera adapter       | MPAC-066-001 |
| Connector for the adapter         | MPAC-082-001 |
| SNAP camera (example)             | CMUB-***     |

### Installation procedure

#### Step 1. Remove the factory-fitted adapter

Remove the white adapter that comes factory-fitted in the trinocular port. Remove the 3 screws and keep them, as they will be used again to secure the MPAC-082-001 connector.

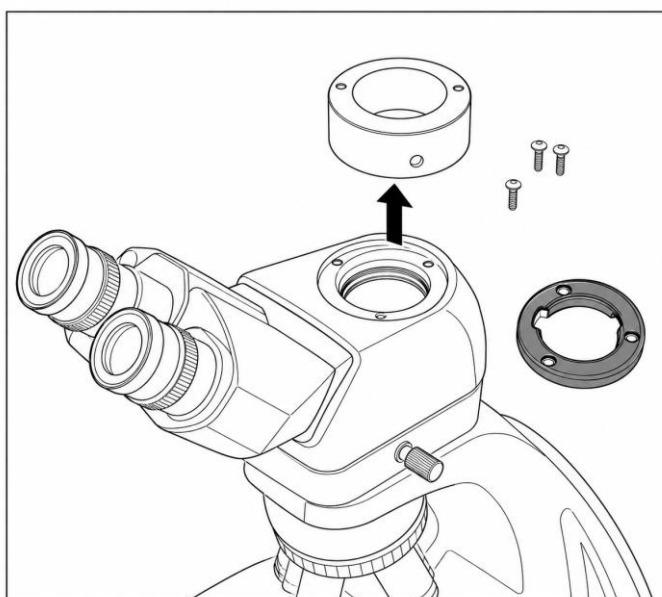


Fig. 1

### Step 2. Fit the MPAC-082-001 connector

Place the MPAC-082-001 connector onto the trinocular port, aligning its holes with those on the microscope. Then screw the connector into place using the 3 screws removed in the previous step.

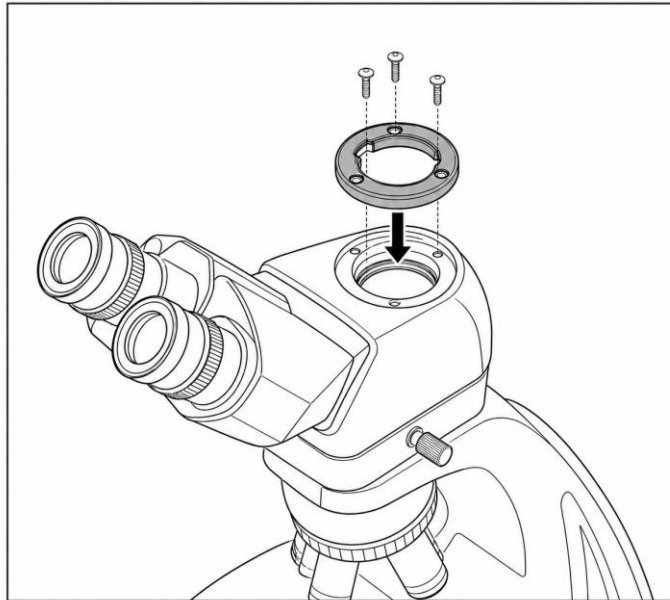


Fig. 2

### Step 3. Install the MPAC-066-001 0.5X C-mount adapter

Insert the MPAC-066-001 adapter into the connector already installed. Then use the microscope's side screw to tighten the grip and secure the adapter in position.

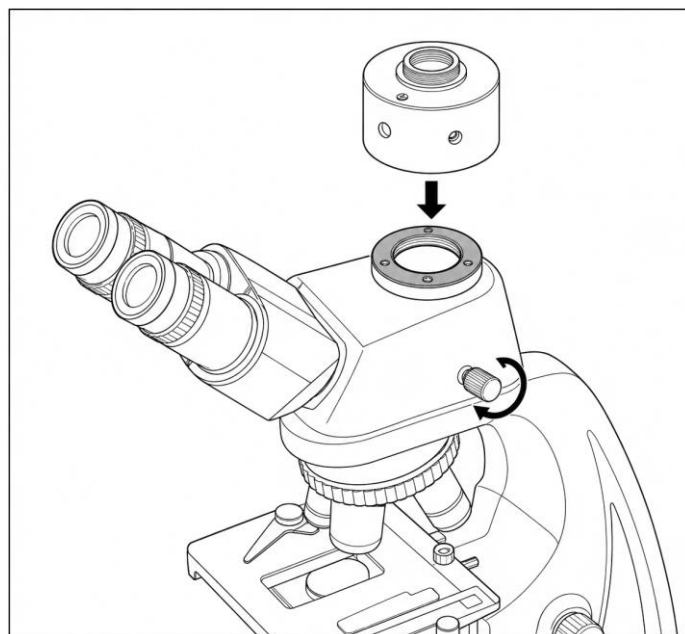


Fig. 3

#### Step 4. Screw on the SNAP camera

Screw the SNAP camera (CMUB-\*\*\* ) onto the top of the MPAC-066-001 adapter until it is properly secured. Tighten it only as much as necessary to secure it, without forcing the thread.

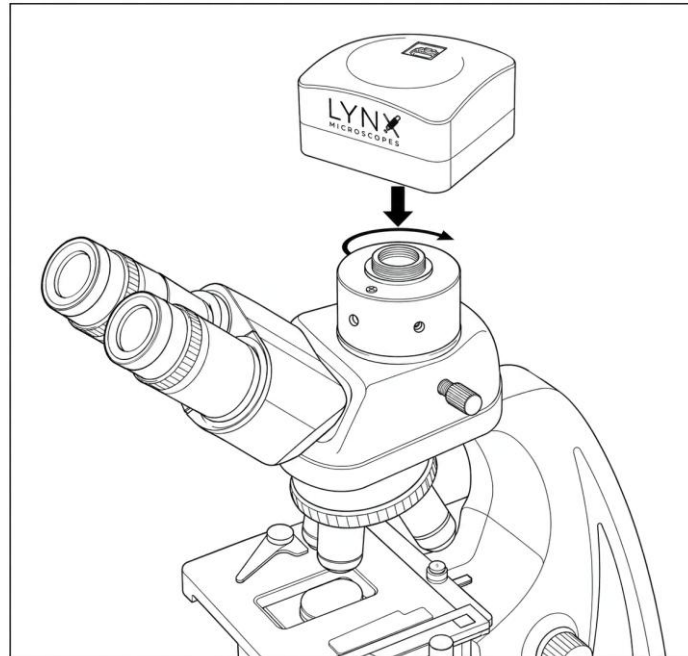


Fig. 4

## 7. Troubleshooting Guide

### 1. Optical System

| TROUBLE                                                                    | CAUSE                                                                               | SOLUTION                                      |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|
| 1. The edge of the field of view is dark, or the brightness is not uniform | The nosepiece is not in the located position (objective and light path not coaxial) | Locate the nosepiece properly where it clicks |
|                                                                            | The surface of the lamp becomes black                                               | Change a new lamp bulb                        |
|                                                                            | A lens (the objective, condenser, eyepiece or collector) is dirty.                  | Clean it thoroughly                           |
| 2. Dirt or dust is visible in the field of view                            | Dirt/dust on the specimen                                                           | Replace with a clean specimen                 |
|                                                                            | Dirt/dust on the eyepieces                                                          | Clean them                                    |
| 3. Visibility is poor Image is                                             | Specimen is not covered                                                             | Add cover glass on it                         |

|                                                        |                                                                    |                                                   |
|--------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------|
| not sharp; Contrast is poor;<br>Details are indistinct | The thickness of the cover glass is not suitable                   | Use standard cover glass with thickness of 0.17mm |
|                                                        | Specimen is placed reversely                                       | Turn it over                                      |
|                                                        | Dry objective has oil on it. (especially for 40X objectives)       | Wipe the oil                                      |
|                                                        | A lens (the objective, condenser, eyepiece or collector) is dirty. | Clean it                                          |
|                                                        | Immersion oil is not used with the 100x objective                  | Use specified oil                                 |
|                                                        | Air bubbles existed in the immersion oil                           | Eliminate the bubble                              |
|                                                        | The aperture iris diaphragm is stopped down too far                | Adjust the aperture iris diaphragm properly       |
|                                                        | Dirt or dust on the eyepiece                                       | Clean it                                          |
| 4. One side of image is blurred                        | Condenser is not properly centred                                  | Centre the condenser with the centring screw      |
|                                                        | The nosepiece is not properly engaged                              | Engage the nosepiece properly                     |
|                                                        | The specimen is not clamped                                        | Clamp it with stage clips                         |
| 5. The image is yellowish                              | The blue filter is not used                                        | Use the blue filter                               |
| 6. The brightness is not enough                        | The aperture iris diaphragm is too small                           | Adjust it properly                                |
|                                                        | The condenser is too low                                           | Adjust it properly                                |
|                                                        | A lens (the objective, condenser, eyepiece or collector) is dirty. | Clean it                                          |

## 2. Mechanical System

| TROUBLE                                                      | CAUSE                                                     | SOLUTION                       |
|--------------------------------------------------------------|-----------------------------------------------------------|--------------------------------|
| 1. Field of view of one eye does not match that of the other | Interpupillary distance is incorrect                      | Adjust interpupillary distance |
| 2. Observation is tiring                                     | The dioptré is not proper                                 | Adjust the dioptré properly    |
|                                                              | The brightness of the illumination is not proper for eyes | Adjust the lamp voltage        |

### 3. Electrical System

| TROUBLE                                  | CAUSE                                                         | SOLUTION                                     |
|------------------------------------------|---------------------------------------------------------------|----------------------------------------------|
| 1. The bulb cannot light                 | No power supply                                               | Check the power cord connection              |
|                                          | The pin of the bulb doesn't insert properly                   | Insert the pin deeply                        |
|                                          | The bulb broken                                               | Replace with a new one                       |
| 2. The bulb burns out suddenly           | The bulb is not the specified one.<br>The voltage is too high | Use the specified bulb.<br>Lower the voltage |
| 3. The illumination is not bright enough | the voltage is too low                                        | Raise the voltage                            |
| 4. Image flicks                          | The bulb is about to burn out                                 | Replace with a new one                       |
|                                          | The bulb is not inserted deeply                               | Check its connection                         |

### **Nota importante para los aparatos electrónicos vendidos en España**

Instrucciones sobre la protección del medio ambiente y la eliminación de aparatos electrónicos:



Los aparatos eléctricos y electrónicos marcados con este símbolo no pueden ser eliminados en forma de residuos urbanos.

De conformidad con la Directiva 2012/19/UE, los usuarios de la Unión Europea de aparatos eléctricos y electrónicos, tienen la posibilidad de devolver sus RAEE para su eliminación al distribuidor o fabricante del equipo después de la compra de uno nuevo. La eliminación ilegal de aparatos eléctricos y electrónicos es castigada con multa administrativa.

### **Remarque importante pour les appareils électroniques vendus en France**

Informations sur la protection du milieu environnemental et élimination des déchets électroniques :



Les appareils électriques et électroniques portant ce symbole ne peuvent pas être jetés dans les décharges.

En réponse à la réglementation, Labbox remplit ses obligations relatives à la fin de vie des équipements électriques de laboratoire qu'il met sur le marché en finançant la filière de recyclage de ecosystem dédiée aux DEEE Pro qui les reprend gratuitement (plus d'informations sur [www.ecosystem.eco](http://www.ecosystem.eco)).

L'élimination illégale d'appareils électriques et électroniques est punie d'amende administrative.

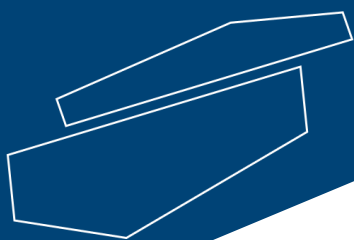
### **Nota importante per le apparecchiature elettroniche vendute in Italia**

Istruzioni sulla protezione ambientale e sullo smaltimento dei dispositivi elettronici:



Le apparecchiature elettriche ed elettroniche contrassegnate con questo simbolo non possono essere smaltite come rifiuti urbani.

In conformità con la Direttiva 2012/19 / UE, gli utenti dell'Unione Europea di apparecchiature elettriche ed elettroniche hanno la possibilità di restituire i propri RAEE per lo smaltimento al distributore o al produttore di apparecchiature dopo averne acquistato uno nuovo. La rimozione illegale di apparecchiature elettriche ed elettroniche è punibile con una sanzione amministrativa.



[www.labbox.com](http://www.labbox.com)