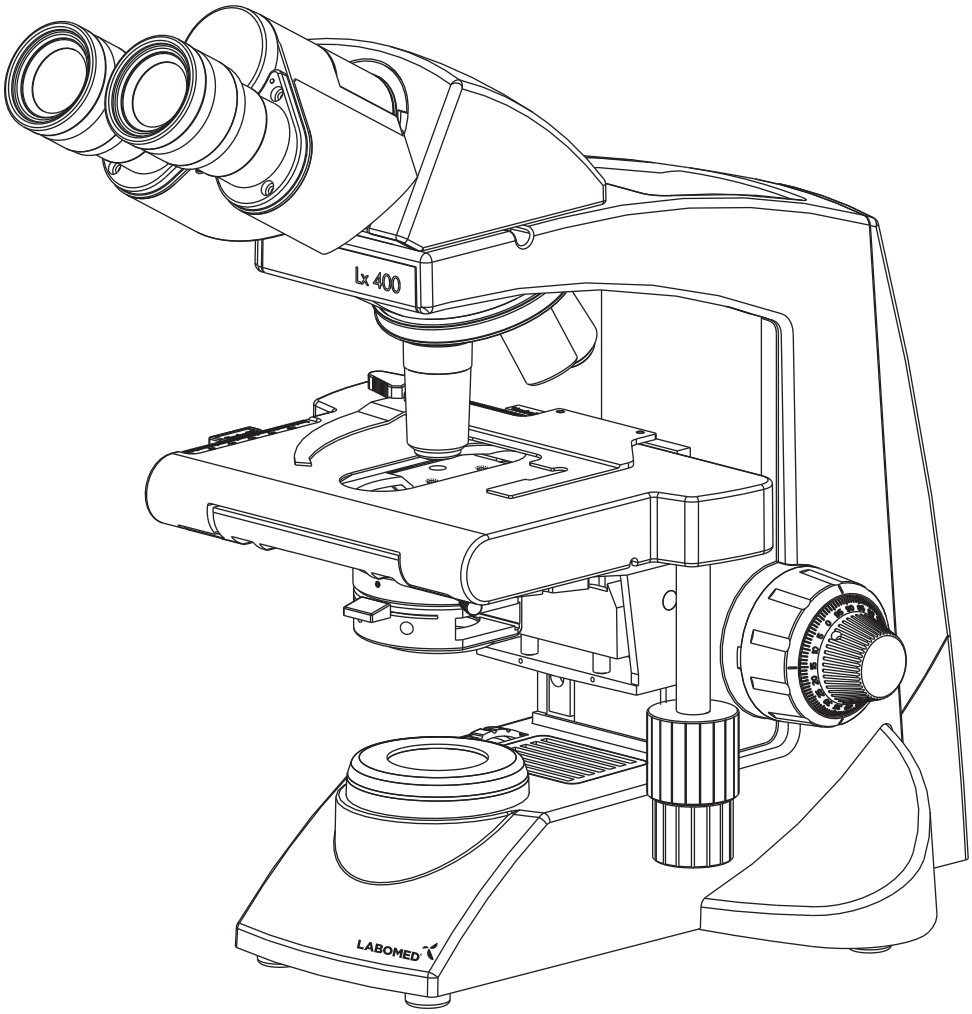
LABOMED
ideas for vision

Lx 400
Research Microscopy

User Manual



To ensure correct use of this instrument and to avoid injury during operation, read this manual completely before use.

Part No.:
9126000-795
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1 INTRODUCTION

The Lx 400 is a research microscope that combines a modern design with the latest optical and mechanical engineering. Designed for professionals and clinicians alike, it offers many features and functions for a wide range of applications. Its main benefits are:

- The 360° rotatable binocular body is inclined at 30° and has interpupillary distance (IPD) adjustment for extra clarity and contrast.
- The pressure die-cast stand has ball-bearing, frictionless side-mounted focusing that prevents any loss of motion.
- The sturdy, modern design provides a high degree of comfort and stability.
- The high-power objectives are spring-loaded to prevent accidental damage to specimen slides.
- The reverse-angle quadruple nosepiece has a comfortable ribbed grip for easy rotation that also protects the turret system against damage. All positions are parcentered and parfocal, ensuring the highest level of accuracy.
- The ball-bearing mechanical stage provides smooth travel over a 78 x 54mm area, with spring-loaded stage clamps that hold the specimen exactly where you want it. A vernier scale with 0.1mm divisions allows accurate location of the specimen area.
- High-power illumination is supplied by our well-crafted universal power supply, which operates on any 100V-240V AC input. The LED configuration operates from a built-in rechargeable battery, P/N 9135000-902, which, when plugged in, draws power from a universal power supply operating at 100V-240V AC input. This ensures continuous operation even when the supply voltage fluctuates.
- Our LED has an average life of up to 50,000 hours.
- The Lx 400 is equipped with a removable N.A. 1.25 Abbe condenser with a spheric lens for brighter illumination, and an iris diaphragm for better resolution and contrast control.

2 SAFETY INFORMATION

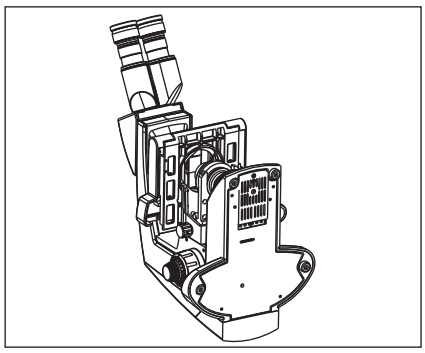


Fig. 1

1. After the microscope has been used to observe a specimen containing bacteria, clean all parts that came in contact with the specimen to prevent infection.
   - Be sure to remove the specimen before moving this product.
   - If the specimen is damaged by incorrect operation, clean all surfaces that may have come in contact with the specimen.
2. To avoid electrical hazards when replacing the LED, set the main switch of the microscope to OFF and disconnect the power cord from the wall outlet beforehand (Fig. 1).

Applicable LED replacement: LED P/N 9135000-901

3. Install the microscope on a sturdy, level table or bench and do not obstruct the air vents in the base of the unit. Do not place the microscope on a flexible surface, as this could block the air vents and cause overheating.
4. Always use the power cord provided by LABOMED. If the proper power cord is not used, the safety performance of the product cannot be warranted.
5. When installing the microscope, route the power cord away from the microscope frame. If the power cord comes in contact with the base of the microscope, it could melt from overexposure to heat.
6. Always make sure that the grounding terminal of the microscope and that of the wall outlet are properly connected. If the unit is not grounded, LABOMED cannot warrant electrical safety.
7. Never allow metal objects to enter the air vents of the microscope frame, as this could result in injury to the user and damage to the microscope.
8. After using the microscope, be sure to disconnect the power cord from the connector socket of the microscope or from the wall outlet.

SAFETY SYMBOLS

The following symbols are found on the microscope. For optimal use, users should understand these symbols and always use the equipment as prescribed.

Symbol	Explanation
	This surface tends to heat up and must not be touched until the system has cooled down completely.
	Before use, read the instruction manual carefully. Improper use could result in injury to the user and/or damage to the equipment.
	Warning: risk of electric shock.
|	Main switch is ON.
○	Main switch is OFF.

Caution

If the microscope is used in a manner not specified in this manual, the safety of the user may not be warranted, and the equipment may be damaged. Always use the equipment as described in this instruction manual.

1 GETTING STARTED

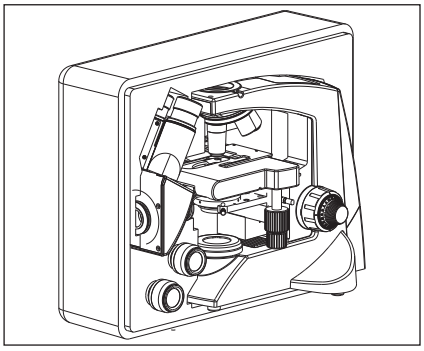


Fig. 2

1. A microscope is a precision instrument with delicate glass components. Please handle it with care.
2. Do not use the microscope where it is exposed to direct sunlight, high temperature, humidity, dust or vibration. (For the operating conditions, see chapter 15, “SPECIFICATIONS”.)
3. The microscope is cooled by natural convection. Be sure to leave enough space (10cm or more) around the body when installing the unit.
4. An arm handle is provided for carrying the microscope.

To prevent damage, do not hold the microscope by the stage or the observation tube.

Be sure to remove the specimen from the stage clip when transporting the unit, to avoid damage to the specimen slide.

2 MAINTENANCE AND STORAGE

1. Clean all glass components by wiping them gently with the cleaning cloth provided. To remove fingerprints or oil smudges, wipe with the cleaning cloth slightly moistened with a mixture of petroleum ether (85%) and isopropanol (15%).

Since solvents such as petroleum ether and isopropanol are highly flammable, they must be handled carefully. Keep these chemicals away from open flames and potential sources of electrical sparks, for example electrical equipment that is being switched “ON” or “OFF”. Always use these chemicals only in a well-ventilated room.

2. Do not use organic solvents to clean microscope components other than the glass components. To clean non-glass components, use a lint-free, soft cloth slightly moistened with a diluted neutral detergent.
3. Do not disassemble any part of the microscope, as this could result in malfunction or reduced performance.

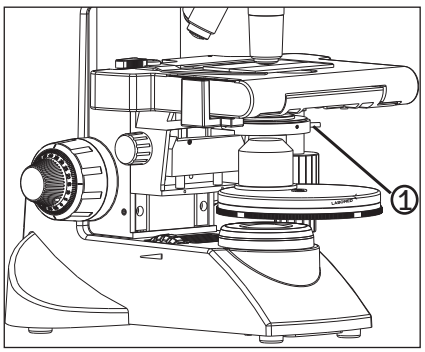


Fig. 3

4. When the microscope is not in use, make sure that the frame has cooled down fully before storing the unit in a dry cabinet or covering it with the dust cover (provided).
5. To clean the condenser/phase turret, fully loosen the securing screw (1) with the 1.5mm Allen wrench and remove the condenser first. Then wipe the front lens of the condenser with optical cleaning solution (the mixture suggested above) and lens tissue. To reattach the condenser, place it in its seat, tighten the securing thumb screw and raise the condenser bracket to the desired position.
6. Be sure to observe your local rules and regulations for product disposal.

3 CARE, MAINTENANCE AND SERVICING

Your microscope has been engineered for a long and safe operating life with the least amount of maintenance. In general, routine maintenance is limited to keeping the working parts of the microscope lubricated and the optics clean. Even slight contamination impairs image quality. To protect the internal optics from dust, never leave the system without the objectives, binocular tube and eyepieces. After use, always store optical components and accessories that are not in use in dust-free cases.

Clean the external surfaces of optical components as required.

Never spray fumigants directly on the instrument or optical surfaces.

Optical cleaning

1. The objectives have been adjusted for a tight fit to prevent any damage during transportation. To remove an objective, rotate it counterclockwise while gripping it with a rubber sheet or similar to avoid slipping.
2. To clean the lens surfaces, remove dust with a soft brush or gauze (compressed-air dust cans are ideal). To remove fingerprints or grease, use a soft cotton cloth or lens tissue lightly moistened with cleaning solution (85% petroleum ether and 15% isopropanol). For cleaning the optics, use methanol. Use sufficient caution when handling methanol. Place the objectives and/or eyepieces on a dust-free surface (e.g. aluminum foil). All other optical components to be cleaned should be as accessible as possible.
3. Blow all loose dust particles away with a dust blower.
4. Remove all water-soluble dirt with distilled water. If this is unsuccessful, repeat with a solution of diluted liquid hand soap. Remove any remaining residue with a dry cotton swab.
5. To remove oil, first use a solution of diluted liquid hand soap. If this does not produce a satisfactory result, repeat the cleaning with a solvent (optical cleaning solution: 85% petroleum ether and 15% isopropanol).
6. Grease must always be removed with a solvent.
7. Clean with a spiral motion from the center to the rim. Never wipe with zig-zag movements, as this will only spread the dirt. On larger optical surfaces (e.g. tube lenses), the spiral motion first goes from the rim to the middle and is then followed by a center-to-rim cleaning motion. Several spiral wipes are normally recommended.

We recommend pure, volatile petroleum ether or optical cleaning solution as described above.



Zig-zag motion (X)

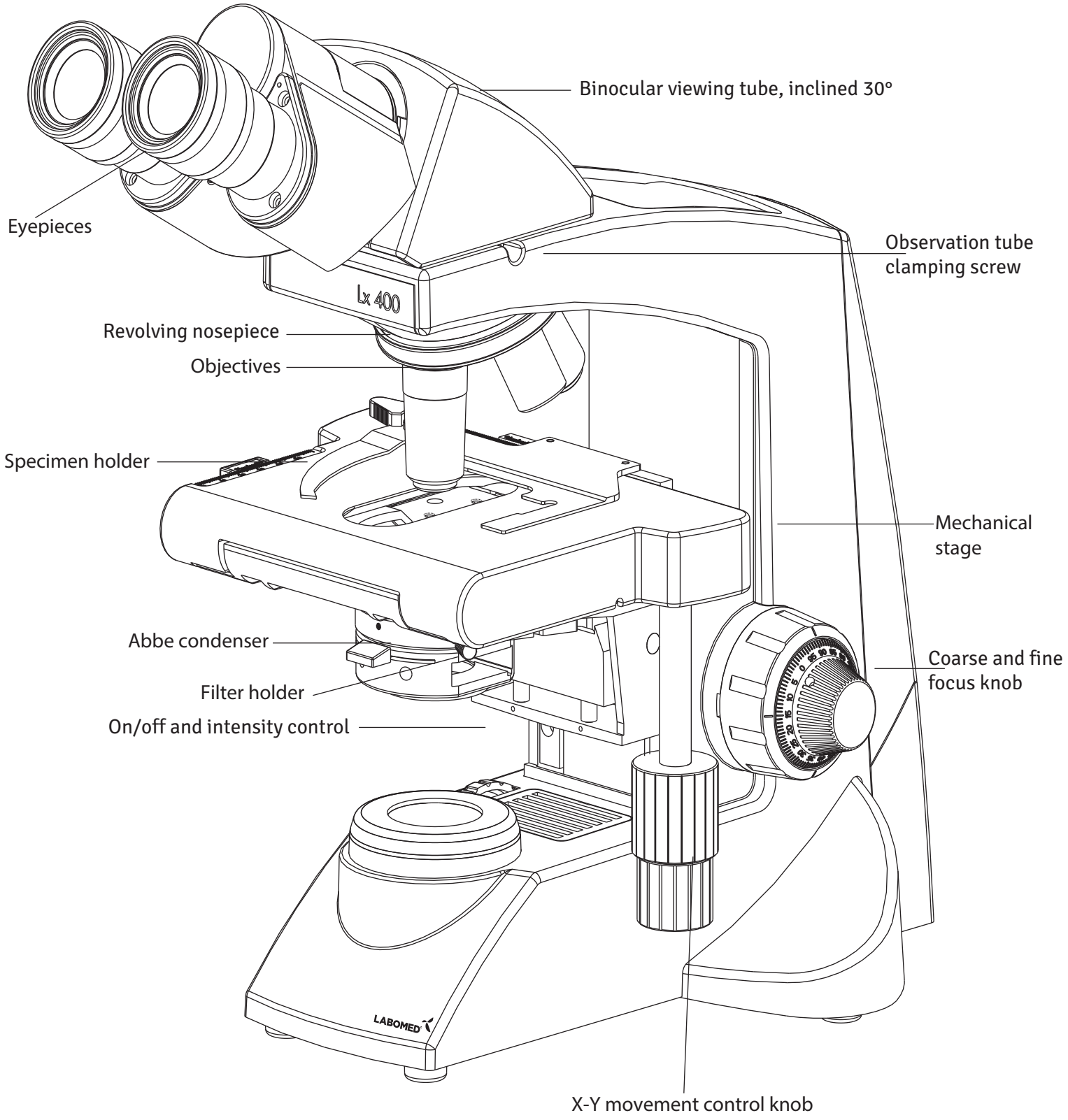


Spiral motion (✓)

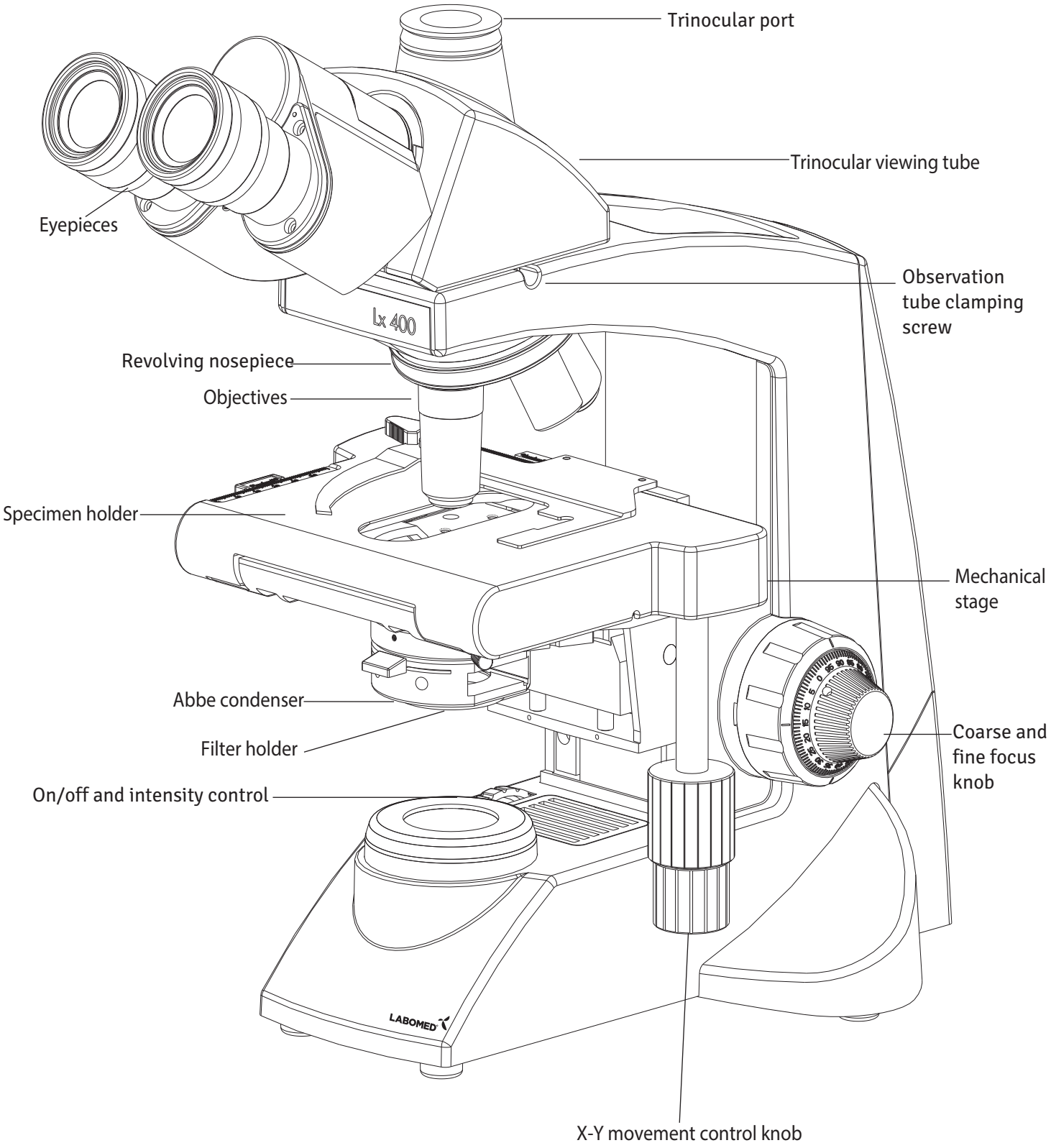
Wipe with a spiral movement. Do not use a zig-zag motion!

Cleaning painted surfaces

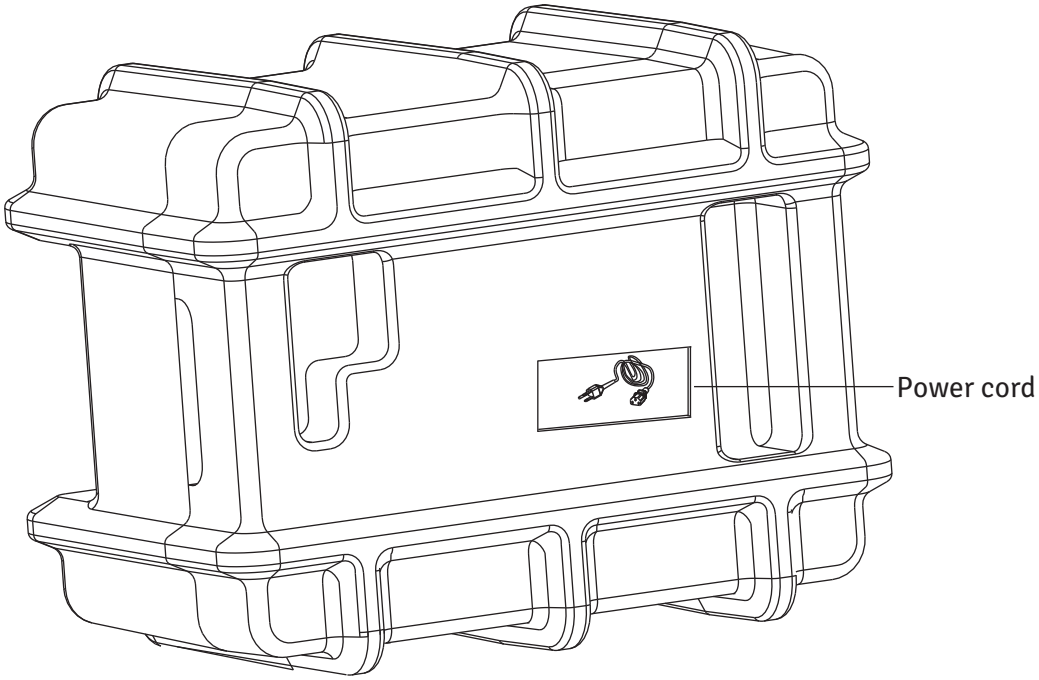
Do not use any organic solvent (e.g. thinner, xylene, ether, alcohol) to clean the painted surfaces of the instrument. Painted surfaces can be cleaned with a very lightly moistened microfiber cloth. Loose dust and dirt can be removed with a soft-hair brush used exclusively for this purpose.

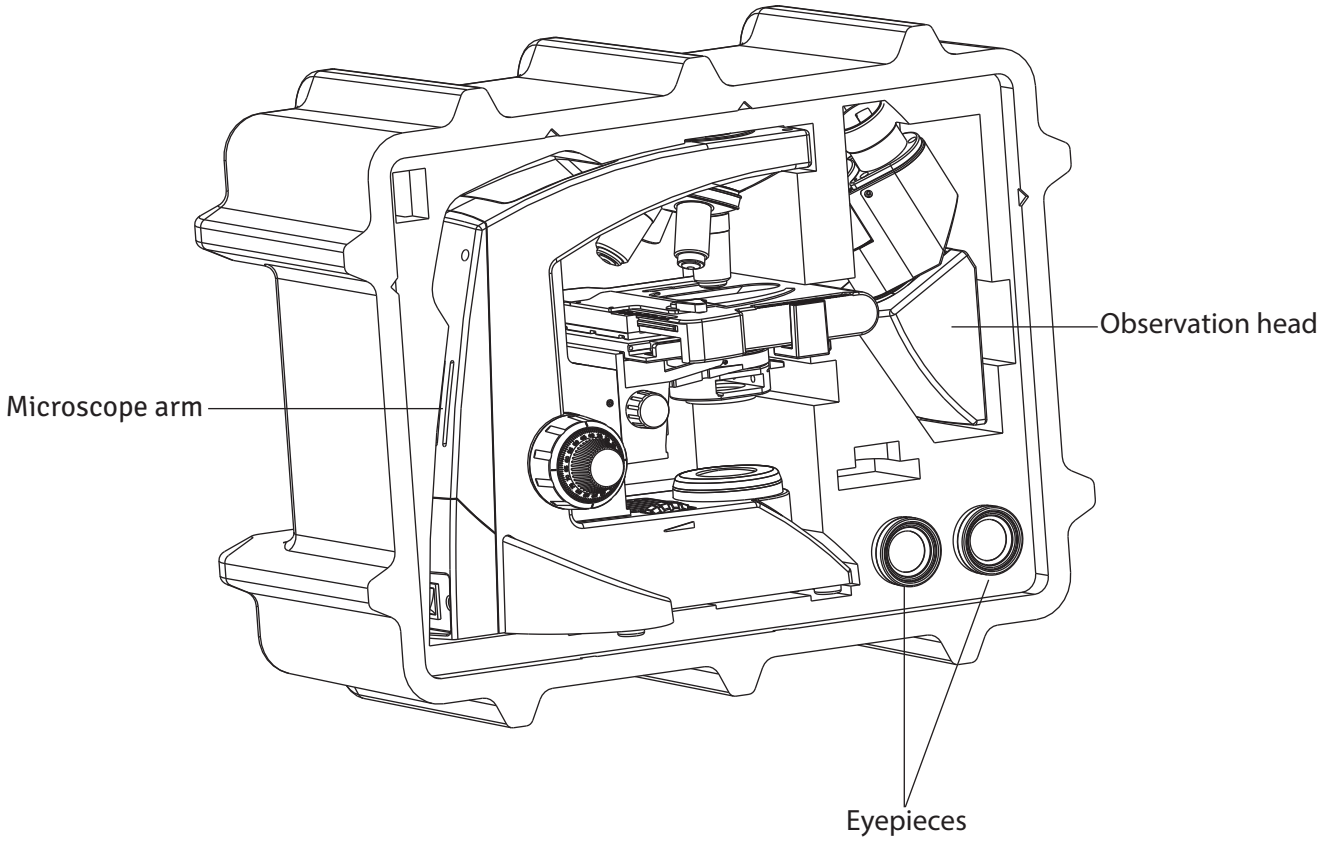

Binocular viewing tube, inclined 30°
Eyepieces
Observation tube clamping screw
Lx 400
Revolving nosepiece
Objectives
Specimen holder
Mechanical stage
Abbe condenser
Coarse and fine focus knob
Filter holder
On/off and intensity control
LABOMED
X-Y movement control knob

4 Lx 400 TRINOCULAR



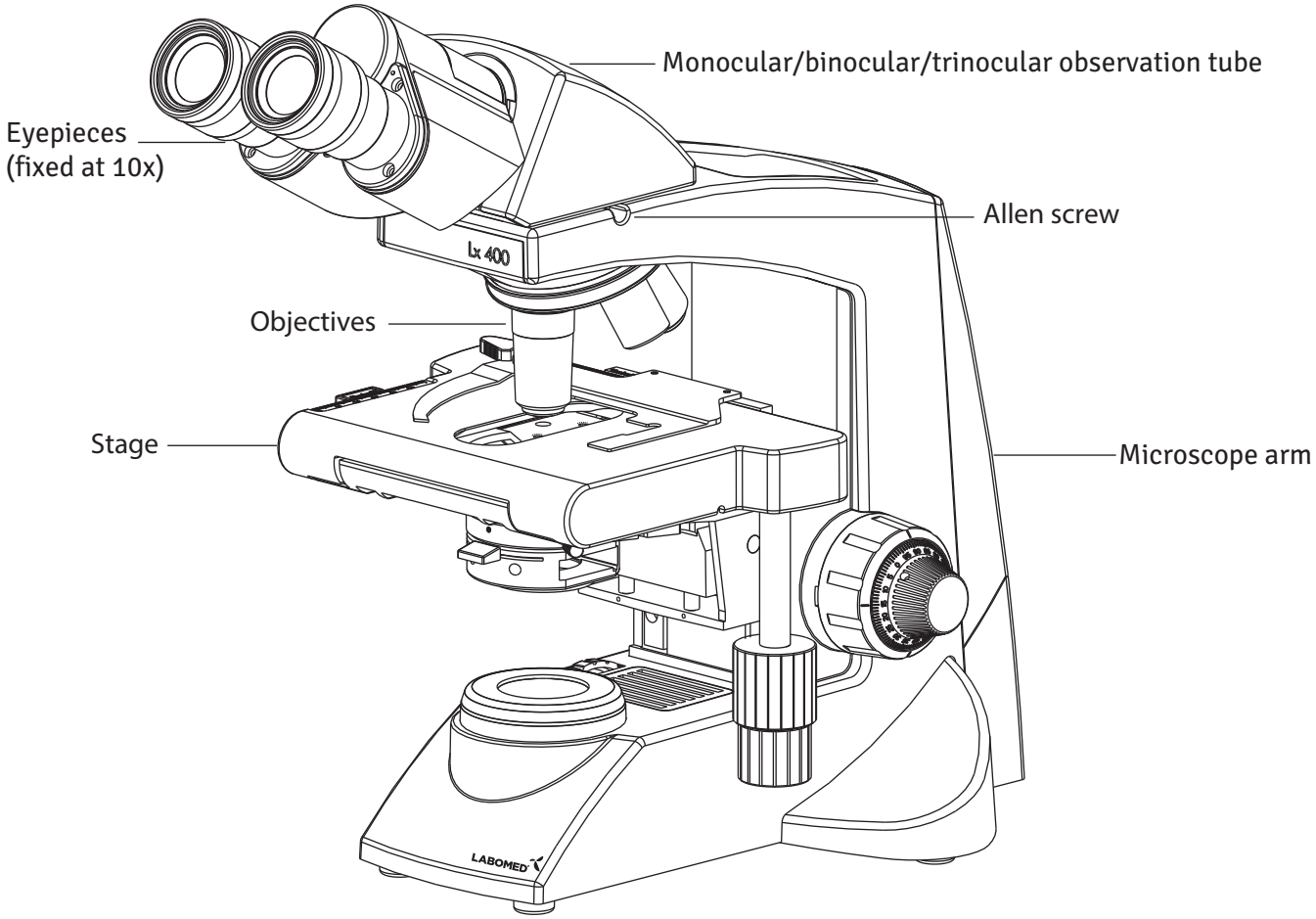
5 UNPACKING YOUR MICROSCOPE

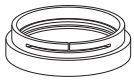




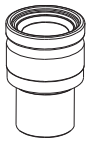
6 STANDARD COMPONENTS

After removing your microscope from its packaging, make sure that all of the following contents are present. Please note that the contents of your microscope may vary, because the optional configuration, contrast method or viewing body you ordered may differ from the standard configuration shown here.





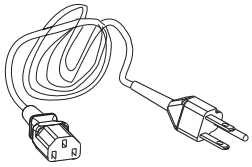
Daylight (blue) filter



Paired eyepieces



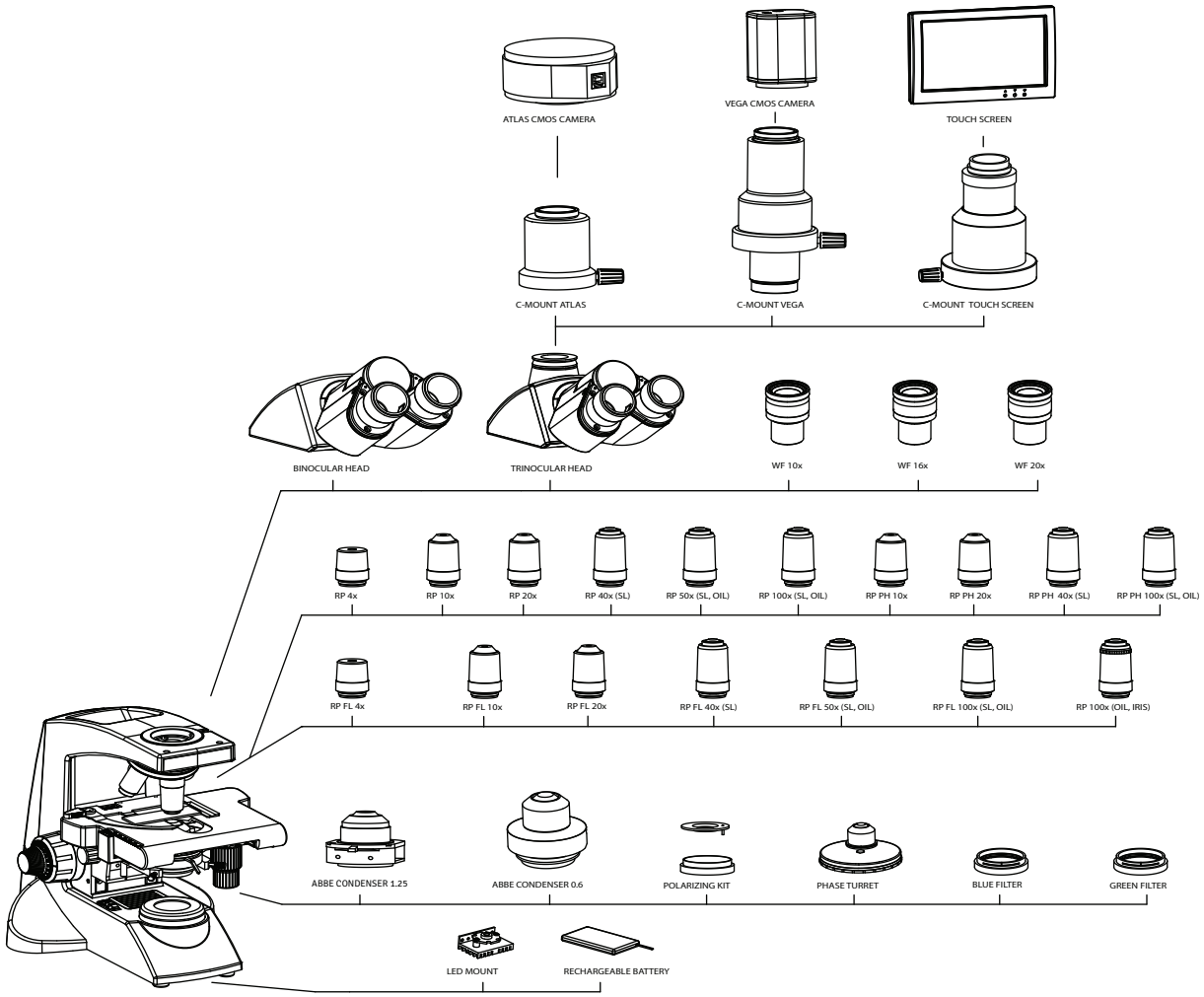
Allen wrench, 3mm



Power cord

7 OPTIONAL ACCESSORIES

SYSTEM DIAGRAM OF OPTIONAL ACCESSORIES



INSTALLATION AND OPERATION OF OPTIONAL ACCESSORIES

1 CAMERA MODULE SYSTEM

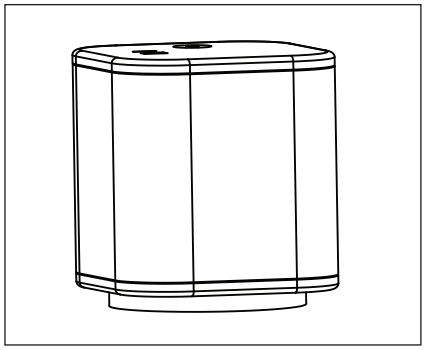


Fig. 4

1. Mount the 1/2” video adapter on the trinocular observation head.
2. Mount the camera module system on the video adapter.

2 OPTIONAL EYEPIECES

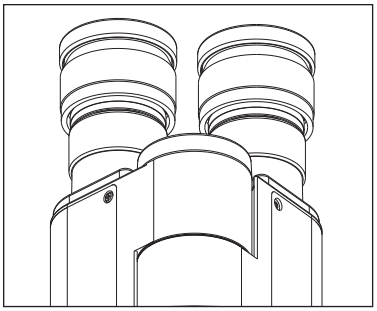


Fig. 5

10x eyepieces are provided. To replace them:
1. Pull the 10x eyepieces out of the eyepiece tubes of the observation head.
2. Insert the desired eyepieces in the empty eyepiece tubes.

3 PHASE TURRET

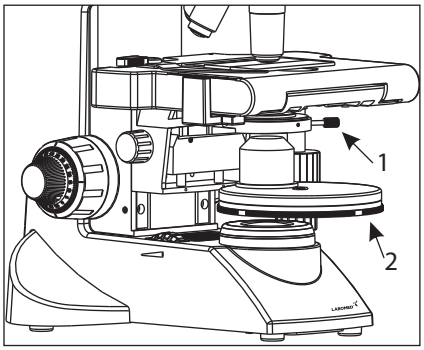


Fig. 6

1. Remove the condenser by loosening the screw (1) on the right side of the condenser bracket with the 1.5mm Allen wrench, as shown in Fig. 6.
2. Place the phase annulus turret in the position from which the condenser was removed.
3. Secure it again with the screw (1). The phase turret can be set to any phase annulus (10x, 20x, 40x and 100x) by turning the thumb wheel (2) to the desired position. The thumb wheel also has an '0' setting for brightfield use.

Note: Refer to the user manual provided with the phase contrast kit for centering and alignment.

4 INSTALLING THE KOEHLER ILLUMINATION KIT

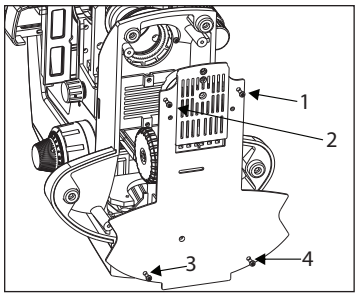


Fig. 7

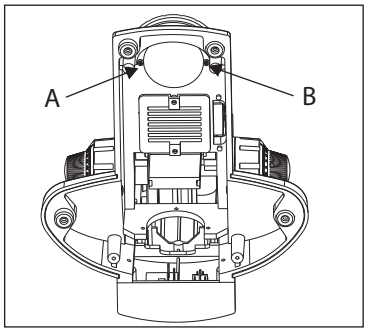


Fig. 8

Procedure for the Koehler illumination kit (Fig. 7 to 11)
1. Lay the microscope on its right side on a clean surface so that the microscope base is exposed.
2. Using a screwdriver, remove the four screws (1 to 4) shown in Fig. 7 to open the base of the microscope.
3. Remove the two screws (A) and (B) shown in Fig. 8 to open the illumination mount, and replace it with the Koehler mount.

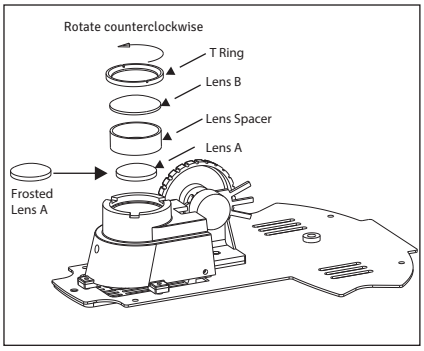


Fig. 9

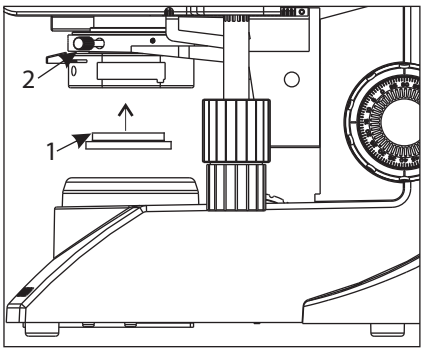


Fig. 10

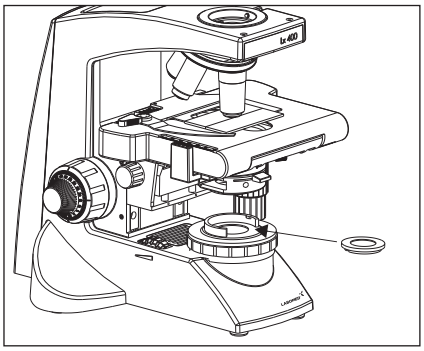


Fig. 11

4. Open the illumination assembly by rotating the T ring (Fig. 9). Replace lens B with the frosted lens provided with the Koehler kit. Secure the lens assembly again.
5. Close the base cover with the screws.
6. Replace the blue filter with the D lens. See Fig. 10.
7. Install the new blue filter on the Koehler mount (Fig. 11).

CAUTION: The flat surface of lens A and lens B must face downward.

8 INITIAL SETUP

1 OBJECTIVES

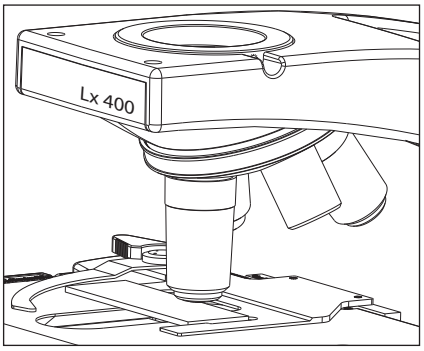


Fig. 12

The objectives are factory set. They are parcentered and parfocalized during assembly.
All objectives have been secured for a tight fit to prevent them from coming loose during transit. To remove an objective, rotate it counterclockwise while holding it with a rubber grip to avoid slipping.

2 OBSERVATION HEAD

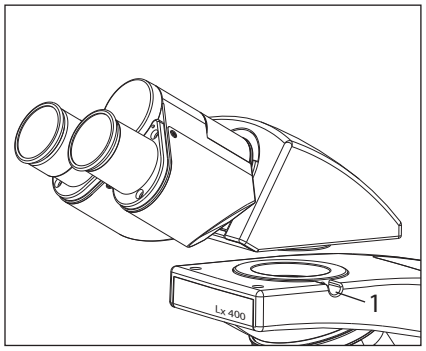


Fig. 13

Install the observation head as follows:
1. Using the 3mm Allen wrench (provided), loosen the head locking screw (1) and remove the dust caps from the dovetail cavity and from the dovetail of the observation head.
2. Mount the observation head by engaging the dovetail at the bottom of the head in the dovetail cavity of the microscope arm.
3. Position the observation head as desired, then tighten the head locking screw (1). See Fig. 13.

3 EYEPIECES

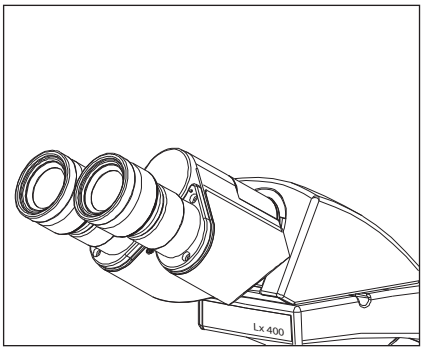


Fig. 14

Insert the eyepieces into the eyepiece tubes of the observation head as follows:
1. Remove the protective caps from the observation tube.
2. Insert the 10x eyepieces into the eyepiece sleeves and tighten the clamping screw (1) with the 1.2mm Allen wrench. See Fig. 14.

9 ASSEMBLY

Each standard set is assembled simply by attaching the filter and power cord.

1 PROCEDURE FOR LED REPLACEMENT

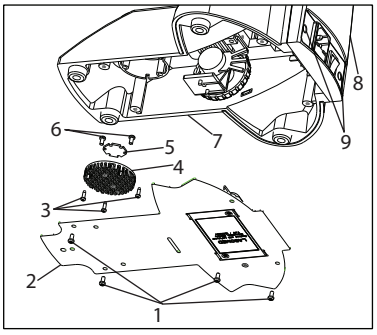


Fig. 16

1. Screws SS 658
2. Base plate 9126100-301
3. Heat shield screws SS 714
4. Heat shield 9135000-524
5. Star LED 9135000-901
6. LED screws SS 658
7. Stand
8. Back cover plate 9126000-102
9. Electric panel 9126000-103
10. Decorative cap 8123000-202

Figure 16

1. Pull out the two decorative caps (9) from the back cover plate.
2. Using a Phillips screwdriver, remove the two screws (9) to detach the back cover plate from the stand.
3. Lay the microscope on its back on a clean surface to expose the base plate.
4. Using a Phillips screwdriver, remove the four screws (1) to open the bottom plate of the microscope.
5. Cut the tie holding the LED wire and detach the LED wire connector from the PCB mounted on the back cover plate.
6. Detach the heat shield from the critical mount by removing the 3 screws (3) with a Phillips screwdriver.
7. Detach the LED from the heat shield by loosening the 2 screws (6).
8. Fit the new LED on the heat shield and connect the wires to the PCB.
9. Reverse steps 6 to 1 to complete the process.

Applicable LED replacement: LED P/N 9135000-901

2 PROCEDURE FOR BATTERY REPLACEMENT

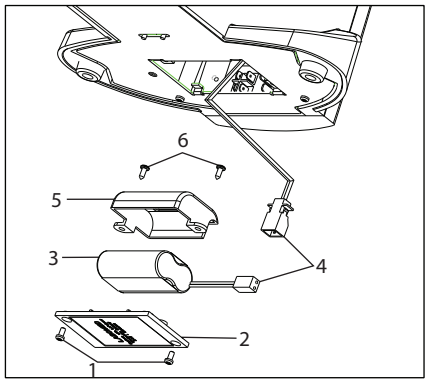


Fig. 17

1. Battery cover screws, bottom SS 658
2. Battery cover 9135100-204
3. Battery 9135000-903
4. Cable clamp EL-488
5. Battery clamp X54383
6. Battery clamp screws SS 658

Figure 17

1. Lay the microscope on its back cover on a clean surface to expose the base plate.
2. Using a Phillips screwdriver, remove the four screws (1) to open the battery cover on the bottom plate.
3. Detach the connector of the connecting wires (4).
4. Remove the two screws (6) on the battery clamp with a Phillips screwdriver.
5. Replace the existing battery with a new battery from LABOMED (see the part number below).
6. Reverse steps 5 to 1 to complete the process.

Applicable battery replacement: battery P/N 9135000-903

3 MOUNTING THE DAYLIGHT (BLUE) FILTER

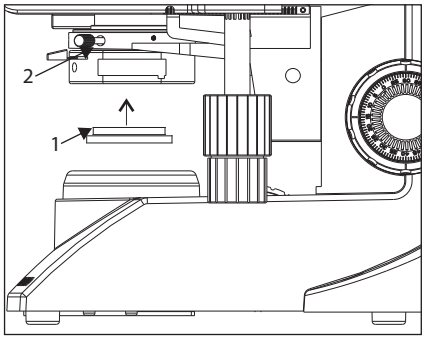


Fig. 18

This filter changes the color of the observation light to a natural daylight color.

- Fit the filter (1) into the bottom of the condenser (2) until it clicks into place (Fig. 18).

4 INSTALLING OR REPLACING THE FUSE

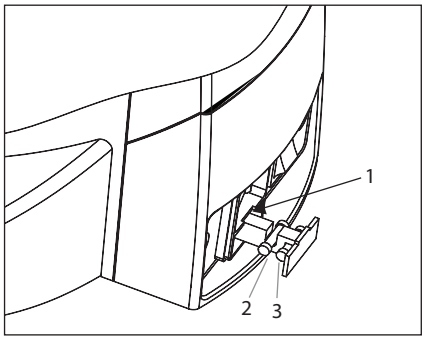


Fig. 19

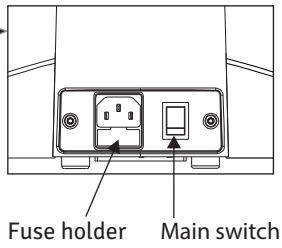
Before replacing the fuse, remove any parts that may drop, such as the filter and the specimen, from the microscope frame. Turn the microscope around so that the AC inlet on its back is visible (Fig. 19).

1. Use a flat-head screwdriver to open the fuse holder (1).
2. The fuse tray comes out with the live fuse (2) and the spare fuse (3). Do not pull the fuse tray out with force; it is locked and will not come out completely.
3. Replace the primary fuse (2) with the spare fuse.
4. Push the fuse tray back in.

Always use the designated fuse. Using a fuse other than those specified by LABOMED may lead to a fire hazard.
CAUTION: Before replacing the fuse, set the main switch to "O" (OFF) and disconnect the power cord from the wall outlet.

10 SUMMARY OF THE BRIGHTFIELD OBSERVATION PROCEDURE

Set the main switch to “ON”.



Place the specimen on the stage.

Engage the required filters if not pre-installed.

Engage the 10x objective in the light path.

Bring the specimen into the light path with the X-Y movement of the stage.

Bring the specimen into focus.

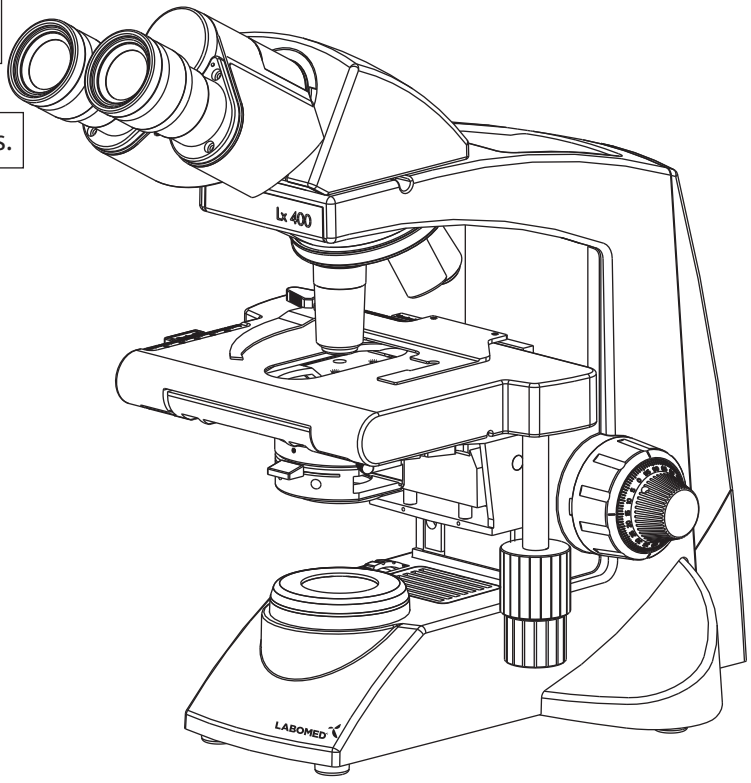
Adjust the observation tube and eyepieces:
adjust the interpupillary distance.
Adjust the diopter setting.

Adjust the aperture iris diaphragm.

Engage the objective to be used in the light path and bring the specimen into focus.

Adjust the brightness.

Observe the specimen.



11 DETAILED OBSERVATION PROCEDURE

1 TURNING ON THE LAMP

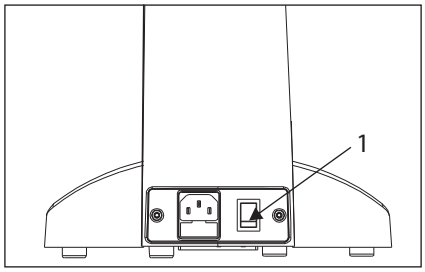


Fig. 20

1. Set the main switch to “I” (ON) as shown in Fig. 20.

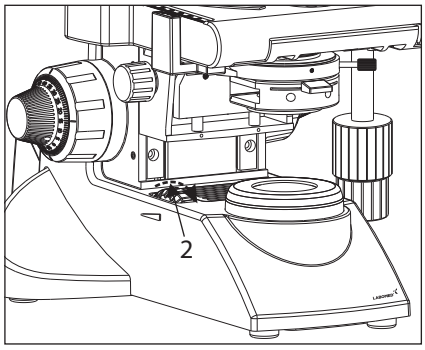


Fig. 21

2. Turning the light intensity knob (Fig. 21) in the direction of the arrow increases the brightness; turning it in the opposite direction decreases the brightness. The intensity bar next to the knob shows the direction of the intensity level.

2 PLACING THE SPECIMEN ON THE STAGE

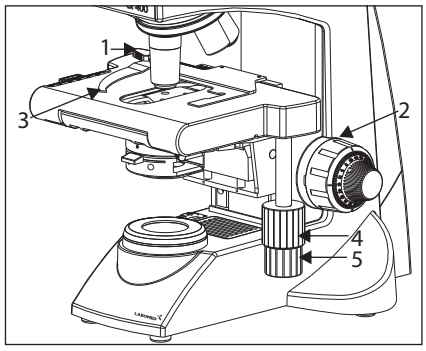


Fig. 22

1. Turn the coarse focus knob (2) counterclockwise to lower the stage fully.
2. Open the bow-shaped lever (3) outward by pulling on the lever handle (1), and place the specimen by sliding the specimen glass plate(s) onto the stage from the front toward the slide seat at the rear.
3. After positioning your specimen slides (2 max.), return the bow-shaped lever (3) gently by slowly releasing the control knob (1).
4. Turning the upper coaxial knob (4), which controls the Y-axis movement, moves the specimen in the vertical direction.
   Turning the lower knob (5) moves the specimen in the X-axis, or horizontal, direction.
   Do not move the specimen holder directly by hand, as this will damage the rotary mechanisms.
   CAUTION: When the specimen holder reaches its stop position, the X/Y knobs become stiff to turn. Stop turning at this point.

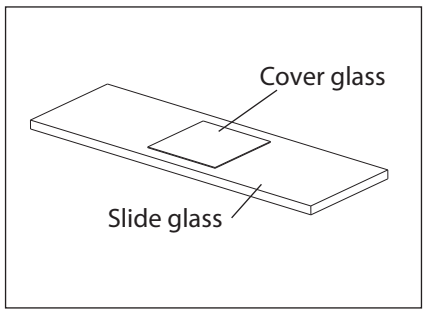


Fig. 23

Cover glass
This is the glass plate placed on the specimen. For optimum optical performance, the cover glass thickness, which is the distance from its surface to the specimen surface, should be 0.17mm.

Slide glass
This glass plate should ideally have a length of 76mm, a width of 26mm ± 1mm and a thickness between 0.9 and 1.4mm.

Vernier scales
These scales allow easy identification of the specimen position (coordinates), so that you can easily return to a particular region of interest after scanning the slide (Fig. 24).

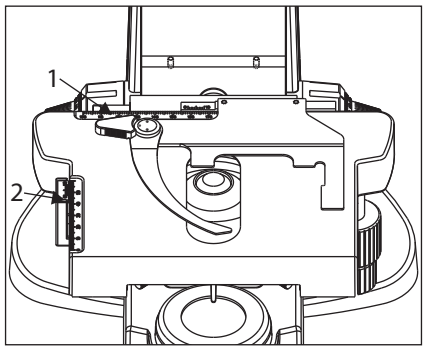


Fig. 24

1. The horizontal coordinate can be read at position (1) on the specimen holder.
2. The vertical coordinate can be read at the index line (2).

3 ADJUSTING THE FOCUS

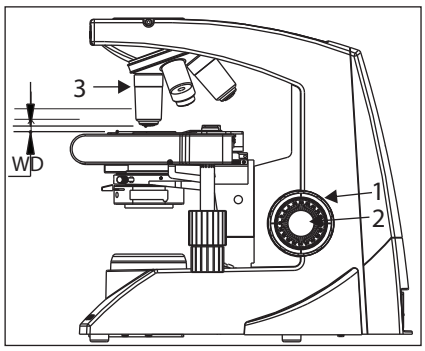


Fig. 25

Focusing procedure (Fig. 25)

1. Turn the coarse focus knob (1) clockwise so that the objective (3) is as close as possible to the specimen (we recommend starting with the 10x objective).
2. While observing the specimen through the eyepieces, slowly turn the coarse focus knob (1) counterclockwise to lower the stage.
3. When the specimen is coarsely focused (an image is visible), turn the fine focus knob (2) to focus the fine detail.

Working distance (WD)

The WD is the distance between the objective and the specimen when the specimen is in sharp focus.

Objective magnification	4X	10X	40X	100X
WD (mm)	30.0	4.34	0.55	0.15

4 ADJUSTING THE INTERPUPILLARY DISTANCE (IPD)

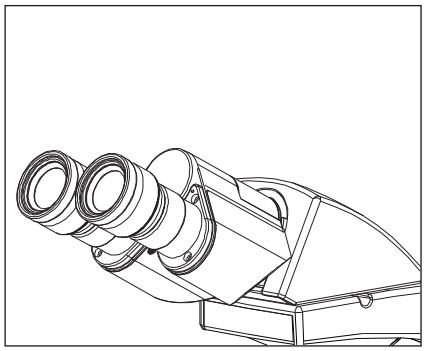


Fig. 26

Interpupillary distance adjustment aligns the two eyepieces with the pupils of both eyes, so that you observe a single microscope image through the two eyepieces in stereo vision. This greatly helps to reduce fatigue and discomfort during observation.
While looking through the eyepieces, move both eye tubes sideways until the left and right fields of view coincide completely. The IPD scale is printed on the circular disc between the two eye tubes. The position of the index dot (▪) indicates the interpupillary distance.
Note your interpupillary distance so that you can quickly set it again in the future. This is useful when several users work with the microscope.

5 ADJUSTING THE DIOPTER

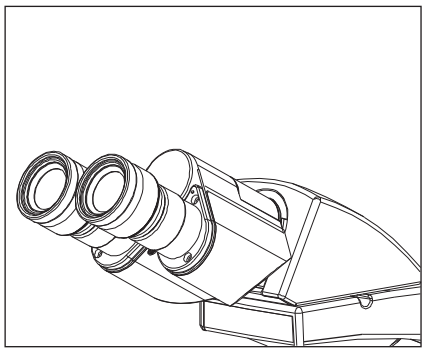


Fig. 27

Procedure for adjusting the diopter:
1. Turn the right eyepiece to the center of the diopter scale markings.
2. While looking through the right eyepiece with your right eye, turn the coarse and fine focus knobs to bring the specimen into focus.
3. While looking through the left eyepiece with your left eye, turn only the diopter adjustment ring on the eyepiece until the specimen is in the best possible focus.

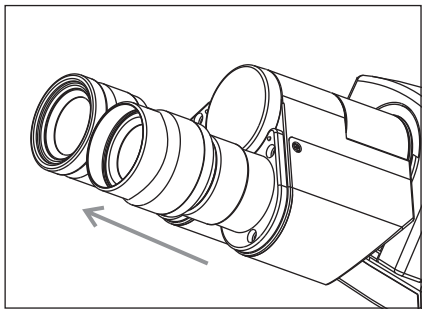


Fig. 28

Using the eye guards

When wearing eyeglasses
Use the eye guards in the normal, folded-down position. This prevents the eyeglasses from being scratched.

When not wearing eyeglasses
Extend the folded eye guards outward (direction of the arrow) to keep ambient light out of your line of vision.

6 CENTERING THE CONDENSER

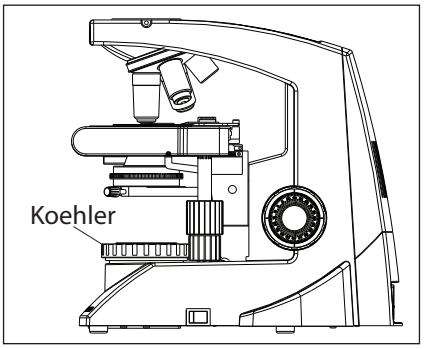
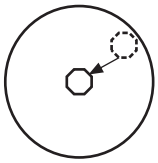


Fig. 29



The condenser is fixed and cannot decenter. If there is any error, remove the condenser by loosening the thumb screw and reinstall it.

For models with Koehler illumination:
The Koehler mount has a floating diaphragm mount (Fig. 30, 3), with which the Koehler illumination can be centered with respect to the condenser.

1. Place a specimen slide on the stage.
2. Click the 10x objective into position.
3. Focus on the specimen.
4. Close the base diaphragm and remove the slide.
5. Move the condenser up and down to obtain a sharp image of the base diaphragm.
6. Center the base diaphragm by floating it into position (Fig. 29).
7. Leave the base diaphragm in its final position. Close the base diaphragm fully.

7 ADJUSTING THE CONDENSER POSITION AND APERTURE IRIS DIAPHRAGM

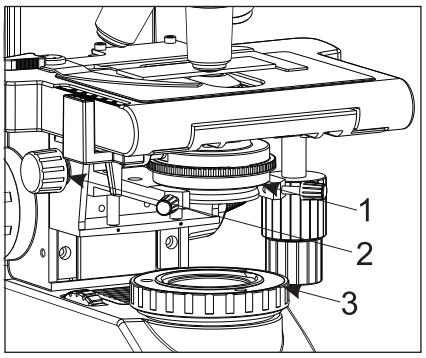


Fig. 30

The condenser is most often used in its highest position. If the observed field of view is not bright enough, brightness may be improved by lowering the condenser slightly.

1. Turn the condenser height adjustment knob (2) to move the condenser to the highest or desired position (Fig. 30).
2. The aperture iris diaphragm ring (1) has an objective magnification scale (4x, 10x, 40x, 100x). Slide the diaphragm lever left or right to obtain the desired illumination level (Fig. 30).

8 SWITCHING THE OBJECTIVES

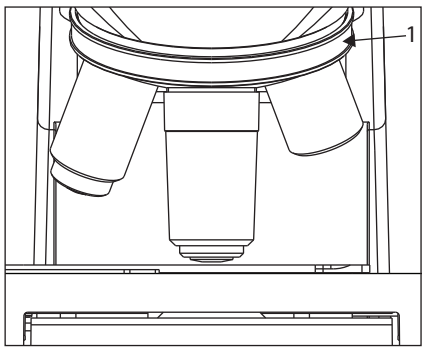


Fig. 31

Rotate the revolving nosepiece (1) so that the objective to be used is in line above the specimen. Always use the ribbed grip (1) to rotate the nosepiece.

9 USING THE 100X IMMERSION OBJECTIVE

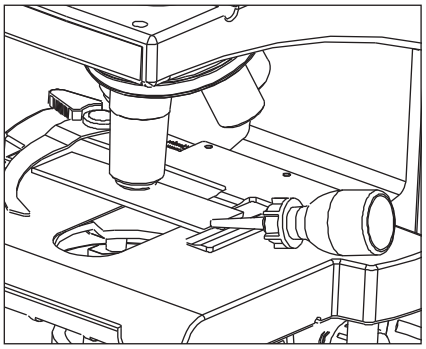


Fig. 32

The designated immersion oil must be in contact with the front lens of the 100x immersion objective; otherwise the specimen will appear distorted and dull. We recommend always using LABOMED immersion oil.

Immersion procedure:

1. Bring the specimen into focus, first with the 10x and then with the 40x objective.

2. Move the 40x objective out of the light path, turning toward the 100x, and place a drop of immersion oil on the center of the specimen.

3. Rotate the revolving nosepiece to engage the immersion objective and turn the fine focus knob to bring the specimen into focus.

Caution:
Air bubbles in the oil affect the image quality, so make sure that the oil is free of bubbles. To remove bubbles, rotate the revolving nosepiece slightly to agitate the oil.

4. After use, remove the oil from the front lens of the objective by wiping with lens tissue slightly moistened with a mixture of ether (70%) and alcohol (30%).

Caution:
If immersion oil gets into your eyes, rinse them thoroughly with fresh water. If immersion oil gets on your skin, wash the affected areas with soap and water. If discomfort persists, consult your physician immediately.

12 AMBIENT REQUIREMENTS

For Operation	Temperature Rel. humidity (without condensation) Air pressure	+5°C.....+40°C 30%.....80% 700hPa.....1,060hPa
For Transportation and Storage	Temperature Rel. humidity (without condensation) Air pressure	-40°C.....+70°C 10%.....100% 500hPa.....1,060hPa

The unit meets the essential requirements of directive 73/23/EEC (Low Voltage Directive). The unit is marked CE and complies with IEC 61010-1.

13 DISPOSAL

Disposal must comply with locally applicable laws and regulations.

14 TROUBLESHOOTING GUIDE

Under certain conditions, the performance of the unit may be adversely affected by factors other than defects. If problems occur, review the following list and take corrective action as needed. If the problem persists, contact LABOMED or your local LABOMED dealer.

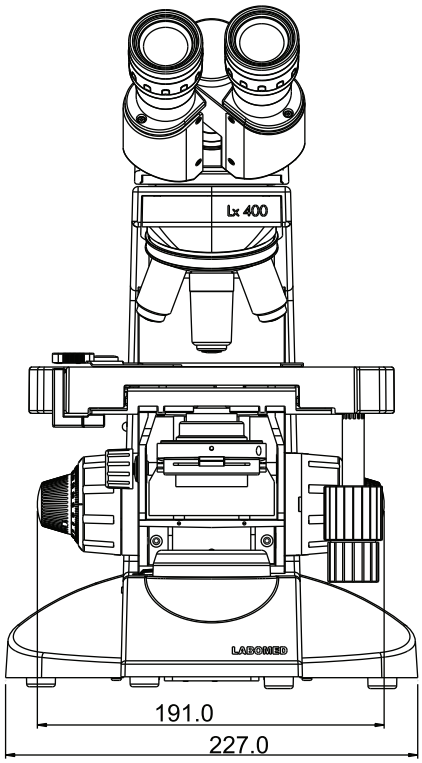
OBSERVATION	CAUSE	REMEDY
1. Uneven brightness in the field of view	The objective is not engaged in the light path	Engage the objective in position until the nosepiece clicks
	The condenser is too low	Raise it to obtain more light (p. 19)
	The objective, eyepieces, condenser and/or window lens are dirty	Clean them thoroughly as described in “Optical cleaning” (p. 4)
2. Dust or stains are visible in the field of view	The eyepieces, condenser, window lens and/or specimen glass are dirty	Clean the glass parts thoroughly with lens tissue and cleaning solution as described in “Optical cleaning” (p. 4)
3. Glare is visible in the field of view	The condenser is too low The condenser iris diaphragm ring is closed	Raise the condenser Adjust the aperture according to the objective magnification (p. 19)
4. The image is hazy or unclear	The objective is not engaged in the light path	Engage the objective in position until it clicks (p. 19)
	The objective, eyepieces, condenser and/or specimen glass are dirty	Clean the glass parts thoroughly with lens tissue and a cleaning cloth
	Immersion oil is not used with an immersion objective	Use immersion oil as described (p. 20)
	Bubbles in the immersion oil	Remove the bubbles by agitation (p. 20)
	The specified immersion oil is not used	Use the immersion oil supplied by LABOMED
5. Part of the image is out of focus	The objective is not engaged in the light path	Engage the objective in position until the nosepiece clicks
	The specimen is not set properly on the stage	Set the specimen correctly on the stage and secure it with the specimen holder (p. 16)
6. The coarse focus knob cannot lower the stage far enough	The condenser is too low	Raise the condenser
7. The fields of view of the two eyepieces do not match	The interpupillary distance is not adjusted properly Diopter compensation for the two eyes is not set The left and right eyepieces have different magnifications	Adjust the IPD to the appropriate setting (p. 18) Adjust the diopter settings (p. 18) Make sure that both eyepieces have the same magnification. LABOMED does not recommend using third-party eyepieces together with LABOMED eyepieces

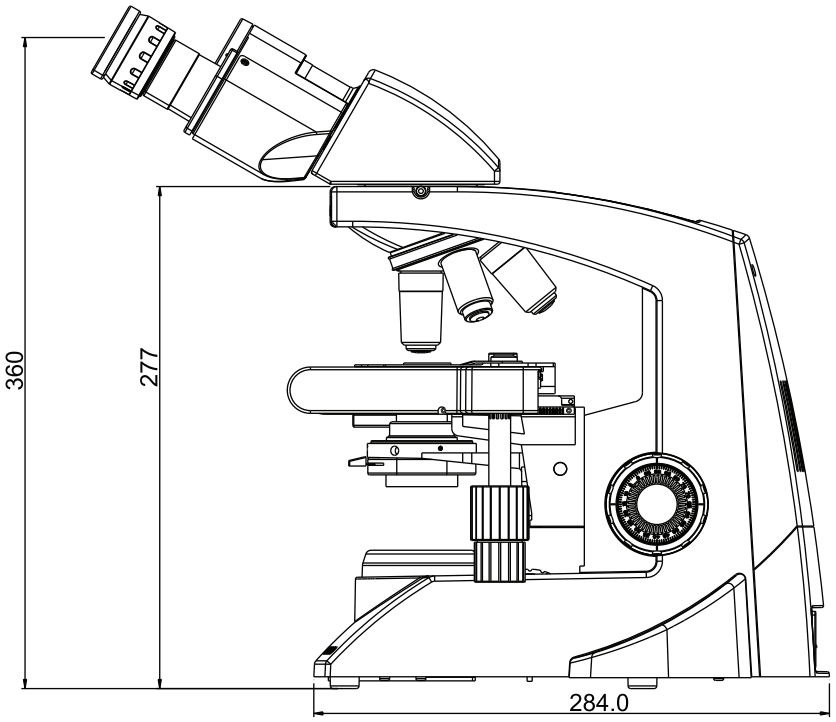
OBSERVATION	CAUSE	REMEDY
8. The objective hits the specimen when switching to a higher-magnification objective	The specimen slide is upside down	Set the specimen correctly with the cover glass facing upwards
	The cover glass is too thick	Use a cover glass 0.17mm thick
	The stage is raised too high	Lower the stage
	The slide has slipped from the slide holder	Reposition the slide in the slide holder
	The slide is too thick	Use slides 0.9 to 1.4mm thick
9. The LED does not turn on	The LED is not mounted	Fit an LED
	The LED has failed	Replace the LED
	The power cord is unplugged or not firmly connected	Plug the power cord securely into the microscope and the wall outlet
	The fuse has blown	Replace with a working fuse
	The battery is low	Charge the battery
10. The LED fails frequently	The specified LED is not used	Replace with the specified LED

15 SPECIFICATIONS

1. Illumination	Built-in illumination system, LED		
2. Focusing mechanism	Stage height adjustment mechanism Fine adjustment scale: 3.0µm per graduation Fine adjustment stroke: 0.3mm per turn Total stroke: 12.7mm Coaxial coarse and fine focusing on ball drive		
3. Revolving nosepiece	Quadruple, fixed positions (reverse angle)		
4. Observation tube		Binocular	Trinocular
	Field number	20 (standard)	20 (standard)
	Tube tilting angle	30°	30°
	Interpupillary distance adjustment range	48-75	48-75
5. Stage	Size	200 x 140mm (with mechanical stage)	
	Movement range	78 x 54mm	
	Specimen holder	Double specimen holder	
6. Condenser	Type	Abbe condenser (daylight filter detachable)	
	N.A.	1.25	
	Aperture iris diaphragm	Built-in	
7. Dimensions and weight	284.0mm (L) x 227.0mm (W) x 360.6mm (H); 7 kg net		
8. Electrical	LED battery	7.4V, 1000mAh	
	Charging time	Up to 5 hours (with fully discharged battery)	
	Total battery time	Up to 2 hours when fully charged	
	LED life	50,000 hours	
9. Operating environment	Indoor use Altitude: max. 2000 meters Ambient temperature: 5° to 40°C (41° to 104°F) Maximum relative humidity: 80% for temperatures up to 31°C (88°F), decreasing linearly through 70% at 34°C (93°F) to 50% relative humidity at 40°C (104°F) Supply voltage fluctuations: not to exceed ±10% of the nominal voltage Pollution degree: 2 (in accordance with IEC 60664) Installation/overvoltage category: II (in accordance with IEC 60664)		
10. Weight		Binocular	Trinocular
	Packed	14 kg	14 kg
	Unpacked	7 kg	7 kg

16 DIMENSIONS





Revision History

Rev. No.	Date of Release	DCR #	Change	App. By
1.5	March 27, 2019	DCR/08/19	System Diagram	S.Bal
1.6	April 14, 2022	DCR/06/22	Reviewed and updated for typo errors	S.Bal

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