

User Manual

Brightfield Microscope

SWE-CX63

Please read the instructions carefully and keep them properly before using the product for future reference.

Wuhan Servicebio Technology Co.,Ltd.

CONTENTS

01 Safety and Labeling Instructions	/ 02
1.1 Safety Markings Explanation	/ 02
1.2 General Safety Instructions	/ 02
1.3 Labels and Symbols	/ 05
02 Product Overview	/ 07
2.1 Basic Product Information	/ 07
2.2 Technical Parameters	/ 07
2.3 Package Contents	/ 08
2.4 Product Configuration Specifications	/ 08

03 Main Component Names and Assembly	/ 11
3.1 Main Components	/ 11
3.2 Assembling the Main Unit	/ 12
3.3 Installing the Camera	/ 14
3.4 Steps for Brightfield Observation with Transmitted Light	/ 15
3.5 Basic Operations (For Specimen Observation)	/ 16
3.6 Basic Adjustments	/ 17
04 Troubleshooting Common Issues	/ 22
4.1 Optical System Faults	/ 22
4.2 Electrical System Faults	/ 24
4.3 Mechanical Device Faults	/ 24
05 Cleaning, Maintenance, and Care	/ 26
5.1 Cleaning	/ 26
5.2 Maintenance and Care	/ 26
06 Technical Specifications	/ 27
6.1 Environmental Specifications	/ 27
6.2 Power Supply Specifications	/ 27
6.3 Key Technical Parameters	/ 27
07 Electromagnetic Compatibility	/ 28



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED OPTICAL SERVICE PERSONNEL.



The lightning flash with an arrowhead symbol within an equilateral triangle is intended to alert the user of the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Please pay attention to the “lightning” and “exclamation mark” signs, indicating that incorrect operation may pose a risk of electric shock and warning of incorrect operation.

WARNING

TO AVOID THE RISK OF FIRE OR ELECTRICAL SHOCK, NEVER EXPOSE THIS PRODUCT TO WATER OR OPERATE IN A HIGH HUMIDITY ENVIRONMENT.

Caution

Keep the device away from the following environments:

High temperature and excessive humidity; Direct sunlight or other heat sources; Dust, water sources, and drainage pipes; Extreme vibrations.

Caution

If the optical lens surface is dirty, first try using a blower bulb to remove dust particles. Next, use lint-free lens paper, a lens cleaning cloth, or a professional lens cleaning wipe to gently clean the lens. Only use approved lens cleaning solutions. Never touch the lens with your fingers! Do not allow the device to come into contact with water or other liquids. If water or foreign objects enter the device, immediately unplug the power cable and do not attempt to plug it back in until it has dried completely over a long period. This does not guarantee that it will work again! Do not open the device casing or attempt to repair it yourself. Internal components may pose a risk of electric shock or fire. There are no user-serviceable parts inside. Use a clean, dry cloth to clean the exterior of the device. Do not use harsh or abrasive cleaners or organic solvents on any part of the device. If you notice smoke or a strange odor coming from the device, immediately unplug the power cable and contact our company. When disposing of this product, follow local laws or regulations.

01 Safety and Labeling Instructions

1.1 Safety Markings Explanation

If the product is not used in the manner described in this manual, it may endanger the user's safety. Additionally, it may damage the product. Please use the product only as described in this user manual.

The following symbols are used in this manual:

1.2 General Safety Instructions

Caution: Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.

Warning: Indicates a potentially hazardous situation that, if not avoided, could result in damage to the product or surrounding property, or cause various issues.

Note: Provides useful knowledge, information, or tips for use.

Caution

Preventing Infection

Use protective equipment such as lab gloves, goggles, and protective clothing.

When observing specimens that may be infectious, always wear protective gear such as lab gloves and goggles to avoid direct contact with the specimen.

Additionally, when performing routine maintenance on products that may have come into contact with infectious specimens, always wear gloves or disinfect the product beforehand. After observation, be sure to clean any parts that came into direct contact with the specimen.

Caution

Moving the Product

When moving the product, there is a risk of specimens falling or scattering. Always remove specimens beforehand. In the event of specimen breakage, immediately take measures to prevent infection.

When disposing of the product, always follow local government laws or regulations.

When disposing of products that may have come into contact with infectious specimens, always follow local government laws or regulations.

Warning

Do not allow the microscope to exceed a height of 1 meter. To prevent the microscope from tipping over, ensure that the total height from the top of the microscope to the table does not exceed 1 meter when assembling accessories.

Do not allow the total weight of the microscope to exceed 20 kg. To prevent the microscope from tipping over, ensure that the total weight does not exceed 20 kg when installing the arm, illuminator, intermediate attachments, tube, or camera to the main unit.

Caution

Electrical Safety

Always use power cords and power adapters approved by our company and certified under the GB4793.1-2007 standard.

If incorrect power adapters or power cords are used, the electrical safety and EMC (electromagnetic compatibility) performance of this product cannot be guaranteed. Equipment malfunctions caused by the use of unauthorized power cords or adapters will not be eligible for free warranty service.

This product complies with the radiation and immunity requirements described in the GB/T18268.1 series. Before using the product, assess the electromagnetic environment. Do not use this product near strong electromagnetic emission sources, as this may interfere with proper operation. Always use the power cords and adapters specified by the manufacturer. Otherwise, the safety and EMC performance of the product cannot be guaranteed. Ensure that the light box adapter is properly grounded; otherwise, the expected electrical safety and EMC performance cannot be guaranteed. Do not use this device near strong radiation sources (e.g., unshielded radio frequency sources), as this may interfere with the device's normal operation.

Caution

Handling and Moving

Hold the microscope by the arm handle and the front of the base: When moving the microscope, hold the handle of the arm and the front of the base (white area). Holding the black areas may make it difficult to stabilize the microscope. Grasping the stage, coarse/fine focus knobs, power cover on the back of the microscope, or the lower part of the light box may cause damage to the microscope.

Remove specimens and accessories: When moving the microscope, always remove specimens and eyepieces to prevent them from falling. Also, remove any installed accessories. Otherwise, the increased weight may raise the risk of the microscope falling.

Do not slide on the tabletop: When moving the microscope, do not slide it on the tabletop. This may damage the rubber feet.

Caution

Grounding Requirement

Connect the grounding terminal of the power cord to the grounding terminal of the power outlet. If the device is not grounded, the expected electrical safety and EMC performance of the device cannot be guaranteed. Using the product near strong electromagnetic fields or radiation sources may interfere with its normal operation. Before using the product, always assess the electromagnetic environment.

Caution

Using the product near strong electromagnetic fields or radiation sources may interfere with its normal operation.

Before using the product, always assess the electromagnetic environment.

Caution

In the event of an emergency, always unplug the power cord from the device's connector or the power outlet.

Ensure the product is placed in a location where the power connector or outlet is easily accessible for quick disconnection.

Caution

Preventing Electric Shock

Keep power cords and cables away from heat sources, flames, and the light source chamber.

If power cords or cables come into contact with high-temperature areas of the light chamber, they may melt, leading to a risk of electric shock.

Do not insert tools or metal objects into the product's ventilation holes, as this may cause electric shock or damage to the product.

Do not touch the product with wet hands, especially the main power switch or power cord, as this may result in electric shock, fire, or product malfunction.

Caution

Preventing Fire

Do not attempt to repair, disassemble, or modify the product. Unauthorized disassembly, repair, or modification by users is strictly prohibited, as it may cause fire or other damage. Repairs by unauthorized third parties, except those authorized by our company, will void the warranty and may degrade performance.

Caution

Avoid Direct Exposure to Light Sources

Do not stare directly at the light source for extended periods: If the light appears too bright during observation, use the brightness control knob to adjust the intensity. While the built-in LED is safe under normal use, prolonged direct exposure to the LED light may cause eye damage.

Do not stare directly at light from the condenser or reflected light from the specimen: Prolonged exposure to light from the condenser may cause eye damage.

Avoid prolonged skin exposure to light from the condenser: Prolonged skin exposure to light from the condenser may cause burns.

Caution

Preventing Pinching Injuries

When operating motorized components, do not touch or obstruct moving parts with fingers or tools to avoid pinching injuries or other accidental harm.

1.3 Labels and Symbols

Reference

Safety Symbols

The product is marked with the following symbols. Please understand their meanings and operate with caution.

Symbol	Meaning
	Indicates a general hazard. Always follow the precautions listed in the user manual and those associated with this symbol
	Indicates the "ON" position of the main switch (rocker switch)
	Indicates the "OFF" position of the main switch
	Indicates that this component may become hot during operation, posing a burn risk. Allow it to cool before replacing or handling
	Indicates a potential biological hazard

Reference

Safety Symbols

Symbol	Meaning
	Place the product in an upward position
	Stack no more than 5 layers
	Handle with care
	Protect from rain and moisture

Reference

Product Storage

During storage and transportation, the product should be kept within the following temperature and humidity conditions:Temperature: -20°C to +50°CMaximum Humidity:85% RH (no condensation)Exceeding these ranges may damage the device, leading to malfunctions or operational issues.

Reference

Service Life

When used and stored according to the instructions in the user manual, the product has a service life of 8 years from the date of purchase. Continued use beyond this period is not permitted, as internal electronic components, circuits, metal, plastic, and rubber parts may have degraded due to aging.

02 Product Overview

2.1 Basic Product Information

Product Name	Brightfield Microscope
Cat.No.	SWE-CX63
Manual Approval & Revision Date	January 16, 2025 Updated: Same as above
Intended Use	This product is designed for optical magnification and observation of biological samples, suitable for education, scientific research, biomedical research, and related fields
Key Components	Includes eyepiece, objective lens, observation tube, mounting arm, main body, stage, objective turret, condenser, lamp housing, immersion oil, camera port, camera, power adapter, and power cord. Optional accessories: micrometer, fluorescence illuminator, filters, filter blocks, and inserts
Performance & Working Principle	The biological microscope is a precision optical instrument used to observe biological tissue sections, cells, bacteria, microorganisms, cell cultures, fluid suspensions, and other transparent or semi-transparent materials (e.g., crystals, powders, traditional Chinese medicine particles). It is widely applied in healthcare, universities, research institutes, and fields such as cytology, microbiology, parasitology, pathology, immunology, genetic engineering, botany, and zoology. The microscope utilizes the refractive properties of light across different media, employing lenses to optically magnify and image specimens for detailed observation
Product Description	Composed of an observation system, illumination system, and stage. The observation system includes an eyepiece and objective lens for optical magnification, with optional external image capture. It does not support image scanning or analysis

2.2 Technical Parameters

Bulb Power	10W/5V
Bulb Lifespan	60,000 hours (50% brightness decay at ~25,000 hours)
Operating Voltage	DC 12V via AC 90V-230V adapter

Eyepiece Magnification	10×
Objective Magnification	4 ×, 10 ×, 20 ×, 40 × (selectable)
Observation Method	Brightfield

2.3 Package Contents

Eyepiece	1 pair
Objective	1 set (4 ×、10 ×、20 ×、40 ×)
Main Body	1 set (Including Observation Tube,Stage,Objective Turret, Lightbox and power supply)
Quality Certificate	1 set
User Manual	1 piece
Packing Dimension	403×353×353mm
Weight	Gross weight: 10kg; Net weight: 7.8kg (brightfield configuration)

2.4 Product Configuration Specifications

Optical System	ECGO Infinity Double Chromatic Aberration Correction System
Parfocal Distance	45mm
Body Structure	Full-metal streamlined body made of high-quality aluminum alloy using one-time forming technology. Nano-silver ion antibacterial coating inhibits microbial growth. Ergonomic back handle for single-handed portability. Features: Wide-voltage adapter (90~230V), USB control output, ECO energy-saving mode, LIM light management, stepless brightness adjustment, dual power supply (USB 5V/2A), touch-sensitive switches, computer-recognized objective positions, auto-scale switching, and preset parameter loading.

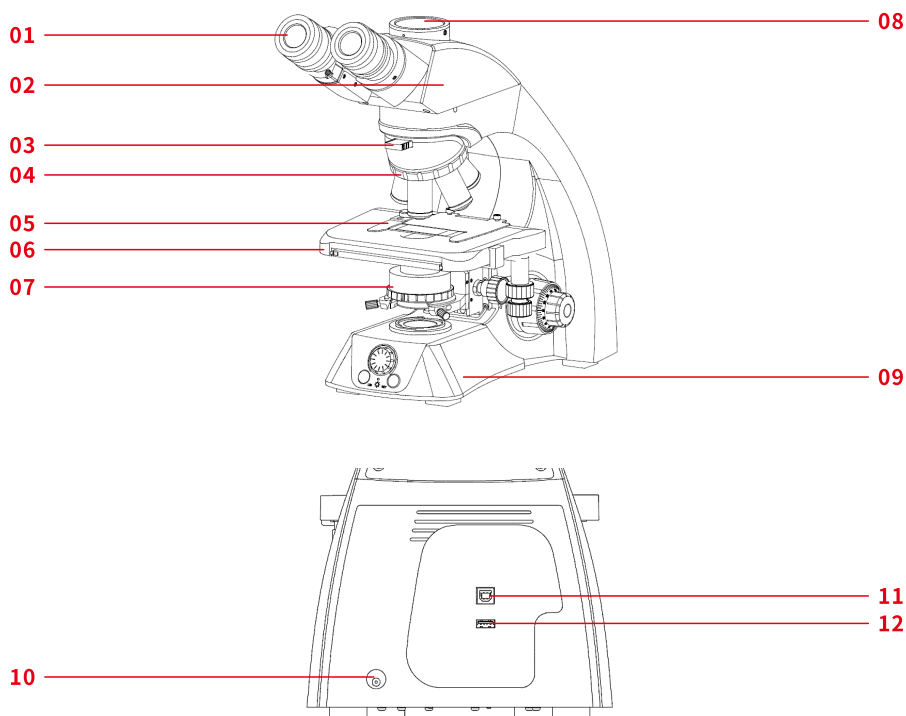
Illumination System	Köhler illumination with SUPERLED™ white LED chip (high color rendering index, $\geq 60,000$-hour lifespan) 10W output equivalent to 100W halogen; 4500K constant color temperature Supports LIM and ECO modes; 45mm filter compatibility
Focusing System	Coarse/fine focus knobs synchronized for both left-and right-hand operation. Minimum fine-tuning step: 1μm tension adjustment and height limiters. Optional motorized Z-axis kit with absolute coordinate measurement Fine focus rotation per circle: 0.1mm coarse focus rotation per circle: 34mm vertical travel: 19mm
Objective Turret	Integrated 5-hole manual/encoded turret with RMS-standard threads Auto-recognition of magnification and preset brightness adjustments
Stage	Low-position right-hand mechanical stage with wear-resistant ceramic coating Alloy steel wire drive mechanism; 76$\times$25mm travel range; supports thick slides Smooth tension control and ergonomic design
Slide Holder	Slow-return left-side holder compatible with heavy samples (e.g., cell counting chambers)
Condenser	Pre-centered motorized condenser (NA 0.1~1.1) with aperture scale. Supports brightfield, polarized light, phase contrast, and darkfield
Observation Tube	30° tilting trinocular tube (50/50 beam split), adjustable eyepoint height, 45~78mm interpupillary distance
Eyepieces	30mm ultra-widefield 10x eyepieces (F.N.=23); optional crosshair reticle Diopter adjustment for reduced eye strain
Objectives	ECGO plan achromatic objectives with infinity correction
Camera Port	Adjustable standard C-mount (0.5$\times$ reduction)
Anti-Mold Design	The observation tube, eyepieces, objectives, and other optical imaging components undergo antibacterial and anti-mold treatment to inhibit microbial growth and ensure long-term clarity

Control Software	Brand-specific integrated control software for motion, illumination, and imaging
Environmental Compliance	Lead-free optical glass compliant with RoHS
Convenient Operation	The body is equipped with a QR code label, and using the mobile phone scan function can provide convenient functions such as online usage instructions, online fault reporting, and scheduled repairs
Weight	Gross weight: 10Kg; Net weight: 7.8Kg (brightfield configuration)
Packing Dimension	403×353×353mm

03 Main Component Names and Assembly

3.1 Main Components

The legend only displays the main components



01 Eyepiece

02 Observation Tube

03 Analyzer

04 Objective Turret

05 Slide Holder

06 Stage

07 Condenser

08 Camera Port (Trinocular)

09 Main Body

10 Power Jack (DC 12V Input)

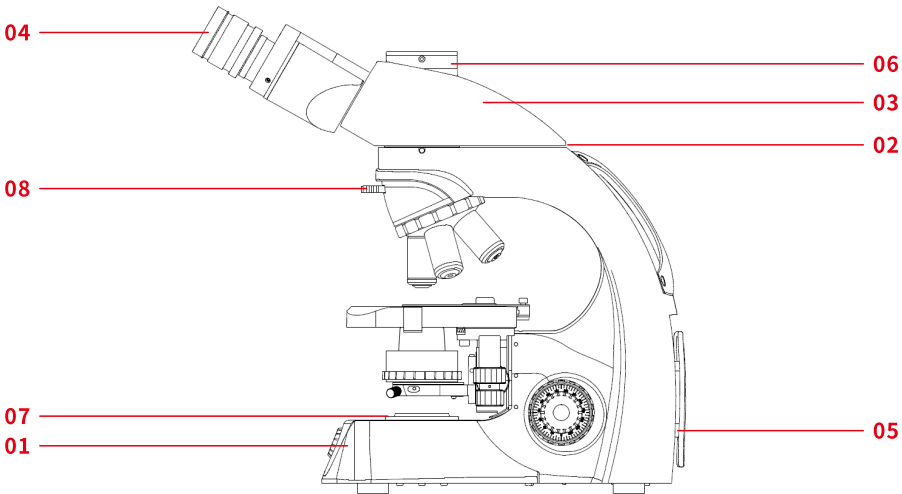
11 Computer USB Port

12 Output Power Port
(DC 5V/2A Output)

3.2 Assembling the Main Unit

Using the standard configuration model as an example, assemble the following components from bottom to top in the order indicated by the numbers in the diagram.

The entire assembly process requires only one type of hex key tool, a 3# hex key (3mm across flats).



- 01** Remove the microscope main unit.
- 02** Install the reflected illuminator (if applicable)
- 03** Install the observation tube
- 04** Install the eyepieces
- 05** Connect the power cord (DC12V power adapter)
- 06** Install the camera interface and camera (if applicable)
- 07** Install the filter and polarizer (if applicable)
- 08** Install the analyzer (if applicable)

Note

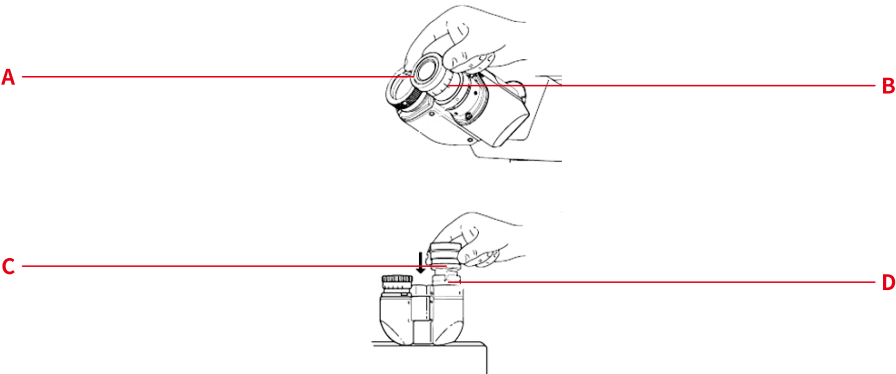
Before assembling the components, remove all packaging materials and temporary fasteners.

All components are installed and adjusted using a 3# hex key. Do not use other tools to disassemble other parts, as they may not be able to be restored after disassembly.

Installing the Eyepieces

Insert Eyepiece A into the bottom of Eyepiece Tube B. During installation, ensure the locating pin is inserted into the locating groove of the eyepiece tube.

When using an eyepiece equipped with a micrometer scale, insert the eyepiece into the right eyepiece tube. In this case, install the eyepiece so that the eyepiece locating pin C enters the groove D below the eyepiece tube.

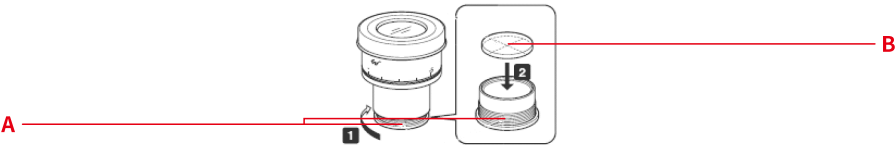


Installing the Eyepiece Micrometer (Optional)

The eyepiece micrometer can be used to inspect and measure the dimensions of observed images or to determine the center position of the field of view. The eyepiece micrometer must be calibrated using a stage micrometer before measurements can be taken. For information on different types of eyepiece micrometers, please contact our sales representatives.

- 1. Hold the eyepiece frame and rotate it in the direction of the arrow to remove the built-in micrometer holder A.
- 2. Insert the eyepiece micrometer B into the removed micrometer holder with the scale text facing downward.
- 3. Screw the eyepiece micrometer holder A back onto the bottom of the eyepiece.

Note: Avoid touching the surface of the micrometer with your fingers during operation. If any contaminants remain, clean it using the provided lens cleaning paper.



3.3 Installing the Camera

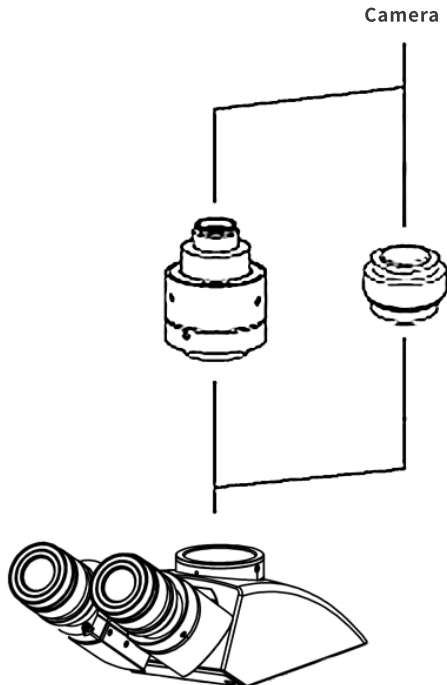
Installing the Camera/Imaging Device

1. Attach the camera adapter (imaging interface) and microscope camera to the trinocular tube. The image observed under the microscope can be viewed on the screen. The image capture range is determined by the size of the camera's image sensor and the magnification of the camera adapter.

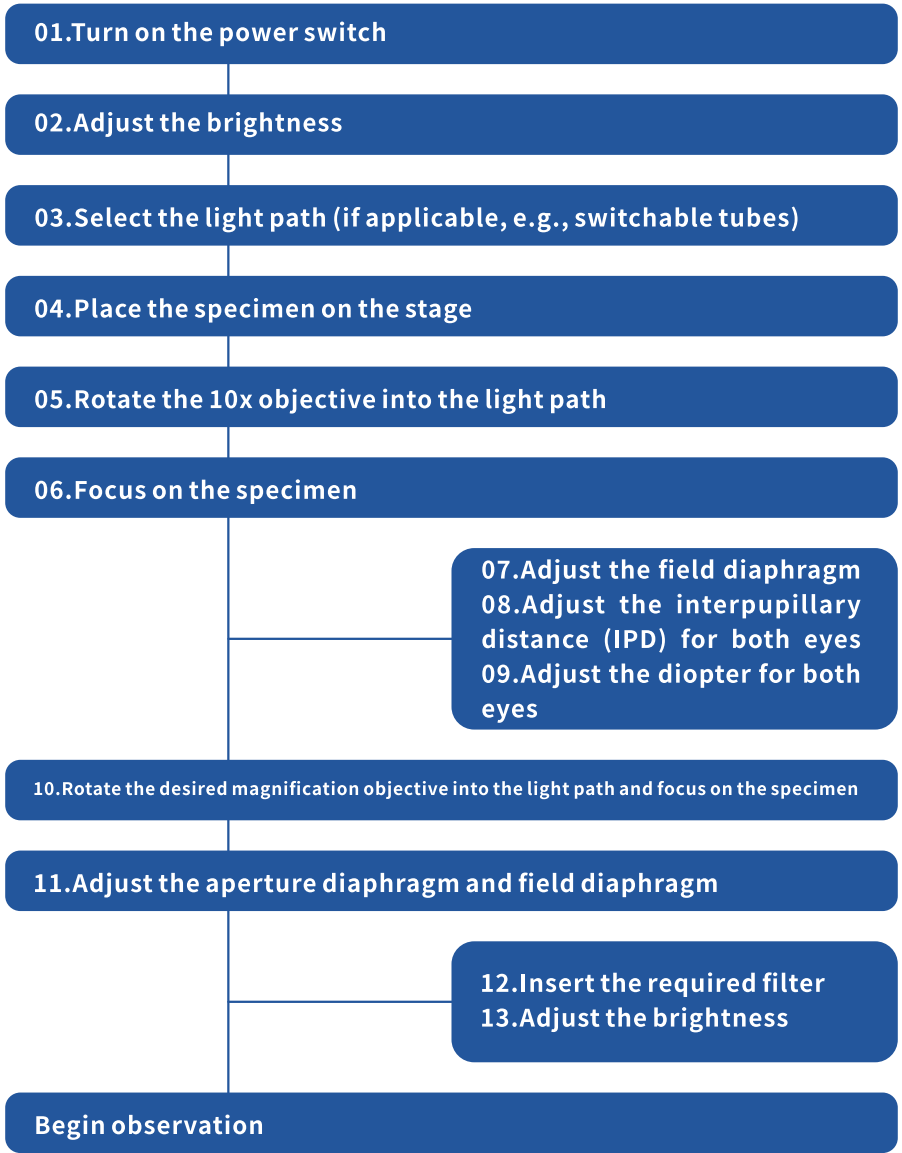
2. When using the camera adapter (imaging interface), ensure that the screen display and the eyepiece are parfocal. Otherwise, the image focus through the eyepiece will not synchronize with the focus captured by the camera.

3. To use the parfocal adjustment function of the camera adapter (imaging interface), follow these steps: First, focus the image clearly under the eyepiece. Then, loosen the locking screw (LOCK) on the side of the camera adapter. Use a hex key to rotate the focus screw (FOCUS) until the screen also displays the sharpest focus. Finally, tighten the locking screw (LOCK) to complete the parfocal adjustment. For a 1× camera adapter (imaging interface), there is no focus screw (FOCUS). Instead, adjust the focus by rotating the lower part of the interface to extend or retract the total height. Once focused, tighten the locking screw.

Note: After completing the parfocal adjustment, ensure the camera's orientation is adjusted so that the movement direction of the sample under the microscope matches the movement direction on the display screen. Typically, the camera's logo should face the user, with the data cable positioned directly at the back.



3.4 Steps for Brightfield Observation with Transmitted Light



3.5 Basic Operations (For Specimen Observation)

This section explains the basic operations of the microscope for observing specimens. For detailed steps on each component, refer to the corresponding chapters.

1. Turn on the power switch of the microscope main unit. When the power is on, indicator light A will illuminate;

Note: If the transmitted light source does not turn on, it may be set to the reflected light mode. Press and hold the brightness control knob and the SET button for 2 seconds to switch the light source controlled by the knob (toggle between transmitted and reflected light);

2. Rotate the brightness control knob to set the appropriate brightness. Press the knob to turn the light on or off (secondary switch);

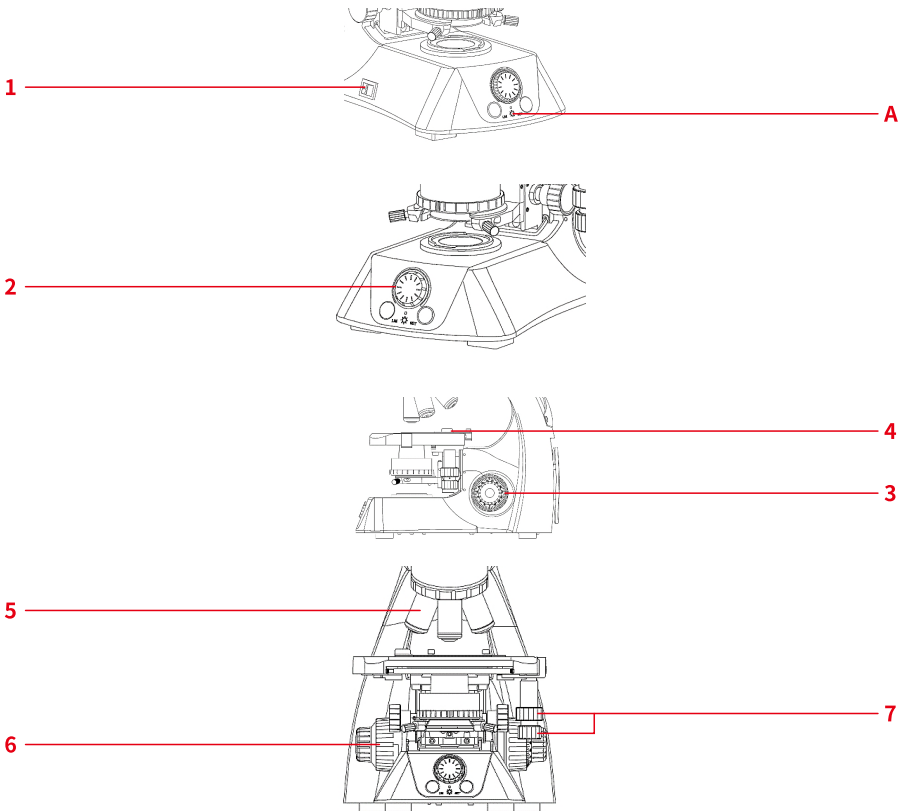
3. Rotate the coarse and fine focus knobs on the right side counterclockwise to lower the stage;

4. Open the specimen holder clamp and place the specimen in the appropriate position;

5. Rotate the nosepiece to bring the 10× objective into the light path;

6. Use the coarse and fine focus knobs to focus on the specimen;

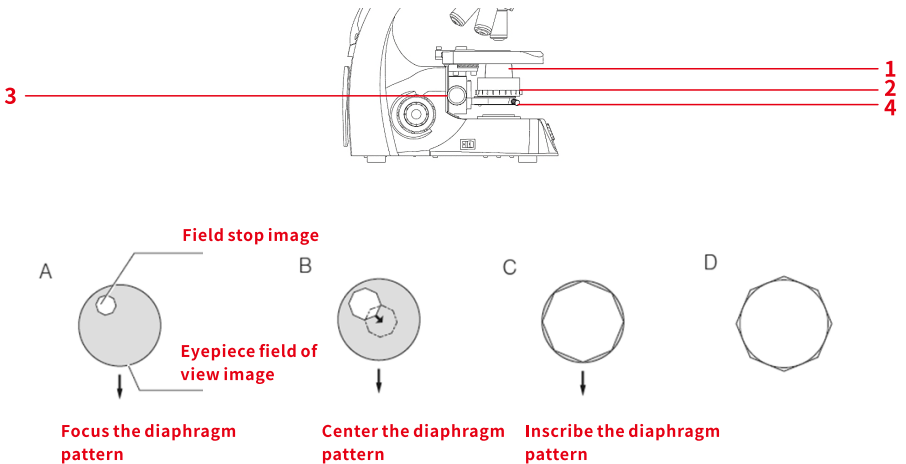
7. Rotate the X-axis and Y-axis knobs to adjust the specimen's observation position.



3.6 Basic Adjustments

Köhler Illumination

- 1.Center the field diaphragm (FS). Raise the condenser to its highest position and engage the top lens (if applicable). Rotate the nosepiece to bring the 10x objective into the light path and focus on the specimen;
- 2.Rotate the field diaphragm ring to reduce the field diaphragm to the center of the field of view;
- 3.Adjust the condenser height knob to focus on the field diaphragm blades;
- 4.Use the centering screws (left and right) to center the field diaphragm image in the field of view;
- 5.Rotate the field diaphragm ring clockwise to gradually open the field diaphragm until the field diaphragm image is inscribed within the eyepiece field. If the field diaphragm edges do not align perfectly, readjust the centering screws;
- 6.Open the field diaphragm until the field diaphragm image is circumscribed around the eyepiece field (no shadows or vignetting). Centering is now complete.



Adjusting Interpupillary Distance (IPD)

IPD adjustment aligns the distance between the two eyepieces to match the distance between the observer's eyes. Proper IPD adjustment ensures the left and right eye images overlap completely, reducing eye strain and preventing dizziness or nausea.

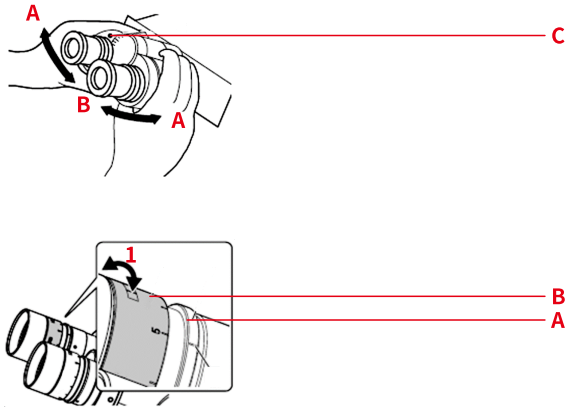
- 1.Hold both eyepiece tubes and widen the distance between them to the maximum;
- 2.While looking through the eyepieces, gradually reduce the distance between the eyepiece tubes until the left and right field images overlap completely. The scale on the eyepiece tube indicates the current IPD. Record this value for quick adjustment in future observations.

Adjusting Diopter

Diopter adjustment corrects differences in vision between the observer's left and right eyes. This adjustment is crucial for users who wear glasses (for nearsightedness or farsightedness) and observe without them. It reduces eye strain and prevents dizziness or nausea. For eyepieces with micrometers, diopter adjustment ensures accurate focus on the scale.

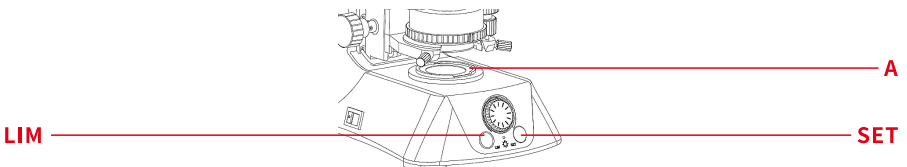
1. Use the fine focus knob to focus the image clearly for one eye (usually the eyepiece with the micrometer);
2. Adjust the diopter on the other eyepiece to focus the image clearly for the other eye.

Note: The default diopter position is at the 0 mark, ensuring synchronized focus between the eyepiece and camera images.



Adjusting Transmitted Light Intensity

1. Press and hold the brightness control knob and the SET button for 2 seconds to switch the light source controlled by the knob (toggle between transmitted and reflected light);
2. Rotate the brightness control knob clockwise to increase brightness or counterclockwise to decrease brightness;
3. Use the light intensity management function: Press and hold the LIM button for 2 seconds to enter setup mode. Rotate the brightness control knob to the desired brightness level and press SET to save the setting for the current objective. Repeat for all objectives, then press the LIM button briefly to save and exit setup mode.



Using Filters or Polarizers (Optional)

1.Insert the filter/polarizer directly into slot A at the transmitted light output. Compatible filter/polarizer sizeØ45mm;

2.Available filters:

45S-LBA:Brown filter, improves observation of bacteria and microorganisms, simulates halogen lamp color temperature;

45S-GR:Green filter, enhances contrast in phase contrast observation and black-and-white imaging;

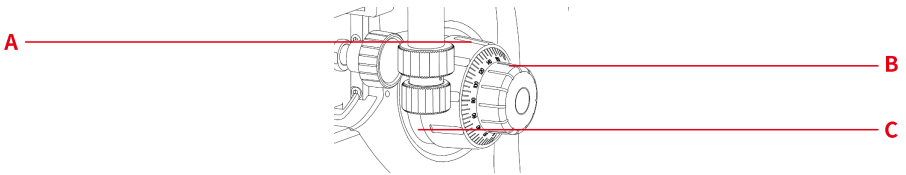
RG-45-POL: Transmitted light polarizer.

Adjusting Focus Mechanism

Coarse Focus Knob (A): Rotate to quickly move the stage for initial focusing;

Fine Focus Knob (B): Rotate for precise focusing at high magnification;

Focus Tension Ring (C):Adjust the resistance of the coarse focus knob (factory preset).



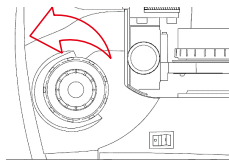
Focusing on the Specimen

1.Rotate the coarse focus knob in the direction indicated by the arrow to raise the stage until the specimen is closest to the objective lens but not touching it. Caution: Avoid physical contact between the specimen and the objective lens to prevent damage;

2.While observing changes in the image through the eyepiece, slowly lower the stage (move it downward) until the outline of the specimen begins to appear;

3.Switch to the fine focus knob. Continue observing the image through the eyepiece while rotating the knob slowly to refine the focus until the image becomes sharp.

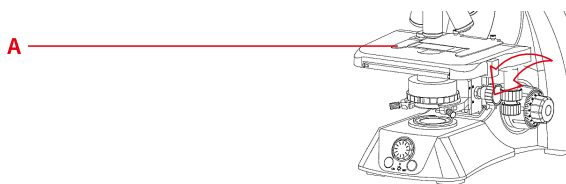
Note: Always focus by moving the specimen downward (away from the objective lens). This minimizes the risk of damaging both the objective lens and the specimen.



Loading and Removing Specimen Slides

1. Rotate the coarse focus knob counterclockwise to lower the stage, creating enough space between the stage and objective;
2. To load a specimen, pull back knob A (in the direction of the arrow) to open the specimen holder. Slide the specimen onto the stage from front to back;
3. Gently release the specimen holder to secure the slide;
4. Before removing the specimen, lower the stage or move the objective out of the light path to avoid damaging the objective.

Note: When using oil immersion or short working distance objectives, exercise caution near the edges of the slide to prevent scratching the objective.



Using Oil Immersion Objectives (Optional)

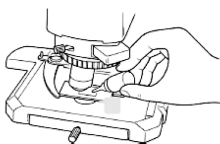
Oil immersion objectives are marked with an “O” or “OIL” in the model description. When using oil immersion objectives, always use Servicebio’s specified immersion oil. Other brands may not achieve the designed optical performance.

1. Switch objectives from low to high magnification, focusing on the specimen at each step;
2. Before rotating the oil immersion objective into the light path, apply a drop of immersion oil to the specimen within the illuminated area;
3. Rotate the nosepiece to bring the oil immersion objective into the light path, then use the fine focus knob to focus on the specimen.

The maximum numerical aperture (NA) indicated on the condenser applies when immersion oil is used between the slide and condenser top surface. Without oil, the NA is approximately 0.9. Immersion oil is required to achieve the maximum NA.

Note: Ensure that the immersion oil is free of air bubbles, as bubbles in the oil may reduce image clarity. To remove bubbles, rotate the objective turret and move the objective lens back and forth several times to agitate the immersion oil and expel the bubbles.

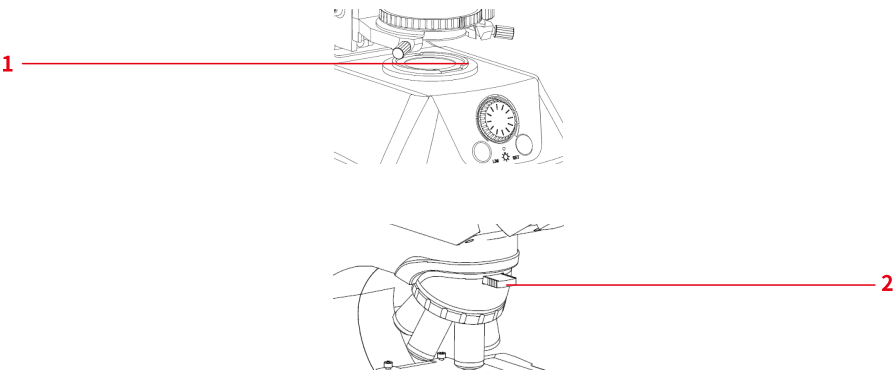
After use, promptly clean residual immersion oil from the objective lens, condenser, and specimen. Use professional lens paper moistened with anhydrous alcohol for wiping. If immersion oil is left uncleaned for extended periods, it may slowly corrode the sealing gaskets on the lens surface, seep into the lens interior causing damage, or contaminate other lenses or specimens, leading to inaccurate observations.



Using Crossed Polarizers (Optional)

For cross-polarized observation, insert the polarizer (RG-45-POL) and analyzer (11555050) into the light path (below the condenser and above the nosepiece, respectively)

- 1.Place the universal transmitted polarizer (RG-45-POL) horizontally into the filter slot at the microscope base's light output, with the text facing up;
- 2.Insert the analyzer (11555050) into the slot above the nosepiece;
- 3.Rotate the polarizer (RG-45-POL) until the field of view becomes darkest, indicating the crossed position.



04 Troubleshooting Common Issues

4.1 Optical System Faults

Symptom	Possible Cause	Solution
No Illumination	1. Power cord plug is not connected to a live outlet 2. Loose power cord connections (at either end) 3. Incorrect light source mode selection	1. Securely connect the power cord to the outlet 2. Check and tighten the power cord connections 3. Press and hold the dimmer knob and SET button for 2 seconds to reselect transmitted or reflected light mode
Dim Illumination	1. Condenser position is too low 2. Aperture diaphragm and field diaphragm are not fully open 3. Light path selector lever of the trinocular tube is in the photo/spectrum mode 4. Dimmer knob or LIM setting issue	1. Raise the condenser position 2. Fully open the aperture and field diaphragms to appropriate positions 3. Switch the light path selector lever of the trinocular tube to the visual observation mode 4. Reset the light intensity and LIM settings
Incomplete Field of View	1. Light path selector lever of the trinocular tube is not aligned correctly, blocking the field 2. Analyzer is not properly installed 3. Objective lens is not aligned in the light path, blocking the field 4. Field diaphragm is not centered 5. Field diaphragm is closed too tightly 6. Dirty optical components (eyepiece, objective,	1. Align the light path selector lever to the correct position (matching the light path) 2. Remove the analyzer or reinstall it properly 3. Rotate the objective lens to align it correctly in the light path 4. Perform field diaphragm centering adjustment 5. Open the field diaphragm fully
Mismatched Left/Right Fields	1. Incorrect interpupillary distance adjustment 2. Improper diopter correction for eye differences 3. Different eyepieces used for left and right eyes	1. Adjust the interpupillary distance until the left and right fields fully overlap 2. Correctly adjust the diopter for each eye individually to achieve sharp focus 3. Use identical eyepieces for both eyes
Glare in Image	1. Aperture diaphragm is closed too tightly 2. Condenser position is too low	1. Adjust the aperture diaphragm according to the objective's numerical aperture

Symptom	Possible Cause	Solution
Image appears white or hazy	1.Using non-Servicebio ECGO optical system objectives 2.Objective is not correctly positioned in the light path 3.Contamination in the optical system (eyepiece, objective, condenser, light exit) 4.Not using immersion oil or using non-Servicebio specified immersion oil for oil objectives 5.Air bubbles in the immersion oil 6.Specimen placed upside down 7.Cover glass thickness does not match the objective requirements 8. Immersion oil has contaminated the dry objective's top lens 9. Immersion oil was not wiped off the specimen after using an oil immersion objective	1.Replace with Servicebio ECGO optical system objectives 2.Rotate the nosepiece to correctly position the objective in the light path 3.Clean and maintain the optical components 4.Use Servicebio-specified immersion oil 5.Remove air bubbles 6.Place the specimen with the cover glass facing the objective 7.Use an objective compatible with the cover glass thickness or replace the cover glass 8.Thoroughly clean the top lens of the objective 9.Wipe off the immersion oil from the specimen
Image cannot be focused	1.Invert the front and back of the specimen when placing it 2.Immersion oil has contaminated the dry objective's top lens 3.Immersion oil was not wiped off the specimen after using an oil immersion objective	1. Place the specimen with the cover glass facing the objective 2. Thoroughly clean the top lens of the objective 3. Wipe off the immersion oil from the specimen
Image is partially clear and partially blurry	1.Objective is loose or not properly installed 2.Stage is loose or not installed level 3.Specimen is not placed level on the stage	1.Reinstall and tighten the objective 2.Properly install the stage 3.Place the specimen level on the stage 4.Return to the manufacturer for repair
Image shifts when out of focus	1.Objective is loose or not properly installed 2.Aperture diaphragm is not fully open or not centered	1.Reinstall and tighten the objective 2.Open the aperture diaphragm fully and perform
Image color temperature is too high or appears white	1.LED light source color temperature is too high 2.LED light source color temperature is too low	1.Insert an LBA brown filter to reduce the color temperature 2.Remove the LBA brown filter or install an LBD blue filter to increase the color temperature

4.2 Electrical System Faults

Symptom	Possible Cause	Solution
Indicator Light Does Not Illuminate	1.Power cord plug is not connected to a live outlet 2.Loose power cord connections (at either end)	1.Securely connect the power cord to the power outlet 2.Check and tighten the power cord connections
Light Source Turns Off Automatically	1.Unstable cable connection	1.Firmly reconnect the cable
Dimmer Knob Is Inoperative	1.Light Intensity Management (LIM) preset function is enabled	1.Disable the LIM preset function
Objective Turret Port Recognition Error	1.Objectives were not installed in ascending order of port positions 2.Non-original power adapter is used 3.Incorrect software settings or control program mismatch with port count	1.Install objectives in ascending order based on their port positions 2.Replace with the original manufacturer-provided power adapter 3.Select the control program corresponding to the

4.3 Mechanical Device Faults

Symptom	Possible Cause	Solution
Focus knobs feel too stiff	1.The tension adjustment ring on the coarse focus knob is too tight	1.Loosen the tension adjustment ring until the knobs feel comfortable

Symptom	Possible Cause	Solution
Stage automatically slips down	1.The tension adjustment ring on the coarse focus knob is too loose	1.Tighten the tension adjustment ring until the knobs feel comfortable
Specimen cannot be focused	1.The stage position is too low 2.The specimen is placed upside down	1.Raise the stage position 2.Place the specimen with the cover glass facing the objective
Stage cannot be lowered	1.The condenser is positioned too low, obstructing the stage	1.Raise the condenser position
Objective hits the specimen during focusing	1.The specimen is placed upside down	1.Place the specimen with the cover glass facing the objective
Image shakes when touching the stage	1.The stage is not securely fixed	1.Securely fix the stage
Reduced XY movement range	1.The stage specimen holder guide rail is misaligned	1.Manually slide the specimen holder guide rail to the start and end positions to reset the starting point

05 Cleaning, Maintenance, and Care

5.1 Cleaning

Note: Do not touch the lens surface with your hands. First, try using a blower bulb to remove dust particles from the surface. Next, use lint-free lens paper, a lens cleaning cloth, or a professional lens cleaning wipe to gently clean the lens. Only use approved lens cleaning solutions. For disinfection, you may use 75% ethanol to wipe the surface.

Note: Do not open the equipment casing.

5.2 Maintenance and Care

- 1.The instrument should be used and stored in a cool, dry, dust-free, vibration-free environment, free from acid or alkali vapors and any corrosive gases;
- 2.Normal working conditions for the instrument: Indoor temperature: 0°C to 40°C; Maximum relative humidity: 85%;
- 3.When the instrument is not in use, disconnect the power supply, cover it with a dust cover, and store it in a dry, cool place;
- 4.Regularly inspect the instrument;
- 5.If maintenance or repair is required, stop using the device;
- 6.Only the manufacturer or its authorized agents should inspect or provide any replacement parts.

Note: To maintain the instrument's performance, regular inspections are recommended. If any malfunction is detected and requires repair, please contact our company.

06 Technical Specifications

6.1 Environmental Specifications

Operating Temperature	10°C~40°C
Relative Humidity	≤85%
Operating Atmospheric Pressure	76kPa~106kPa
Storage and Transportation Temperature	-20°C~55°C
Storage and Transportation Humidity	Maximum 85% RH (no condensation)

6.2 Power Supply Specifications

Main Unit Input	12V, 2.1A
Light Box Input	5V, 2A

6.3 Key Technical Parameters

Bulb Power	10W/5V
Bulb Lifespan	60,000 hours (approximately 25,000 hours at 50% light decay)
Operating Voltage	DC 12V
Eyepiece Magnification	10×
Objective Magnification	4×、10×、20×、40×
Observation Method	Brightfield

07 Electromagnetic Compatibility

Note: This product complies with the electromagnetic compatibility requirements of the GB/T18268.1 standard.

Users should install and use the product according to the electromagnetic compatibility (EMC) information provided in the accompanying documentation.

This product meets the radiation and immunity requirements described in the GB/T18268.1 series. Before using the product, assess the electromagnetic environment. Do not use the product near strong electromagnetic emission sources to avoid interference with proper operation.

Guidance and Manufacturer's Declaration – Electromagnetic Emissions

The biological microscope is intended for use in the electromagnetic environment specified below. The purchaser or user should ensure that it is used in such an environment

Emission Test	Compliance	Electromagnetic Environment – Guidance
Conducted Emissions GB 4824	Group 1	The biological microscope has low RF emissions and is unlikely to cause interference with nearby electronic equipment.
Conducted Emissions GB 4824	Class B	
Harmonic Emissions GB 17625.1	Class A	The biological microscope is suitable for use in all facilities, including domestic establishments and those directly connected to the public low-voltage power supply network.
Voltage Fluctuations/ Flicker Emissions GB 17625.2	Compliant	

Guidance and Manufacturer's Declaration – Electromagnetic Immunity

The biological microscope is intended for use in the electromagnetic environment specified below. The purchaser or user should ensure that it is used in such an environment

Immunity Tests	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrostatic Discharge (ESD) GB/T 17626.2	± 6 kV contact discharge ± 8 kV air discharge	± 6 kV contact discharge ± 8 kV air discharge	The floor should be made of wood, concrete, or ceramic tiles. If the floor is covered with synthetic material, the relative humidity should be at least 30%
Electrical Fast Transient/Burst GB/T 17626.4	±2kV line-to-line ±1kV for input/output lines	±2kV line-to-line ±1kV for input/output lines	The mains power supply should be of a quality typically used in commercial or hospital environments
Surge GB/T 17626.5	±1 kV line-to-line ±2 kV line-to-ground	±1 kV line-to-line ±2 kV line-to-ground	The mains power supply should be of a quality typically used in commercial or hospital environments
Voltage Dips, Short Interruptions, and Voltage Variations GB/T 17626.11	<5 % UT for 0.5 cycle (On UT, >95% voltage sags) 40 % UT for 5 cycle (On UT, 60% voltage sags) 70 % Ut for 25 cycle (On UT, 35% voltage sags) <5 % UT for 5s (On UT, >95% voltage sags)	<5 % UT for 0.5 cycle (On UT, >95% voltage sags) 40 % UT for 5 cycle (On UT, 60% voltage sags) 70 % Ut for 25 cycle (On UT, 35% voltage sags) <5 % UT for 5s (On UT, >95% voltage sags)	If the user requires continuous operation during power interruptions, it is recommended to use an uninterruptible power supply or battery power
Power Frequency Magnetic Field (50/60Hz) GB/T 17626.8	3A/m	3A/m, 50/60Hz	The power frequency magnetic field should be at levels typical of commercial or hospital environments

Note: UT refers to the AC mains voltage prior to the application of the test voltage.

Guidance and Manufacturer's Declaration – Electromagnetic Immunity

The biological microscope is intended for use in the electromagnetic environment specified below. The purchaser or user should ensure that it is used in such an environment

Immunity Tests	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
RF Conducted Immunity GB/T 17626.6	3 V(rms) 150 kHz~80 Mhz	3V(rms)	Portable and mobile RF communication equipment should not be used closer to any part of the instrument, including cables, than the recommended isolation distance. This distance is calculated by a formula corresponding to the transmitter frequency. The recommended separation distance d is calculated using the following formulas: $d=1.2\sqrt{P}$ $d=1.2\sqrt{P} \text{ 80 MHz~800 MHz}$ $d=2.3\sqrt{P} \text{ 800 MHz~2.5 GHz:}$ P is the maximum rated output power of the transmitter in watts (W), as provided by the transmitter manufacturer; d is the recommended separation distance in meters (m). Note: Ensure that the field strength of fixed RF transmitters is below the compliance level in each frequency range to avoid interference. Interference may occur in the vicinity of devices marked with the following symbols. 
RF Radiated Immunity GB/T 17626.3	3V/m 80 MHz~2.5 GHz	3V/m	

For frequencies at 80 MHz and 800 MHz, the formula for the higher frequency range should be used;

These guidelines may not apply to all situations, as electromagnetic propagation is influenced by absorption and reflection from buildings, objects, and human bodies.

A. Fixed TransmittersFixed transmitters, such as base stations for wireless (cellular/cordless) phones and land mobile radios, amateur radios, AM and FM radio broadcasts, and television broadcasts, have field strengths that cannot be accurately predicted theoretically. To assess the electromagnetic environment of fixed RF transmitters, an electromagnetic field survey should be conducted. If the measured field strength at the instrument's location exceeds the applicable RF compliance level mentioned above, the instrument should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the instrument;

B. Frequency Range 150 kHz to 80 MHzThe field strength should be below 3 V/m across the entire frequency range of 150 kHz to 80 MHz.

Recommended Separation Distance Between Portable/Mobile RF Communication Equipment and the Biological Microscope

The biological microscope is intended for use in an electromagnetic environment where RF radiation disturbances are controlled. Based on the maximum rated output power of the communication equipment, the purchaser or user can prevent electromagnetic interference by maintaining the minimum recommended distance between portable/mobile RF communication equipment (transmitters) and the instrument, as shown below

Transmitter's Rated Transmitter's Maximum Rated Output Power (W)	Separation Distance (m) for Different Transmitter Frequencies		
	150kHz~80MHz $d=1.2\sqrt{P}$	80MHz~800MHz $d=1.2\sqrt{P}$	800MHz~2.5GHz $d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitter frequencies not listed in the table, the recommended separation distance d , in meters (m), can be determined using the formula in the corresponding transmitter frequency column, where P is the transmitter's maximum rated output power in watts (W), as provided by the transmitter manufacturer.

Note 1: For frequencies at 80 MHz and 800 MHz, the formula for the higher frequency range should be used;

Note 2: These guidelines may not apply to all situations, as electromagnetic propagation is influenced by absorption and reflection from buildings, objects, and human bodies.



Wuhan Servicebio Technology Co., Ltd.



027-5111-3188



www.servicebio.com



5th Floor, 22 Building, Biopark, No. 388 Gaoxin 2nd Road, East Lake High-tech Developing Zone, Wuhan, Hubei, China