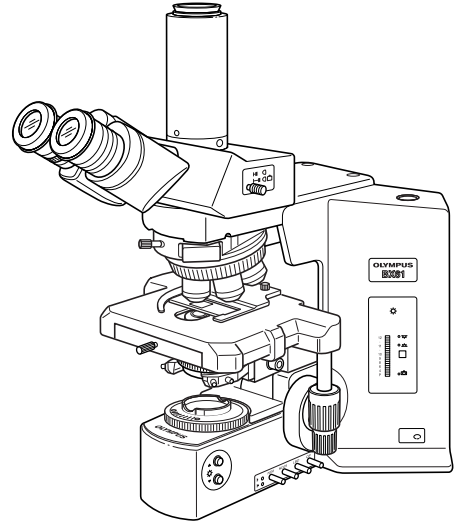


# OLYMPUS®

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## INSTRUCTIONS

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# BX61

## MOTORIZED SYSTEM MICROSCOPES

This instruction manual is for the Olympus Motorized System Microscopes Models BX61 and BX62. To ensure the safety, obtain optimum performance and to familiarize yourself fully with the use of this microscope, we recommend that you study this manual thoroughly before operating the microscope. Retain this instruction manual in an easily accessible place near the work desk for future reference.



AX7611



# CONTENTS

Correct assembly and adjustments are indispensable to allow the microscope manifest its full performance. If you are going to assemble the microscope by yourself, please read chapter 7, "ASSEMBLY" (pages. 29 to 32).

**IMPORTANT – Be sure to read this section for safe use of the equipment. – 1-3**

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This device complies with the requirements of directive 98/79/EC concerning in vitro diagnostic medical devices. CE marking means the conformity to the directive.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**FCC WARNING:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

# IMPORTANT

Each of these microscopes employs a UIS2/UIS (Universal Infinity System) optical design, and should be used only with modules designed for the BX2 series (which belong to the Olympus BX series microscopes) and objectives/eyepieces for the UIS series.

For the applicable module, please consult Olympus or the catalogues. Less than optimum performance may result if inappropriate accessories are used.

### Configuration of Instruction Manuals

Since these microscopes are expandable to a variety of systems, separate instruction manuals are provided so that the user has to read only the manuals according to the user's own system.

Manual Name	Main Contents
BX61	Transmitted light brightfield observation procedure
BX-UCB/U-HSTR2	Functions of the Control Box (incorporating the power supply) and Hand Switch
BX2 Software for PC (CD-ROM)	Methods of PC Control of Functions
BX-RFAA	Reflected light fluorescence observation procedure
BX-RLAA	Reflected light brightfield/darkfield observation
U-UCD8A	Motorized universal condenser
U-FWT/FWR/FWO	Motorized filter wheels



## SAFETY PRECAUTIONS

- After the equipment has been used in an observation of a specimen that is accompanied with a potential of infection, clean the parts coming in contact with the specimen to prevent infection.
  - Moving this product is accompanied with the risk of dropping the specimen. Be sure to remove the specimen before moving this product.
  - In case the specimen is damaged by erroneous operation, promptly take the infection prevention measures.
  - The product becomes unstable if its height is increased by an accessory mounted on it. In this case, take anti-toppling measures to prevent the specimen from being dropped when the product topples down.
- Install the microscope on a sturdy, level table or bench so as not to block the air vents on the underside of the base.  
Do not place the microscope on a flexible surface, as this could result in blocking the air vents and cause overheating or a fire.
- If a foreign object is caught during motorized focusing operation, there will be an error in the focusing block and the motorized focusing operation will be suspended.

### Recovery procedure

- If there is no error in motorized operation, the caught object can be removed by turning the focusing knob.
  - If there is an error in motorized operation, the focusing knob becomes inoperable. Disassemble the relevant modules to remove the caught object. Replace the relevant modules afterward.
  - Turn off the power and then on again. The system will restart unless there is a malfunction in the motor.
- To activate temporary stop during focusing operation, turn the focusing knob (or dial) on the microscope frame (in either direction) or press any of the FOCUS control buttons (▽, △, F/C and ESC) (except during PC communication).

When the main switch of the BX-UCB control box is set to "I" (ON), the focusing operation starts automatically as part of initialization (this operation consists of temporary lowering and then returning to the original position of the stage). If any of the operations mentioned above is performed, an emergency stop will also occur. In this case, set the main switch to "O" (OFF) and then "I" (ON) again.

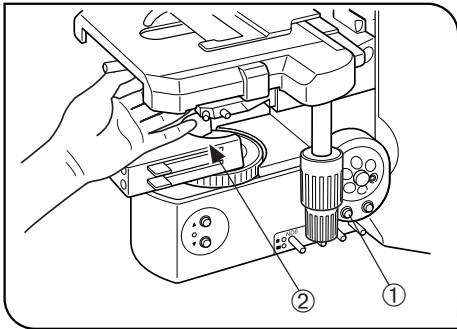


Fig. 1

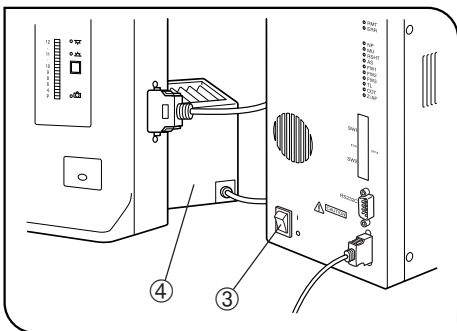


Fig. 2

5. When lowering the stage by pressing the stage DOWN button ①, be careful not to have your hand caught between the bottom ② of the condenser and the base.
6. The surfaces of the lamp housing on the rear of the microscope will become extremely hot during operation. When installing the microscope, make sure to allow ample free space (10 cm or more) around and in particular above the lamp housing.
7. When installing the microscope, route the power cord away from the lamp housing. Should the power cord come in contact with the hot lamp housing, the power cord could melt and cause electric shock.
8. To avoid potential shock hazards and burns when replacing the light bulb, set the main switch ③ to "⓪OFF" then disconnect the power cord from the wall outlet in advance. Whenever you replace the bulb during use or right after use, allow the lamp housing ④ and bulb to cool before touching. (Fig. 2)

Designated	12V100WHAL (PHILIPS 7724)
halogen bulbs:	12V50WHAL-L (LIFE JC)

★ The microscope also incorporate a fuse (this should be replaced by the manufacturer or an authorized agent).

9. Always use the power cord provided by Olympus. If no power cord is provided, please select the proper power cord by referring to the section "PROPER SELECTION OF THE POWER SUPPLY CORD" at the end of this instruction manual. If the proper power cord is not used, product safety performance cannot be warranted.
10. Always ensure that the **grounding terminal** of the microscope and that of the wall outlet are properly connected. If the equipment is not grounded, Olympus can no longer warrant the electrical safety performance of the equipment.
11. Never insert metallic objects into the air vents of the microscope frame as this could result in electrical shock, personal injury and equipment damage.
12. When using the U-FWR motorized filter wheel for reflected light observation, remove the push ring driver from the position where it is attached by magnetism in advance to prevent it from dropping. If the driver drops in a certain place, an electric shock and/or burns may result.

### Safety Symbols

The following symbols are found on the microscope. Study the meaning of the symbols and always use the equipment in the safest possible manner.

Symbol	Explanation
	Indicates that the surface becomes hot, and should not be touched with bare hands.
	Before use, carefully read the instruction manual. Improper use could result in personal injury to the user and/or damage to the equipment.
	Indicates that the main switch is ON.
	Indicates that the main switch is OFF.

### Warnings

Warning engraving/stickers are placed at parts where special precaution is required when handling and using the microscope. Always heed the warnings.

Warning engraving position	Lamp housing (Warning against high temperature)
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## 1 Getting Ready

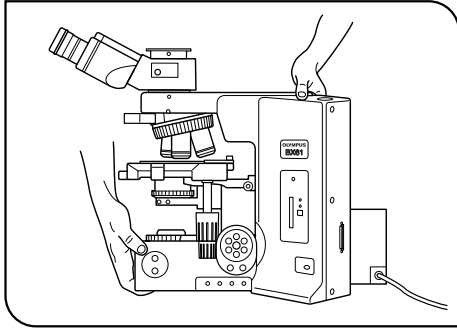


Fig. 3

1. A microscope is a precision instrument. Handle it with care and avoid subjecting it to sudden or severe impact.
2. Do not use the microscope where it is subjected to direct sunlight, high temperature and humidity, dust or vibrations. (For the operating conditions, refer to chapter 5, "SPECIFICATIONS")
3. When moving the microscope, remove the modules that may drop including the specimen from the microscope in advance, hold it by the hand hook on the rear and the base as shown on the left (Fig. 3) and carry carefully (Weight: approx. 16 kg).

★ **Before transporting the microscope, be sure to remove the specimen, eyepieces and color glass filter so that they will not drop. Also remove other modules attached to the microscope because they increase the system weight.**

★ **Damage to the microscope will occur if you grasp it by the stage, focus adjustment knob or binocular section of the observation tube.**

4. The BX61 series can be used with up to two intermediate attachments including a U-CA magnification changer, U-EPA2 eyepoint adjuster, etc. For restrictions when using two intermediate attachments, make sure to read the instruction manuals provided with the respective intermediate attachments.

## 2 Maintenance and Storage

1. To clean the lenses and other glass components, simply blow dirty away using a commercially available blower and wipe gently using a piece of cleaning paper (or clean gauze).  
If a lens is stained with fingerprints or oil smudges, wipe it gauze slightly moistened with commercially available absolute alcohol.

▲ **Since the absolute alcohol is highly flammable, it must be handled carefully.**

**Be sure to keep it away from open flames or potential sources of electrical sparks — for example, electrical equipment that is being switched on or off, which could cause ignition of a fire.**

**Also remember to always use it only in a well-ventilated room.**

2. 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.
3. Do not disassemble any part of the microscope as this could result in malfunction or reduced performance.
4. When not using the microscope, set the main switch to "○" (OFF), wait until the lamp housing has cooled down, and cover the microscope with a dust cover before storage.
5. When disposing of the microscope, check the regulations and rules of your local government and be sure to observe them.

## 3 Caution

If the microscope is used in a manner not specified by this manual, the safety of the user may be imperiled. In addition, the equipment may also be damaged. Always use the equipment as outlined in this instruction manual.

The warning, caution and other notes in this manual use the following symbols.

▲: Indicates that failure to follow the instructions in the warning could result in bodily harm to the user and/or damage to equipment (including objects in the vicinity of the equipment).

★: Indicates that failure to follow the instructions could result in damage to equipment.

◎: Indicates commentary (for ease of operation and maintenance).

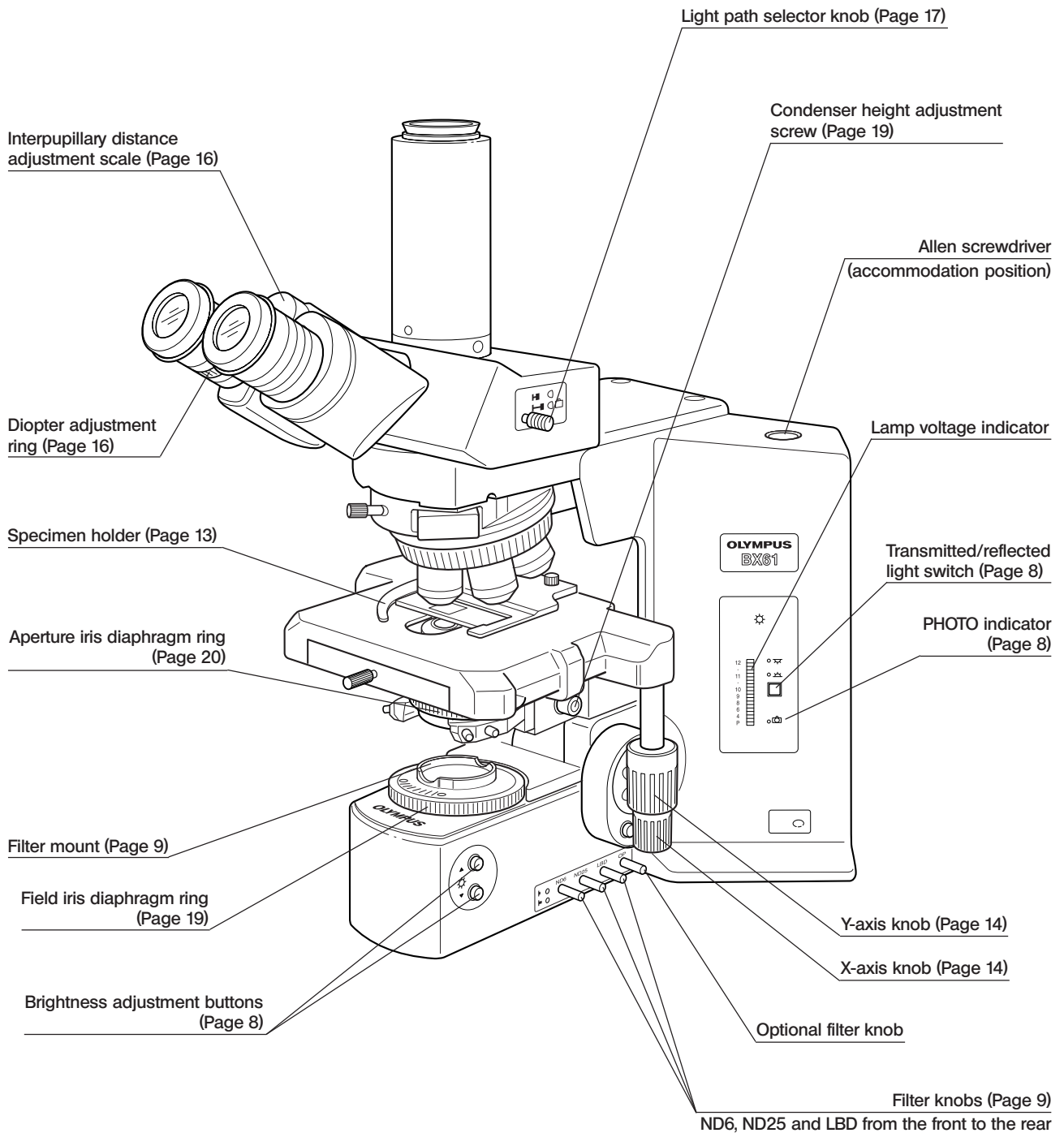
## 4 Intended use

This instrument has been designed to be used to observe magnified images of specimens in routine and research applications. Do not use this instrument for any purpose other than its intended use.

# 1 NOMENCLATURE

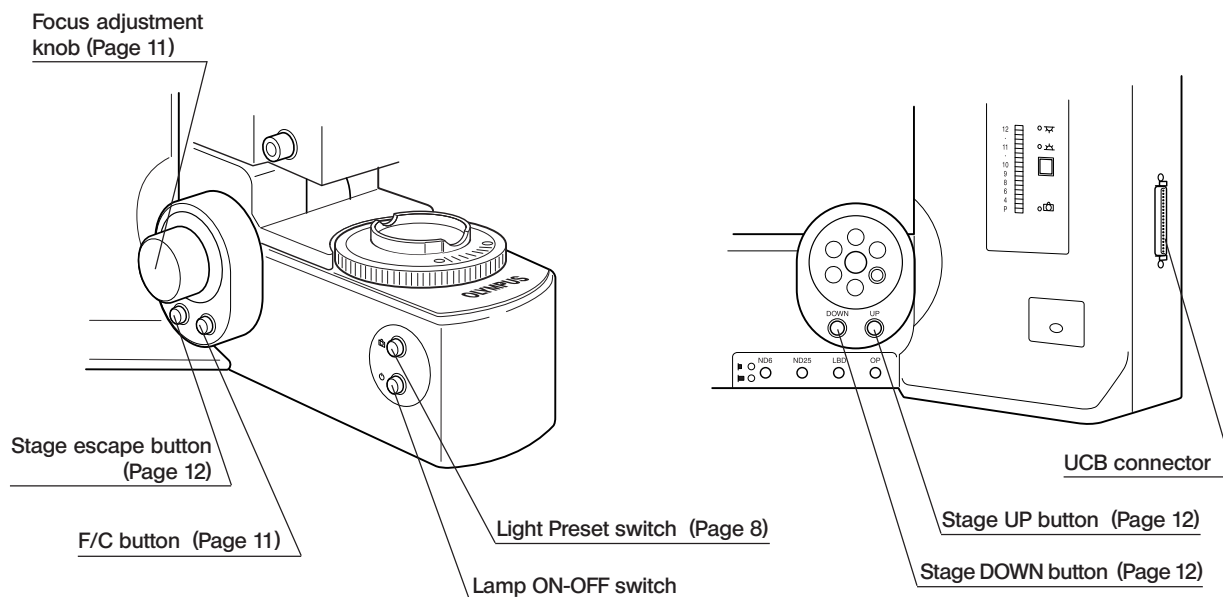
© If you have not yet assembled the microscope, read chapter 7, "ASSEMBLY" (pages 29 to 32).

## Transmitted light specification models

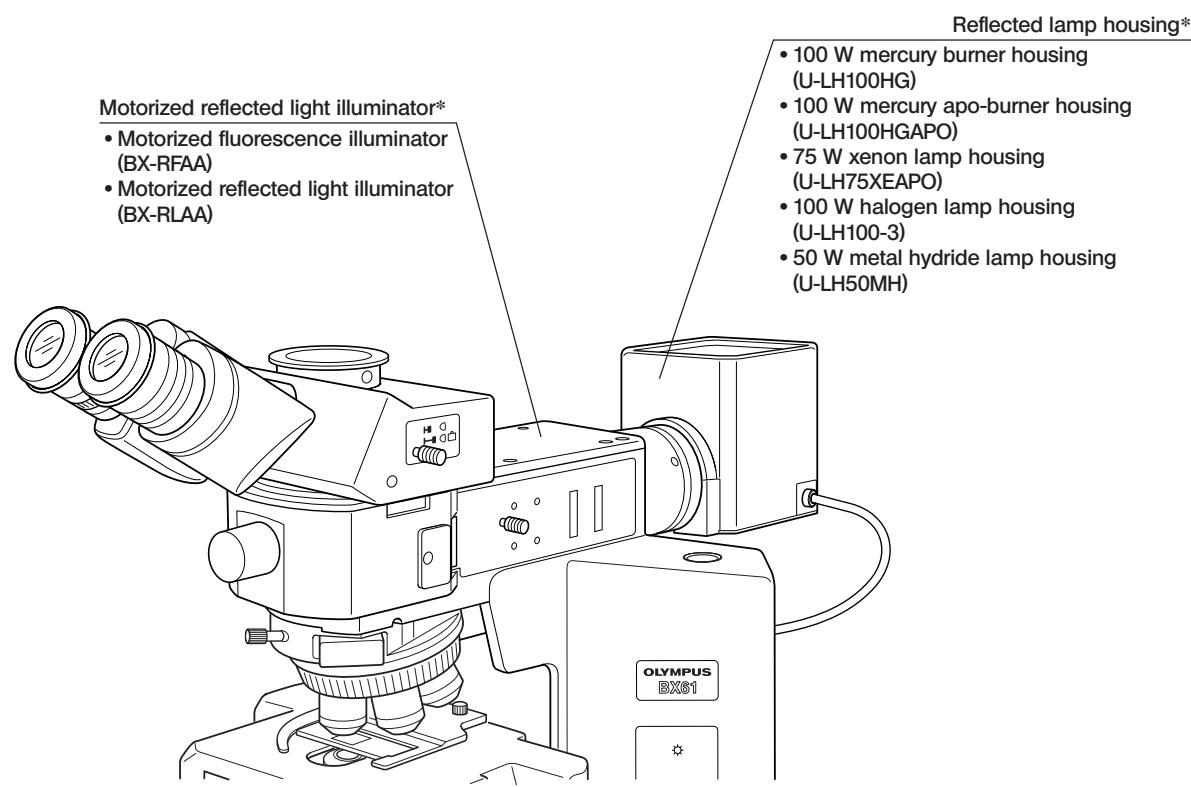




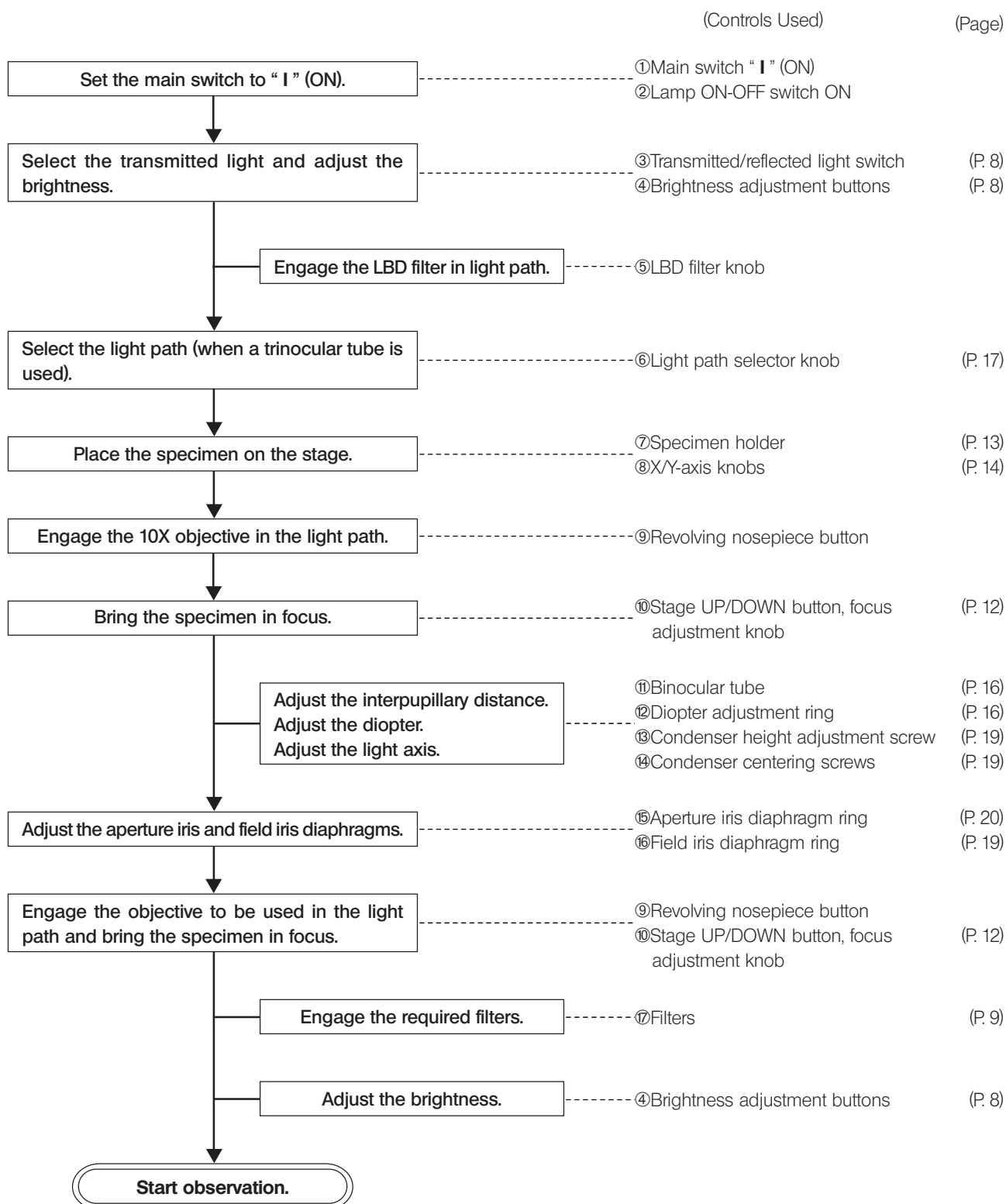
**Base**

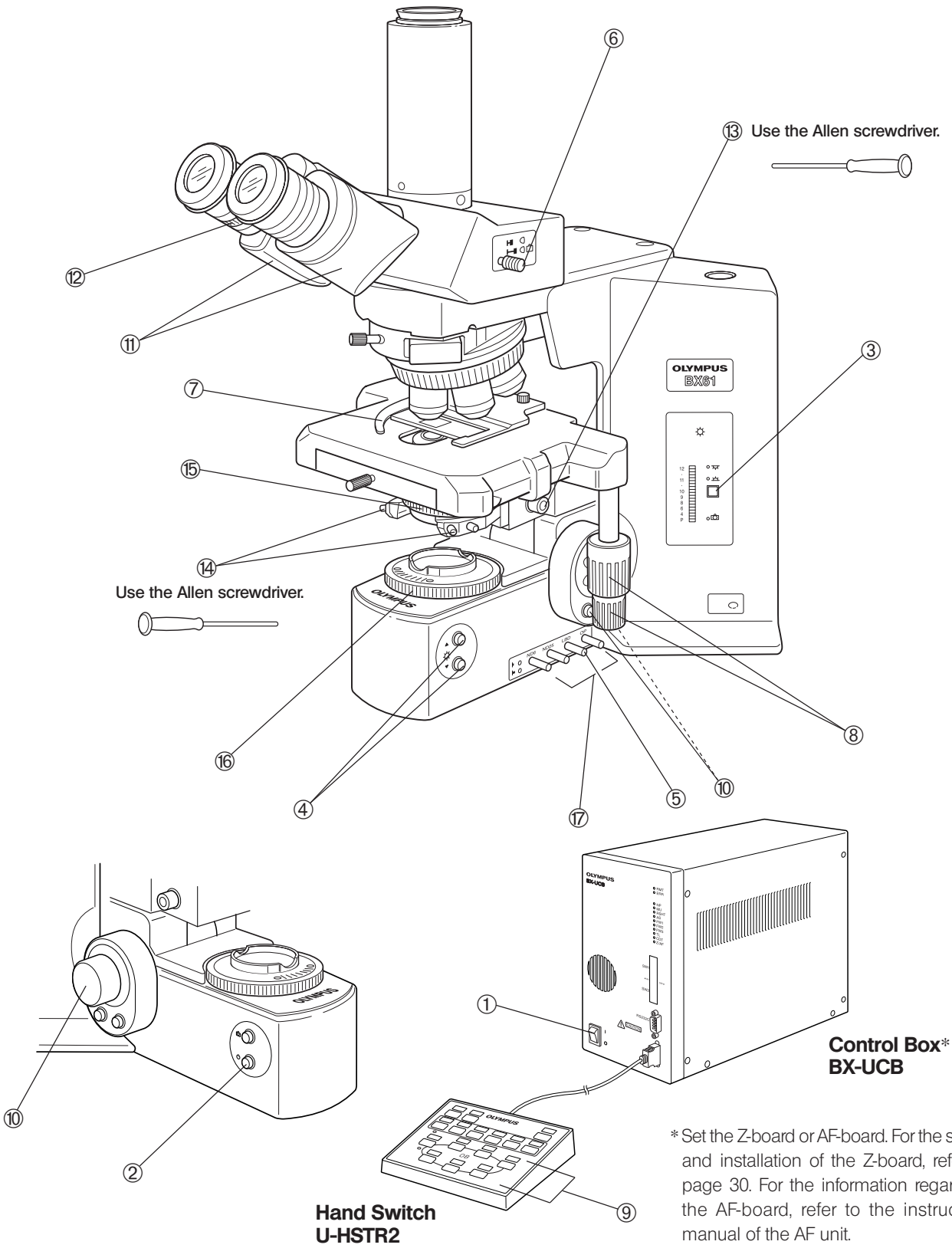


**Reflected light specification models** \* For the reflected illuminators and reflected lamp housings, please also refer to their instruction manuals.



# 2 TRANSMITTED LIGHT BRIGHTFIELD OBSERVATION PROCEDURE





© Make a photocopy of the observation procedure pages and post it near your microscope.

# 3 USING THE CONTROLS

## 3-1 Base

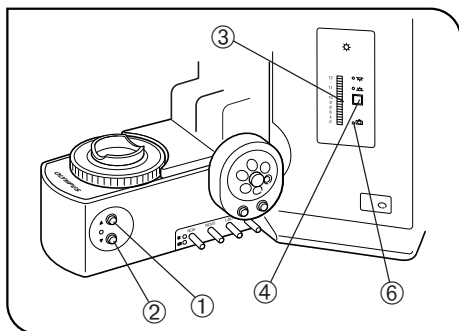


Fig. 4

### 1 Voltage Indication (Fig. 4)

1. Press the Brightness adjustment button ① to increase the voltage and make illumination brighter.  
Pressing the button ② makes the illumination darker.
2. The numerals on the left of the lamp voltage LEDs ③ indicate the approximate voltage.

★ The LED may sometimes go out (temporarily) when the motor is driving. Even in this case, there is no fluctuation in illumination voltage.

### 2 Transmitted/Reflected Light Switch (Fig. 4)

The illumination can be switched between the transmitted light and reflected light by pressing the transmitted/reflected light switch ④.

▽ : Reflected light illumination

△ : Transmitted light illumination

The indicator of the selected illumination lights.

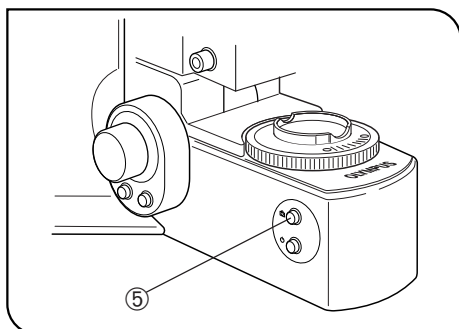


Fig. 5

### 3 Light Preset Switch (Fig. 5)

◎ The Light Preset switch sets the light intensity voltage to a voltage suitable for color photography\* (the factory default is 9 V) regardless of the current setting of the light intensity adjustment buttons.

\* Achieved by engaging the built-in LBD filter.

#### Setting the Desired Brightness (Figs. 4 & 5)

1. Press the Light Preset switch ⑤. The PHOTO indicator ⑥ lights up.
2. Press one of the light intensity adjustment buttons ① ② to set the desired brightness.
3. Press the Light Preset switch again. The indicator turns off, the brightness returns to the original brightness but the setting made above is stored in memory.
4. Hereafter, pressing the Light Preset switch sets the brightness to the intensity value set in step 2 above.

★ Be sure to set the light intensity voltage back to 9 V when color photography is to be performed.

◎ When the Light Preset switch ⑤ is pressed, a note sound (short beep) is generated at the 9 V position.

### 4 Using the Filters (Figs. 6 - 11)

◎ You can place a filter in the light path with one of the following four methods.

- Push in the knob of a built-in filter to engage it in the light path. (Page 9)
- Place a filter on the filter mount on the base and engage in the light path. (Page 9)
- Insert a filter in the U-FC filter cassette, attach it on the filter mount and engage it in the light path by sliding the filter lever. (Page 9)
- Insert a filter in the U-FWT filter wheel, attach it on the filter mount and engage it in the light path by motorized operation (using the PC). (Refer to the separate instruction manual)

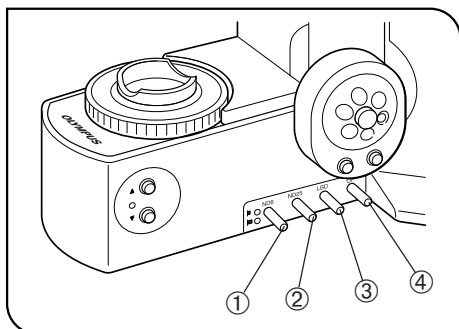


Fig. 6

**Using Built-In Filters (Fig. 6)**

Each filter can be engaged into the light path by pressing one of the filter knobs ① to ④ in. Pressing the button again disengages the filter from the light path.

	Filter Type/Purpose
①	ND6 (Neutral Density filter for light adjustment, transmittance 6%)
②	ND25 (Neutral Density filter for light adjustment, transmittance 25%)
③	LBD (for color balancing, daylight filter)
④	OP (optional) filter set*

\* Ask your Olympus representative to mount the filters.

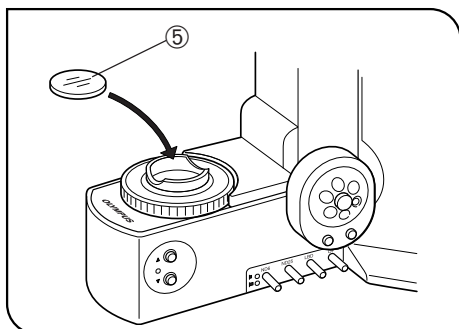


Fig. 7

**Mounting a Single Filter (Fig. 7)**

A filter with a diameter of 45 mm ⑤ can be placed on the filter mount on the base. If you need to place multiple filters, please purchase the U-FC filter cassette.

★ Even when a filter cassette is used, a filter with thickness of no more than 3 mm can still be placed on the filter mount.

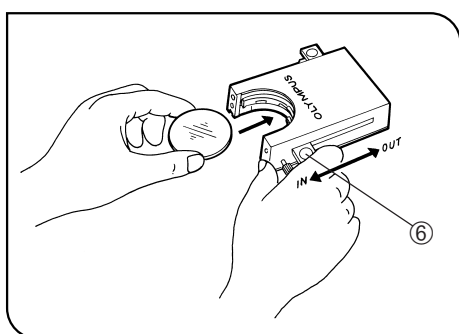


Fig. 8

**Using the Filter Cassette (Figs. 8 - 11)**

**Loading Filters into Filter Cassette**

◎ The filter cassette accommodates filters with a diameter of 45 mm and thickness of 2.7 mm or less.

◎ The filter cassette has two filter levers on the right side and one on the left side.

1. Move all filter levers to the OUT position except for the one belonging to the slot into which the filter is to be inserted.
2. Slide the lever ⑥ to the IN position. Make sure that it clicks securely into place. (Fig. 8)
3. Holding the lever in the position shown in Fig. 8, put the filter into the cassette by inserting it in the direction indicated by the arrow.
4. Insert the other two filters in the same manner.

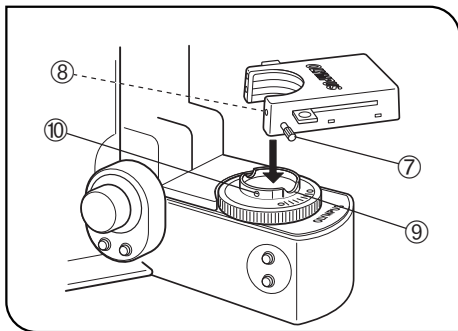


Fig. 9

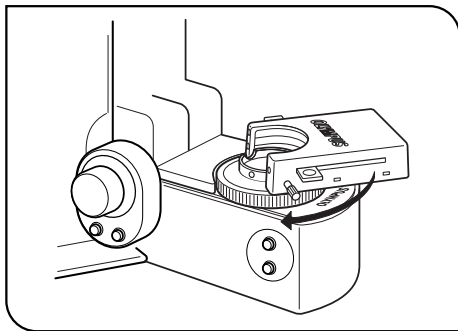


Fig. 10

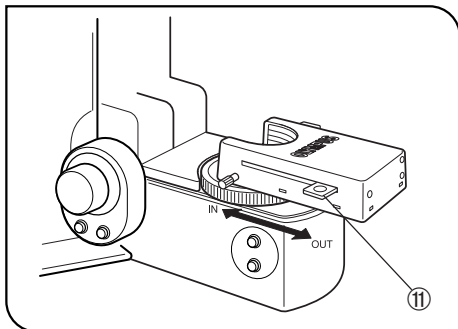


Fig. 11

### Mounting the Filter Cassette

1. Fully loosen the filter cassette clamping screw ⑦. (Fig. 9)
2. Align the key ⑧ on the bottom surface of the filter cassette with the positioning slot ⑨ on the filter mount, then snap the filter cassette into place from above.
3. Rotate the filter cassette to align its sides with the base. (Fig. 10)
4. Align the clamping screw ⑦ with the positioning hole ⑩ on the filter mount, then tighten the screw to fasten the filter cassette.

★ When the filter cassette is installed, the condenser may hit the filter cassette when the stage is lowered. Therefore, exercise caution when lowering the stage with the filter cassette installed.

### Using the Filter Cassette (Fig. 11)

Usable Filters	Applications	
45ND-6, 45ND-25	Neutral density filter	
45G-530, 45G-533, 45IF550	Green	B&W contrast filter
45Y-48	Yellow	
45O-560	Orange	

Up to three of the above filters can be loaded in the filter cassette. Moving the levers ⑪ on the left and right sides of the cassette to the IN position brings the corresponding filter into the light path.

### 3-2 Focusing Block

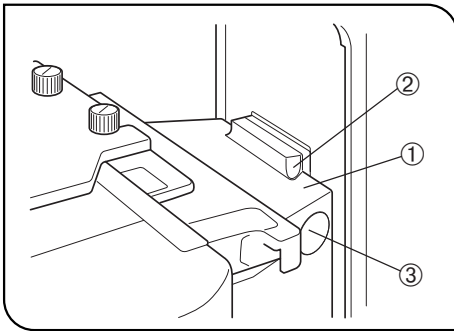


Fig. 12

★If the substage is not installed in the correct position, it may deviate from the coverage range of the damper spring of the objective and damage the specimen.

Ensure that the top surface ① of the substage is flush with the bottom surface of the notch ② on the mount dovetail. If they are not flush, loosen the clamping screw ③ and lower the substage until it is stopped.

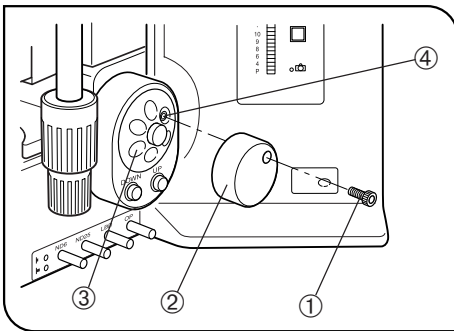


Fig. 13

#### 1 Replacing the Focus Adjustment Knob (Fig. 13)

★ The focus adjustment knob is installed on the right side of the microscope when it left the factory.

⊙ The focus adjustment knob is designed detachable to prevent interference with hand during manipulation of the focus adjustment knob or X/Y-axis knobs.

Usually attach the knob on the opposite side to the stage feed knobs.

1. Loosen the clamping screw ① and remove the focus adjustment knob ②.

2. Remove the seal from the focus adjustment knob screw hole on the other side and attach the knob by reversing the removal procedure.

3. Attach a provided seal on the screw hole ④ of the focus adjustment dial ③, from which the focus adjustment knob has been removed.

⊙ The focus adjustment dial ③ can be operated with your fingertip or finger surface at the same time as manipulating the X/Y-axis knobs.

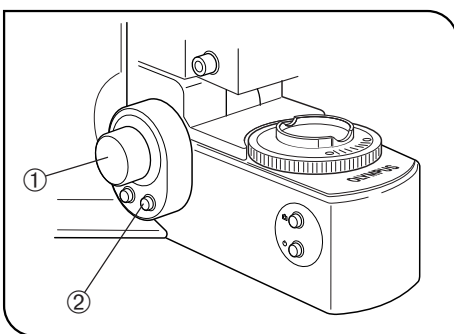


Fig. 14

#### 2 F/C button (Fig. 14)

⊙ This button switches the movement of the stage using the focusing knob ① or dial between F (Fine) and C (Coarse). (For the purpose of safety, this button is set automatically to F at the moment the main switch of the BX-UCB control box is set to "I" (ON).)

• Each press of the F/C button ② switches F and C alternately.

Stage Fine movement:	0.1 mm per turn
Stage Coarse movement:	1 mm per turn

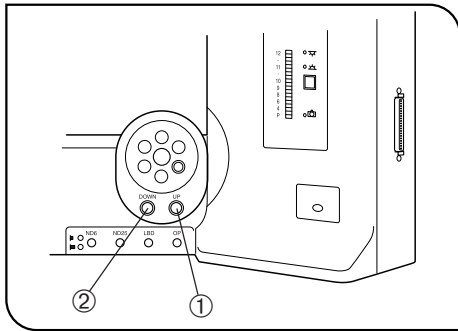


Fig. 15

### 3 Stage UP/DOWN Buttons

(Fig. 15)

▲When lowering the stage, be careful not to have your hand caught between the bottom of the condenser and the base.

- Press the stage UP button ① to raise the stage and press the stage DOWN button ② to lower the stage.
- The stroke is 25 mm. It becomes 14 mm when the U-FWT filter wheel is used.
- The upper limit of stage movement has been set so that the stage stops within the coverage range of the damper spring of objective when a slide specimen (thickness 1.2 mm) is used.

★When observing a metallurgic specimen with thickness above 1.2 mm, take care so that the stage does not hit the objective.

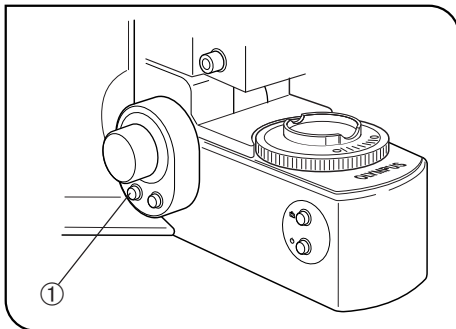


Fig. 16

### 4 Stage Escape Button

(Fig. 16)

When replacing the specimen, press the stage escape button ①. The stage will lower by 5 mm (in 1 sec.). Pressing the button again returns the stage to the original height.



### 3-3 Stage

◎The following description deals with biological specimens. When observing a metallurgic specimen, it is more convenient to replace the special stage or slide holder with the stage plate. (For details, refer to the instruction manual for the BX-RLAA)

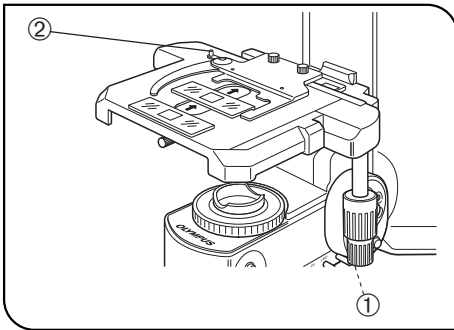


Fig. 17

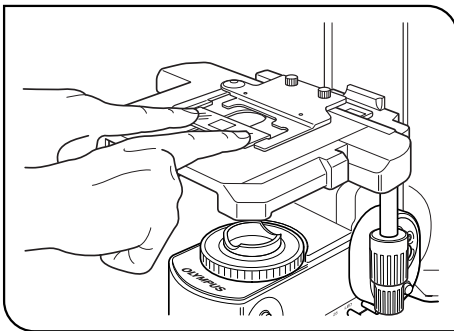


Fig. 18

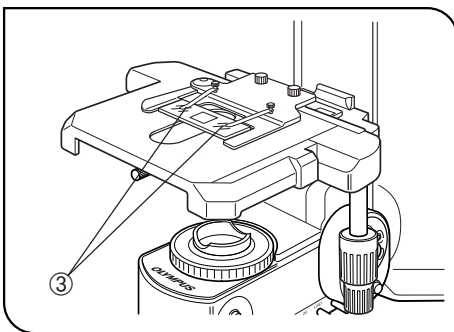


Fig. 19

#### 1 Placing the Specimen

- ★ The dimensions of the slide glass should be 26 x 76 mm with thickness of 0.9 to 1.2 mm, and the cover glass should have thickness of 0.17 mm.
- ★ When observing very large specimens, remove the slide holder and place the specimen directly on the stage.

##### Microscopy with Double-Slide Holder (Fig. 17)

1. Press the stage DOWN button ① or stage escape button to lower the stage.
2. Open the specimen holder clamping lever ② and place the specimen slides on the stage by sliding each slide from the front.
3. After placing the slides as far as they will go, gently release the clamping lever.

##### Microscopy with Single-Slide Holder (Fig. 18)

The specimen slide can easily be placed by sliding it into the slide holder from the front.

##### Examining a whole specimen

Use one of the thin slide holders listed below that cause less interference with the objectives\*.

- U-HRD-4
- U-HLD-4
- U-HLS-4

\* The applicable objectives are ones are ones with 40X or less magnification (except Apo series).

##### Using an Oil Immersion Objective

Adsorption of immersion oil can cause the specimen to drift. In such cases, it is recommended to use the optional BH2-SCB-3 specimen clip ③ for oil immersion objectives. (Fig. 19)

##### Using an Oil Immersion Condenser

It may be effective to use the optional U-SVRO (right-hand knob) or U-SVLO (left-hand knob) slotted stage which prevents close contact between the specimen and stage.

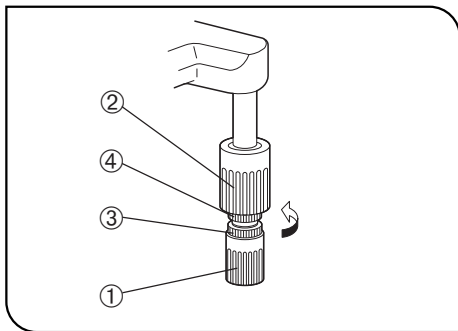


Fig. 20

## 2 Adjusting the X/Y-Axis Knob Tension (Fig. 20)

1. Hold the X-axis knob ① and slide up the Y-axis knob ② up to expose the adjustment knobs.
2. Turning the X-axis adjustment knob ③ or Y-axis adjustment knob ④ clockwise (in the direction of the arrow) increases the rotation tension and counterclockwise decreases it.

★ If the tension is adjusted too tight, a creaking sound may be heard during stage travel, and the stage stopping accuracy may be imperiled.

### CAUTION

After long hours of use, the stage guide may be deviated and the stage travel range may be decreased. However, this is not malfunction and can be corrected easily as described below.

[Treatment] X-axis direction: Hold the specimen holder and move the stage guide to the left and right so that it hits the stoppers.

Y-axis direction: Hold the upper stage and move it to the front and rear so that it hits the stoppers.

### Rubber Stage Knob Caps (Optional)

Ⓞ When the X/Y-axis knobs are fitted with the rubber caps, the knobs can be adjusted without slipping and fine adjustment is possible by holding the knobs with a very light force. The knob rubber caps also reduce fatigue after long hours of operation.

The U-SHGT thick type (thickness 5 mm) and U-SHG thin type (thickness 2 mm) knob rubber caps are available.

#### To attach the knob rubber caps:

First fit the larger rubber knob cap to the Y-axis (upper) knob from below it, then fit the smaller rubber knob cap to the X-axis (lower) knob from below it.

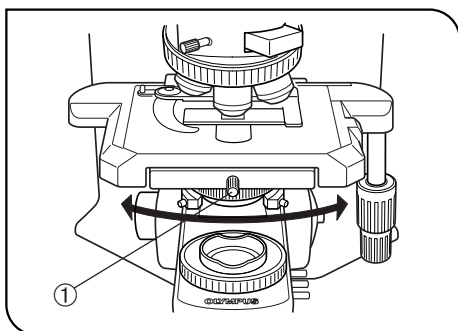


Fig. 21

## 3 Rotating the Stage (Fig. 21)

1. Slightly loosen the stage clamping knob ①.
2. The stage can be rotated both clockwise and counterclockwise while holding the stage clamping knob.

★ A click may be heard and felt during rotation. However, this is due to the construction of the substage and does not indicate a malfunction.

Ⓞ The angle of rotation varies depending on the positions of the feed knobs.

	Angle of Rotation	
	Clockwise	Counterclockwise
Right-hand knobs	230°	20°
Left-hand knobs	20°	230°

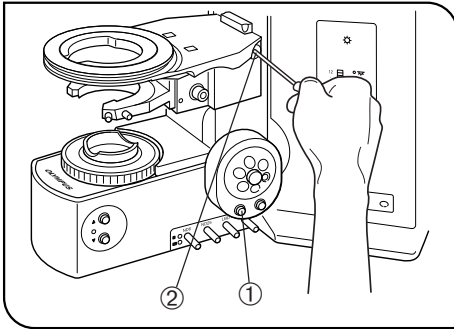


Fig. 22

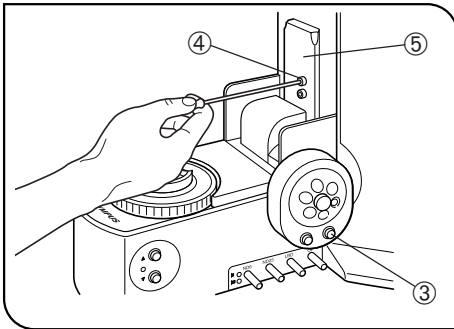


Fig. 23

**4 Adjusting the Stage Height** (Figs. 22 & 23)

Ⓞ By lowering the position of the substage, the microscope will accommodate specimens with maximum height of 35 mm. This is useful when observing metallurgical specimens and other thick objects.

1. Press the stage DOWN button ① to lower the stage to the lower limit, then remove the stage from the microscope.
2. Using an Allen screwdriver, loosen the substage bracket clamping screw ② and remove the substage.
3. Press the stage UP button ③ and raise the focusing block ⑤ to where the stopper screw ④ on the arm becomes visible.
4. Using the Allen screwdriver, loosen and remove the upper stopper screw ④.
5. Reattach substage bracket and stage.

Ⓞ Retain the removed stopper screw ④ and take care not to lose it.

## 3-4 Observation Tube

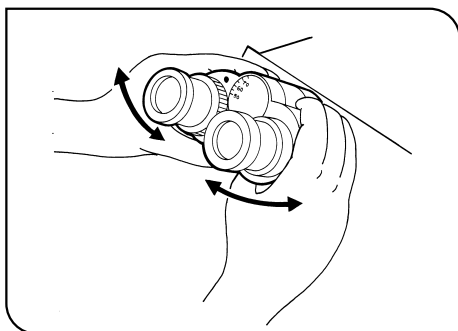


Fig. 24

### 1 Adjusting the Interpupillar Distance (Fig. 24)

While looking through the eyepieces, adjust for binocular vision until the left and right fields of view coincide completely. The index dot • indicates the interpupillary distance.

ⓈNote your interpupillary distance so that it can be quickly duplicated.

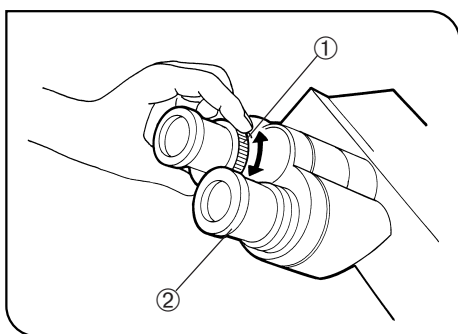


Fig. 25

### 2 Adjusting the Diopter (Figs 25 & 26)

1. Looking through the eyepiece without the diopter adjustment ring, rotate the coarse and fine focus adjustment knob to bring the specimen into focus.
2. Looking through the eyepiece with the diopter adjustment ring ①, turn it to focus on the specimen. (Fig. 25)

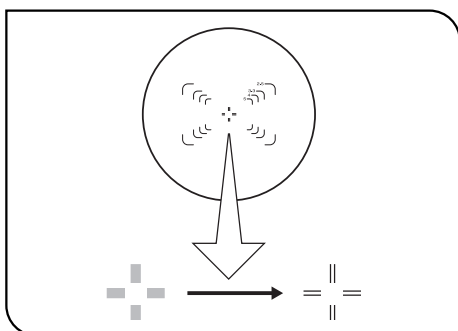


Fig. 26

#### Using a Finder Eyepiece

1. Looking through the right eyepiece with your right eye, turn the top of the eyepiece ② until a clearly defined double crossline can be seen in the field of view. (Figs. 25 & 26)
2. Looking through the right eyepiece, rotate the coarse and fine focus adjustment knob to bring the specimen and double crossline into simultaneous focus.
3. Looking through the left eyepiece with your left eye, turn the diopter adjustment ring ① to focus on the specimen.

#### Using an Super Widefield Observation Tube

The operation is similar to the above. However, as the super widefield tube does not have the diopter adjustment ring on the left sleeve, focus on the specimen by turning the top of the left sleeve.

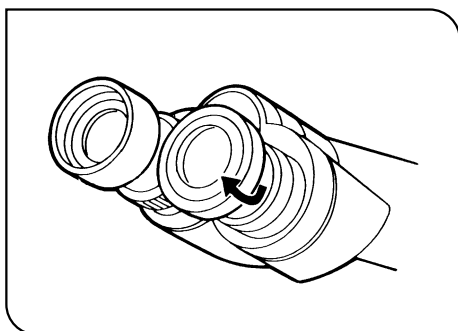


Fig. 27

### 3 Using the Eye Shades (Fig. 27)

#### When Wearing Eyeglasses

Use with the eye shades in the normal, folded-down position. This will prevent the eyeglasses from being scratched.

#### When Not Wearing Eyeglasses

Extend the folded eye shades in the direction of the arrow to prevent extraneous light from entering between the eyepieces and eyes.

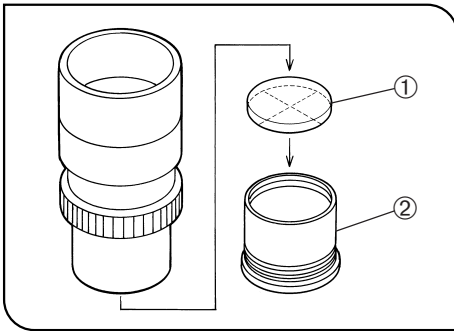


Fig. 28

**4 Using the Eyepiece Micrometer Disk (Fig. 28)**

When the WHN10X-H (or WHN10X) eyepieces are used, an eyepiece micrometer disk can be inserted in one of them. When the eyepiece does not have a diopter adjustment mechanism, however, it is hard to focus on the micrometer disk if the operator has poor eyesight. Should that be the case, adjust the focus with eyeglasses on.

Use 24 mm dia. x 1.5 mm thick micrometer disks.

Following Fig. 28, turn the built-in micrometer-mounting frame ② counterclockwise to remove it from the eyepiece and place a micrometer disk.

Screw the micrometer mounting frame back into the eyepiece sleeve.

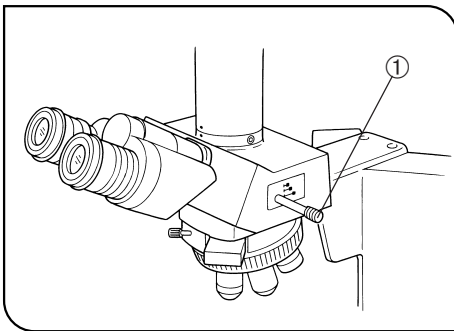


Fig. 29

**5 Selecting the Light Path of the Trinocular Tube (Fig. 29)**

Slide the light path selector knob ① to select the desired light path.

Trinocular tube	Light path selector knob position		
	Pushed in	Middle position	Pulled out
U-TR30-2	100% for binocular eyepieces	20% for binocular eyepieces, 80% for TV/photography	100% for TV/photography
U-SWTR-3		50% for binocular eyepieces, 50% for TV/photography	
U-TR30NIR*			

\*With the infrared trinocular tube, infrared observation up to 1000 nm is possible. For details, consult your Olympus representative.

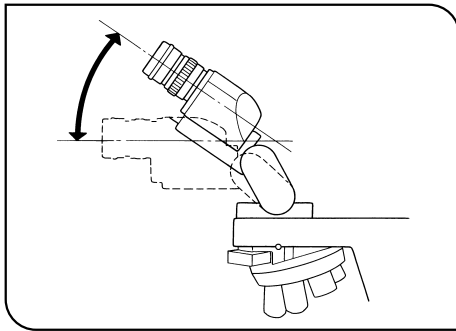


Fig. 30

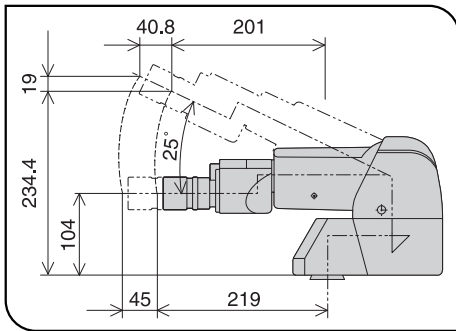


Fig. 31

## 6 Adjusting the Tilt (with the U-TBI3)

(Fig. 30)

- ⊙ Adjust the height and tilt of the observation tube to obtain the most comfortable viewing position.  
Holding the binocular section with both hands, raise or lower it to the desired position.
- ★ **Never attempt to force the binocular section past the upper or lower stop position. Applying excessive force could destroy the limiting mechanism.**
- ⊙ The U-TBI3 can be used in combination with only one intermediate attachment. However, no intermediate attachment can be combined when the BX-RFAA or BX-RLAA reflected light illuminator is used.
- ⊙ If you need photography using the U-TBI3, also use the U-TRU trinocular intermediate tube.

### With the U-ETBI/U-TTBI (Fig. 31)

The U-ETBI and U-TTBI are ergonomic observation tubes with normal field, capable of the tilting adjustment as well as the adjustment of the eyepiece position toward the front and rear (by 45 mm). The U-ETBI is the erect image model and the U-TTBI is the inverted image model, and both models are of the same size.

- ★ **The intermediate attachments that can be combined with the U-TTBI are limited. For details, please contact Olympus.**

### 3-5 Condenser

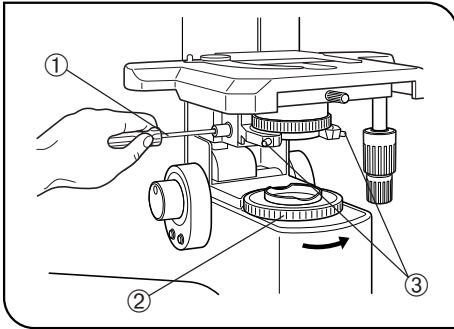


Fig. 32

#### 1 Centering the Condenser

(Figs. 32 & 33)

1. Fit the Allen screwdriver ① into the condenser height adjustment screw and turn the tool counterclockwise to raise the condenser to its upper limit.
2. Focus on the specimen using the 10X objective.
- ★ When using a swing-out condenser, move the top lens into the light path.
3. Rotate the field iris diaphragm ring ② in the direction of the arrow so that the diaphragm image comes inside the field of view.
4. Turn the Allen screwdriver ① to focus on the diaphragm image.
5. Fit the Allen screwdrivers into the two condenser centering screws ③ and turn them to move the iris diaphragm image to the center of the field of view.
6. Gradually open the field iris diaphragm. The condenser is properly centered if the iris image is centered and inscribed in the field of view.
7. During actual use, open the field diaphragm slightly until its image circumscribes the field of view.

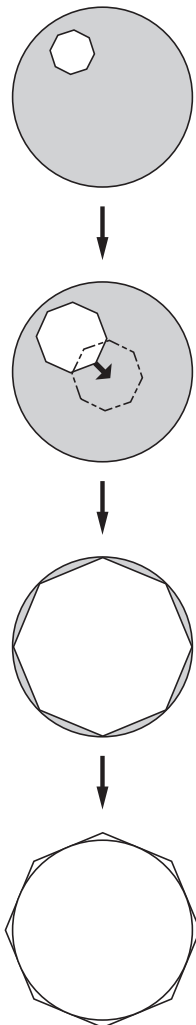


Fig. 33

#### Effects of Field Iris Diaphragm (Fig. 33)

The field iris diaphragm restricts the diameter of the beam of light entering the objective and thus excludes extraneous light, improving image contrast. The diameter of the field iris should be adjusted for objective power to the extent that it just circumscribes the field of view. (See "Compatibility of Objectives and Condensers" on the next page.)

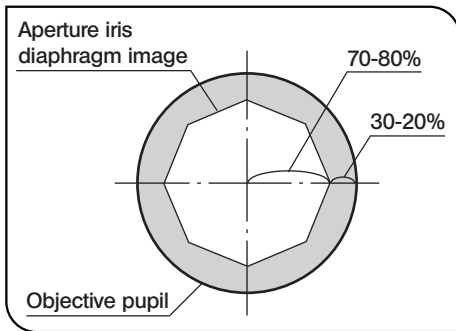


Fig. 34

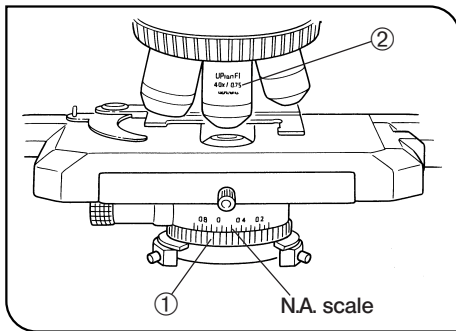


Fig. 35

#### Aperture Iris Diaphragm (Figs. 34 & 35)

- The aperture iris diaphragm determines the numerical aperture of the illumination system. It has an effect of adjusting image resolution and contrast. Stopping down the aperture iris diaphragm increases the depth of focus.
- Since the contrast of microscope specimens is ordinarily low, setting the condenser aperture iris diaphragm to between 70 and 80% of the N.A. ② of the objective in use is usually recommended. Adjust the ratio by removing the eyepiece and looking into the eyepiece sleeve while adjusting the aperture iris diaphragm ring ① until the image shown in Fig. 34 is seen.

② Using the numerical aperture scale:

You can use the condenser numerical aperture scale by adjusting the aperture iris diaphragm ring ①. (Fig. 35)

## 2 Compatibility of Objectives and Condensers

Objective Magnification	Condenser		
	Achromat/aplanat U-AAC	Swing-out U-SC3	Motorized universal U-UCD8A
1.25X	/	Applicable to FN 22	Applicable when U-FWCO1.25X is combined.
2X		Applicable (FN 26.5) by moving top lens out of the light path.*	Applicable (FN 26.5) by moving top lens out of the light path.
4X			
10-60X	Applicable (FN 26.5)	Engage top lens in light path. (FN 26.5)	Engage top lens in light path. (FN 26.5)
100X			

\* When using the U-SC3 swing-out condenser together with a 1.25X to 4X objective, fully open the condenser aperture iris diaphragm and use the field iris diaphragm in the base as aperture diaphragm. With the 1.25X to 2X objectives, the surroundings of the field of view may become dark.

② To obtain better illumination in photomicrography using a 1.25X to 4X objective, use of the U-ULC-2 for ultralow magnification is recommended.



### 3-6 Immersion Objectives

★ Be sure to use the provided Olympus Immersion oil.

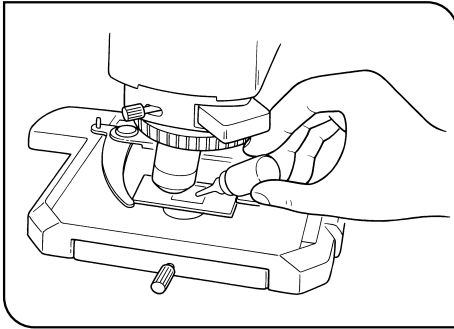


Fig. 36

#### 1 Using Immersion Objectives (Fig. 36)

1. Focus on the specimen using all objectives, starting from the lowest-power objective to higher-power objectives.
2. Press the stage escape button to lower the stage, then place a drop of provided immersion oil onto the specimen at the area to be observed.
3. Turn the revolving nosepiece to engage the immersion objective.
4. Press the stage escape button to raise the stage, then turn the focus adjustment knob to focus on the specimen.

★ Since air bubbles in the oil will affect the image quality, make sure that the oil is free of bubbles.

- a. To check for bubbles, remove the eyepiece and fully open the field and aperture iris diaphragms, then look at the exit pupil of the objective inside the observation tube. (The pupil should appear round and bright.)
  - b. To remove bubbles, turn the revolving nosepiece toward the shorter objectives and repeatedly defocus and refocus the oil immersion objective.
- Ⓞ If the condenser engraving shows a numerical aperture (NA) of 1.0 or higher, the number applies only when oil is applied between the slide glass and the top surface of the condenser. When oil is not present, the NA is about 0.9.
5. After use, remove oil from the objective front lens by wiping with gauze slightly moistened with absolute alcohol.

#### ▲ Caution in use of immersion oil

If immersion oil enters your eyes or contacts with your skin, immediately take the following treatment.

Eyes: Rinse with fresh water (for 15 minutes or more).

Skin: Rise with water and soap.

If the appearance of the eyes or skin is altered or pain persists, immediately see your doctor.

### 3-7 Objectives with Correction Collar

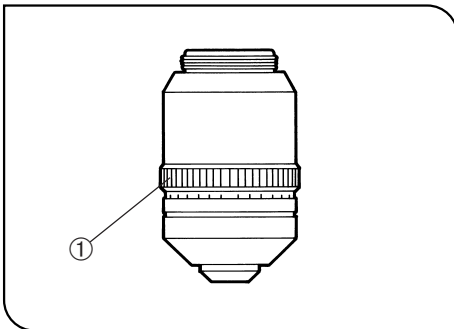


Fig. 37

Ⓞ If the cover glass thickness is not 0.17 mm, the objectives cannot manifest their performances. If a correction collar equipped objective is used in this case, the difference in thickness can be compensated for by adjusting the collar.

#### Adjustment Procedure

- If the cover glass thickness is known, set the correction collar ① to that value. (Fig. 37)
- If the cover glass thickness is unknown, adjust the correction collar ① and focus adjustment knob alternately until the positioning with the highest resolution is obtained.

★ Be careful not to touch the correction collar ① when turning the revolving nosepiece.

# 4 TROUBLESHOOTING GUIDE

Under certain conditions, performance of the unit may be adversely affected by factors other than defects. If problems occur, please review the following list and take remedial action as needed. If you cannot solve the problem after checking the entire list, please contact your local Olympus representative for assistance.

Problem	Cause	Remedy	Page
<b>1. Optical System</b>			
a) Bulb does not light.	Power cord of BX-UCB is unplugged.	Insert power plug firmly into power outlet.	-
	Main switch of BX-UCB is not on.	Set main switch to "I" (ON).	-
	Lamp ON-OFF switch on the base of BX61 is not on.	Set the lamp ON-OFF switch to ON.	-
	Bulb is burned out.	Replace bulb with a new specified bulb.	31
	Transmitted/reflected light switch is set to reflected light (☐).	Set the switch to ☐ (transmitted light illumination).	8
b) Bulb operates, but field of view remains dark.	Aperture and field iris diaphragms are not opened wide enough.	Adjust them to proper sizes.	19/20
	Condenser is lowered too much.	Adjust the condenser height position.	19
	Light path selector knob is set to the ☐ position.	Move the knob to the ☐ position.	17
c) Field of view is obscured or not evenly illuminated	Light path selector knob is in an positioned halfway.	Set the knob according to the observation method.	17
	Revolving nosepiece is not correctly engaged.	Make sure that the revolving nosepiece clicks properly into place.	-
	Condenser is not attached properly.	Re-attach it.	32
	Revolving nosepiece is not attached properly.	Push the side dovetail all the way until it is stopped.	-
	An objective that falls outside of the condenser's illumination range is used.	Use a condenser to match the purpose.	20
	Condenser is not properly centered.	Center the condenser.	19
	Field iris diaphragm is stopped down too far.	Open the field iris diaphragm until it circumscribes the field.	19
	Bulb is not mounted correctly.	Push the pins of halogen bulb all the way until the stop position.	31
d) Dirt or dust is visible in the field of view.	Dirt/dust on the eyepiece	Clean thoroughly.	3
	Dirt or the to surface of the condenser		
	Dirt/dust on the specimen		
e) Visibility is poor. • Image is not sharp. • Contrast is poor. • Details are indistinct. • Image glares.	A non-UIS2/UIS objective is used.	Use only UIS2/UIS series objectives with this microscope.	27/28
	Condenser is lowered too far.	Adjust the condenser height position.	19
	Aperture iris diaphragm is stopped down too far.	Open aperture iris diaphragm.	20
	Revolving nosepiece is not mounted properly.	Push the slide dovetail all the way until it is stopped.	-

Problem	Cause	Remedy	Page
e) Visibility is poor. <ul style="list-style-type: none"> <li>Image is not sharp.</li> <li>Contrast is poor.</li> <li>Details are indistinct.</li> <li>Image glares.</li> </ul>	Correction collar on correction collar equipped objective is not properly adjusted.	While focusing, turn the correction collar to find the best position.	21
	Front lens of objective is dirty.	Clean objective.	3
	Immersion oil is not being used with an oil immersion objective.	Use immersion oil.	21
	Immersion oil contains bubbles.	Remove the bubbles.	21
	Recommended immersion oil is not used.	Use the provided immersion oil.	21
	Dirt/dust on specimen.	Clean it.	3
	Dirt/dust on condenser		
Inappropriate object side or cover glass thickness.	Replace with glass of recommended thickness.	13	
f) One side of image is blurred.	Revolving nosepiece is not correctly mounted.	Push slide dovetail all the way until it is stopped.	-
	Stage is not correctly mounted.	Re-attach it.	15
	Objective is not correctly engaged in light path.	Make sure that revolving nosepiece clicks into place correctly.	-
	Specimen is not correctly mounted on stage.	Place specimen correctly on to of stage and secure it with slide holder.	13
g) Image appears to waver.	Revolving nosepiece is not corrected mounted.	Push slide dovetail all the way until it is stopped.	-
	Objective is not correctly engaged in light path.	Make sure that revolving nosepiece clicks into place correctly.	-
	Condenser is not properly centered.	Center the condenser.	19
h) Field of view becomes only slightly brighter when the voltage is raised.	Condenser is not properly centered.	Center the condenser.	19
	Condenser is lowered too far.	Adjust the condenser height position.	19
<b>2. Electrical System</b>			
a) Bulb intermittently lights and goes out.	Bulb is nearly burned out.	Replace bulb.	31
	A connector is not properly connected.	Check all connectors.	-
b) Bulb burns out almost immediately.	Wrong type of bulb is being used.	Use correct bulb type.	31
c) All voltage indicator LEDs light and voltage cannot be varied by pressing light intensity adjustment button.	Bulb is not installed.	Install bulb.	31
	Bulb is burned out.	Replace bulb.	31
	Lamp housing is not connected.	Connect lamp housing correctly.	-
d) Brightness does not change when you press light intensity adjustment button.	Bulb is burned out.	Replace bulb.	31
<b>3. Focusing Block</b>			
a) Image cannot be focused.	When adjusting stage height, you forgot to reattach upper stopper screw.	Re-attach upper stopper screw.	15
b) Stage rises too high and destroys specimen.	Substage is not installed properly.	Re-attach substage.	11

Problem	Cause	Remedy	Page
c) Coarse adjustment will not go all the way down.	Condenser holder is too low.	Raise condenser holder.	32
d) Objective makes contact with specimen before focus is obtained.	Specimen is mounted upside down.	Mount specimen correctly.	-
<b>4. Observation Tube</b>			
a) Field of view of one eye does not match that of the other.	Interpupillary distance is incorrect.	Adjust interpupillary distance.	16
	Incorrect diopter adjustment.	Adjust diopter.	16
	Different eyepieces are used on left and right.	Change on eyepiece to match the other so that both sides are the same type.	-
	Your view is not accustomed to microscope observation.	Upon looking into eyepieces, try looking at overall field before concentrating on specimen range. You may also find it helpful to look up and into distance for a moment before looking back into microscope.	-
<b>5. Stage</b>			
a) Image shifts when you touch stage.	Stage is not properly mounted.	Clamp stage.	-
b) Specimen stops midway on the X-axis traverse.	Specimen is not correctly positioned.	Place specimen correctly.	13
c) X-axis and/or Y-axis knobs are too tight or too loose.	X-axis and/or Y-axis adjustment knobs are set at a position where tension is too high or too low.	Adjust tension.	14
d) Stroke is decreased.	Stage guide is deviated.	Correct deviation as instructed on page 14.	14

# 5 SPECIFICATIONS

Item	Specification					
1. Optical system	UIS2/UIS (Universal Infinity System) optical system (featuring infinity correction)					
2. Illumination	Built-in transmitted Koehler illumination 12 V , 100 W long-life halogen bulb (pre-centered) 12 V 100 W HAL-L (PHILIPS 7724) or 12 V , 50 W long-life halogen bulb (pre-centered) 12 V 50 W HAL-L (LIFE JC) (Average life time: Approx. 2,000 hr. when used as directed) Light intensity voltage range: 2 V or less to 12.0 V (continuous) With a light intensity preset switch (voltage variation range: 2 V or less to 12.0 V ) Rated voltage of external power supply (BX-UCB): 100-120/220-240 V ~, 50/60 Hz, 3.5 A /1.5 A Power consumption (BX-UCB): 50-300 W (variable with number of connected modules) (Ex.) Approx. 200 W with 100 W halogen bulb and motorized focusing unit					
3. Focusing mechanism	Drive system: Motorized focusing using a stepping motor and ball screw. Stage height movement by cross roller guides. Finest adjustment scale: 1 μm (fine movement sensitivity 1 μm) Resolution: 0.01 μm Highest stage speed: 3 mm/sec. Stroke per rotation: 0.1 mm (fine), 1 mm (coarse) Full stroke range: 25 mm to 14 mm (when the U-FWT filter wheel is used)					
4. Revolving nosepiece	Manual revolving nosepieces: U-5RE-2, U-D6RE, U-D7RE, U-P6RE Motorized revolving nosepieces: U-D6REM, U-D5BDREM, U-D6REMC, U-D6BDREMC, U-D5BDREMC, U-P5REMC, U-P5BDREMC					
5. Observation tube	Type	U-BI30-2	U-TBI3	U-TR30-2	U-TR30NIR	U-SWTR-3
		Widefield bin-ocular tube	Widefield tilting binocular	Widefield trin-ocular tube	Super widefield trinocular	
	Field No.	22				26.5
	Tube inclination	30°	5°-35° continuous	30°		
	Interpupillary distance adjustment	50 mm to 76 mm				
Light path selector	None			3 steps: ① Bi 100% ② Bi 20%, Photo 80% ( Bi 50%, Photo 50% ) ( for U-TR30NIR only ) ③ TV, Photo 100%		
6. Stage	Type	U-SVRB-4		U-SVLB-4		
		Common-axis knobs on bottom right.		Common-axis knobs on bottom left.		
		Rectangular ceramic coated. wire driven stage				
	Size	156 mm (H) x 191 mm (W)				
	Movement mechanism	X/Y-axis knobs with adjustable tension. Movement range: 52 mm in Y-axis direction, 76 mm in X-axis direction.				
	Specimen holders (single slide holder)	U-HLST-4 (thick slide holder) U-HLS-4 (thin slide holder)				
Specimen holders (double slide holder)	U-HLDT-4 (left opening, thick slide holder) U-HLD-4 (left opening, thin slide holder)		U-HRDT-4 (right opening, thick slide holder) U-HRD-4 (right opening, thin slide holder)			

Item	Specification			
7. Condenser	Type	U-AAC Achromat/aplanat	U-SC3 Swing-out	U-UCD8A Motorized, achromat/ aplanat, swing-out
	NA	1.40	0.9 - 0.1	1.4 - 0.2
	Aperture iris diaphragm	With numerical aperture scale		
	Objective range	10X - 100X (for FN 26.5 super widefield)	1.25X (for FN 22 widefield), 2X - 100X (for FN 26.5 super widefield)	2X - 100X (for FN 26.5 super widefield)
8. Operating environment	<ul style="list-style-type: none"> <li>• Indoor use.</li> <li>• Altitude: Max. 2000 meters</li> <li>• Ambient temperature: 5° to 40°C (41° to 104° F)</li> <li>• Maximum relative humidity: 80% for temperatures up to 31°C (88°F), decreasing linearly through 70% at 34°C (93°F), 60% at 37°C (99°F), to 50% relative humidity at 40°C (104°F).</li> <li>• Supply voltage fluctuations; Not to exceed ±10% of the normal voltage.</li> <li>• Pollution degree: 2 (in accordance with IEC60664)</li> <li>• Installation/Overvoltage category: II (in accordance with IEC60664)</li> </ul>			

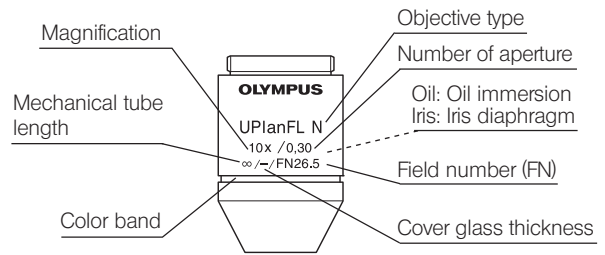
# 6 OPTICAL CHARACTERISTICS «UIS2 (UIS) Series»

— UIS series objectives not listed here can also be combined with this microscope. —

The following table shows the optical characteristics of combinations of eyepieces and objectives. The figure on the right shows the performance data engraved on the objectives.

**NOTE**

Refer to the latest catalogue or consult your local Olympus representative for the updated information on the eyepieces and objectives that can be combined with this microscope.



Objective	Optical character	Magnification	N.A.	W.D. (mm)	Cover glass thickness (mm)	Resolution (μm)	Eyepiece WHN10X (FN22)			Remark
							Total mag.	Depth of focus (μm)	Field of view	
UIS2 Series	PlanN-P Plan Achromat for polarized light (FN22)	4X	0.1	18.5	—	3.40	40X	180.0	5.5	
	AchN-P Achromat for polarized light (FN22)	10X	0.25	6.0	—	1.30	100X	28.0	2.2	
		20X	0.4	3.0	0.17	0.84	200X	9.3	1.1	
		40X	0.65	0.45	0.17	0.52	400X	2.0	0.55	
		100XO	1.25	0.13	—	0.27	1000X	0.69	0.22	
	PlanN Plan Achromat (FN22)	2X	0.06	5.8	—	5.59	20X	560.1	11.0	
		4X	0.1	18.5	—	3.36	40X	175.0	5.5	
		10X	0.25	10.6	—	1.34	100X	28.0	2.2	
		20X	0.4	1.2	0.17	0.84	200X	9.27	1.1	
		40X	0.65	0.6	0.17	0.52	400X	3.04	0.55	
50XOI		0.5-0.9	0.2	0.17	0.37	500X	1.7	0.44	Oil immersion/Iris	
UPlanFLN Plan Semi Apochromat (FN26.5)	100XO	1.25	0.15	0.15	0.27	1000X	0.69	0.22	Oil immersion	
	4X	0.13	17.0	—	2.58	40X	127.2	5.5		
	10X2	0.3	10.0	—	1.12	100X	22.4	2.2		
	20X	0.5	2.1	0.17	0.67	200X	7.0	1.1		
	40X	0.75	0.51	0.17	0.45	400X	2.52	0.55		
	40XO	1.3	0.2	0.17	0.26	400X	1.27	0.55	Oil immersion	
	60X	0.9	0.2	0.17	0.37	600X	1.5	0.37	Correction collar	
	60XOI	0.65-1.25	0.12	0.17	0.27	600X	0.98	0.37	Oil immersion/Iris	
UPlanSApo Plan Apochromat (FN26.5)	100XO2	1.30	0.2	0.17	0.26	1000X	0.66	0.22	Oil immersion	
	100XOI2	0.6-1.30	0.2	0.17	0.26	1000X	0.66	0.22	Oil immersion/Iris	
	4X	0.16	13.0	—	2.50	40X	99.6	5.5		
	10X2	0.4	3.1	0.17	0.84	100X	15.9	2.2		
	20X	0.75	0.6	0.17	0.45	200X	4.29	1.1		
	20XO	0.85	0.17	—	0.39	200X	3.5	1.1	Oil immersion	
	40X2	0.95	0.18	0.17	0.35	400X	1.9	0.55	Correction collar	
	60XW	1.2	0.28	0.17	0.28	600X	1.03	0.37	Water immersion	
PlanApoN Plan Apochromat (FN26.5)	60XO	1.35	0.15	0.17	0.25	600X	0.89	0.37	Oil immersion	
	100XO	1.4	0.13	0.17	0.24	1000X	0.59	0.22	Oil immersion	
	1.25X	0.04	5.0	—	8.39	125X	1326.8	176		
MPlanFLN Plan Semi Apochromat (FN26.5)	2X	0.08	6.2	—	4.19	20X	398.3	11.0		
	60XO	1.42	0.15	0.17	0.24	600X	0.83	0.37	Oil immersion	
	40X	0.75	0.63	0	0.45	400X	1.7	0.55		
MPlanApoN No Cover Plan Apochromat (FN26.5)	100XO	1.40	0.10	0	0.24	1000X	0.59	0.22	Oil immersion	

Optical character Objective		Magnification	N.A.	W.D. (mm)	Cover glass thickness (mm)	Resolution ( $\mu\text{m}$ )	Eyepiece WHN10X (FN22)			Remark
							Total mag.	Depth of focus ( $\mu\text{m}$ )	Field of view	
UIS Series	PlanFl Plan Semi Apochromat (FN26.5)	100X	0.95	0.20	0.14-0.20	0.35	1000X	1.0	0.22	Correction collar
	UApo Apochromat (FN22)	20X3/340	0.75	0.55	0.17	0.45	200X	4.3	1.1	
		20XW3/340	0.70	0.40	0.17	0.48	200X	4.08	1.1	
		40X3/340	0.90	0.20	0.11-0.23	0.37	400X	2.0	0.55	Correction collar
		40XW3/340	1.15	0.26	0.13-0.25	0.29	400X	1.29	0.55	Correction collar
40XOI3/340	0.65-1.35	0.10	0.17	0.25	400X	1.2	0.55	Oil immersion/Iris		



# 7 ASSEMBLY



## 7-1 Assembly Diagram

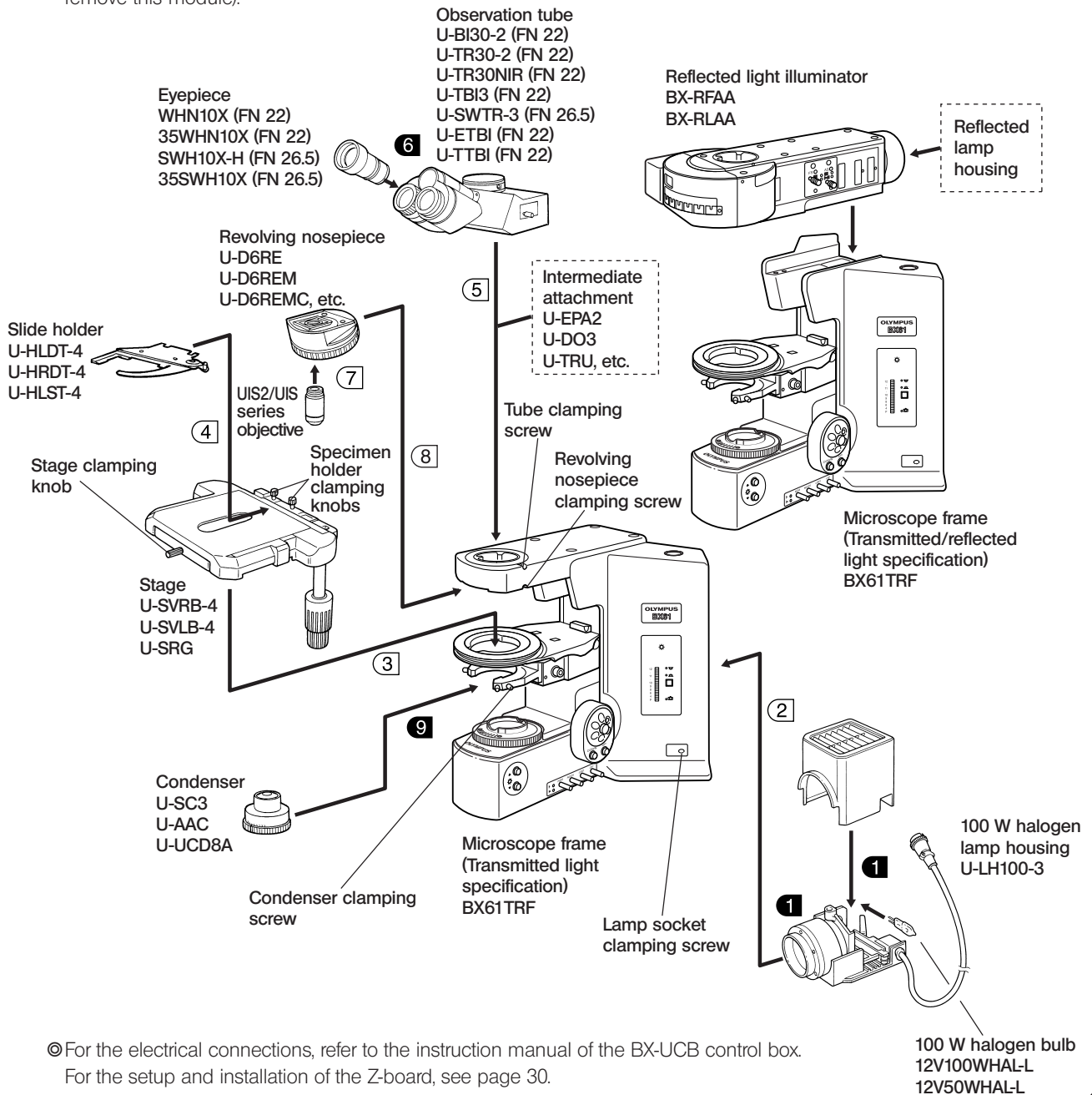
The diagram below shows the sequence of assembly of the various modules. The numbers indicate the order of assembly. The BX61TRF microscope frame is assembled in the same procedures.

The module model numbers shown in the following diagram are merely the typical examples. For the modules with which the model numbers are not given, please consult your Olympus representative or the catalogues.

★ When assembling the microscope, make sure that all parts are free of dust and dirt, and avoid scratching any parts or touching glass surfaces.

Assembly steps enclosed in **■** will be detailed on the subsequent pages.

© Most assembly operations are possible by using the Allen screwdriver (  ) provided with the microscope. However, the assembly of the reflected light illuminator requires the use of the provided Allen wrench (  ) for clamping the internal screws (to ensure the performance, we recommend that you have your Olympus representative assemble or remove this module).



## 7-2 Detailed Assembly Procedures

★ For use in focusing control, only either the Z-board or AF control board can be installed on the BX-UCB. Installing different boards on it may result in malfunction. When using the AF control board instead of the Z-board, set the on-board DIP switches on the AF control board to the same settings as the following settings that are originally intended for the Z-board.

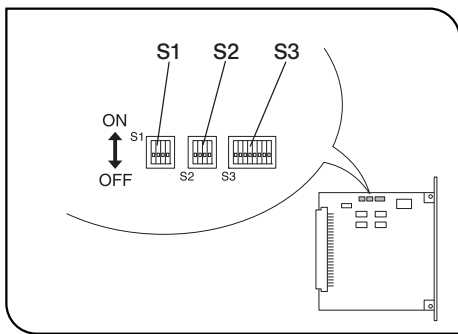


Fig. 38

### Setup and Installation of the Z-Board

Ⓞ The on-board DIP switches on the Z-board have been set up for the BX61 or BX62 (all of switches S1, S2 and S3 are set to OFF).

### Changing the Settings of On-Board DIP Switches (Fig. 38)

★ Leave all other DIP switches than those mentioned below in the OFF positions.

Ⓞ Switch only the DIP switches mentioned below to the ON positions.

#### S2 No. 4

- This replaces the functions of the F/C switching and stage escape buttons on the left side of the BX61/BX62 with the stage DOWN and UP buttons.

#### S3 No. 1

- This turns off the automatic initialization and sets the remote mode which is the default.

#### S3 No. 4

- When the U-FWT filter wheel is not used, this changes the focus adjustment stroke from 15 mm to 25 mm.

Ⓞ When the U-LWUCD long-WD universal condenser is used, set this to the OFF position.

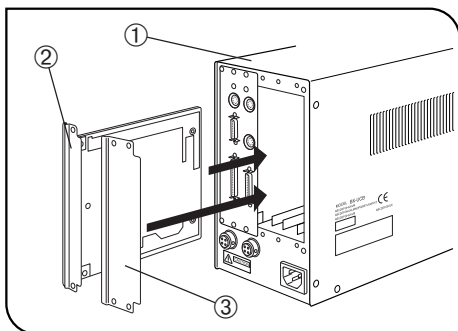


Fig. 39

### Mounting the Z-Board (Fig. 39)

Ⓞ Be sure to set the main switch on the BX-UCB control box ① to "○" (OFF) before proceeding to mounting the Z-board.

1. Loosen the 6 clamping knobs on the 2 option slot covers on the rear of the BX-UCB and remove the covers and knobs.

2. Insert the Z-board ② into the BX-UCB by aligning the orientation of the connector inside the BX-UCB and that of the Z-board. Push in the board along the board rails all the way so that the connector is plugged in securely.

3. Clamp the Z-board ② using two of the clamping knobs removed above. Also attach one of the removed covers ③ using the other four clamping knobs removed above.

Ⓞ Store the other, removed cover in a safe place.

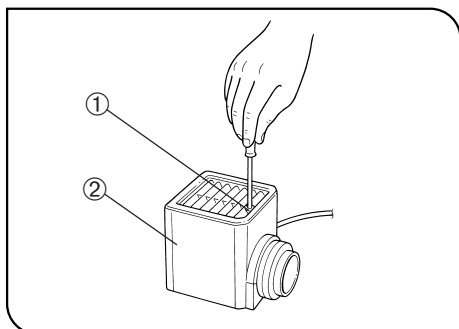


Fig. 40

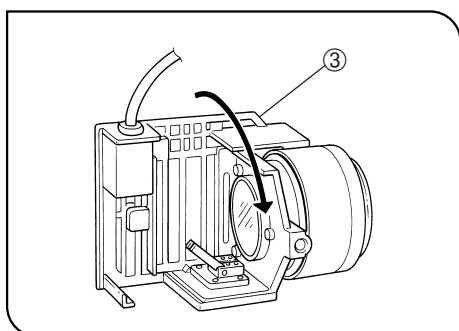


Fig. 41

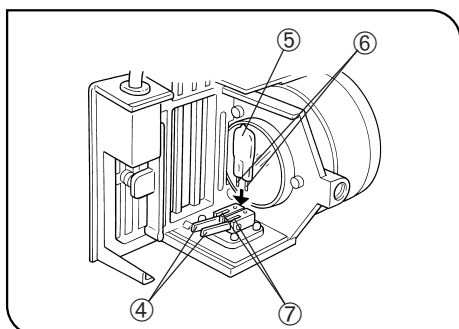


Fig. 42

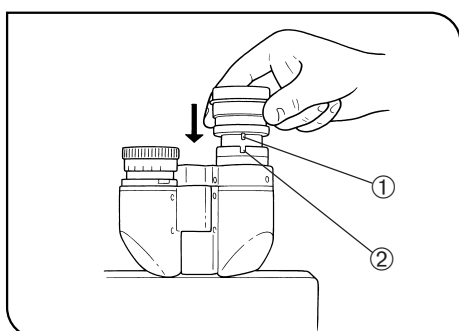
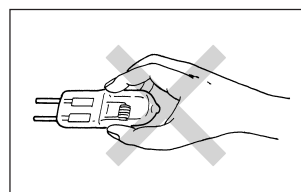


Fig. 43

**1 Installing the Halogen Bulb** (Figs. 40 - 42)

Ⓞ Use only the designated bulb 12V100WHAL-L (PHILIPS 7724) or 12V50WHAL-L (LIFE JC).

1. Fully loosen the lamp housing clamping screw ① on top of the lamp housing cover with the provided Allen screwdriver.
2. Lift the lamp housing cover ② upward to remove it.
3. Turn the lamp socket ③ by 90° in the direction indicated by the arrow.
4. Holding the bulb ⑤ with gloves or a piece of gauze, depress the bulb clamping lever ④ and insert the bulb pins ⑥ fully into the sections ⑦ as far as they will go.  
Gently release the bulb clamping lever to the original position to secure 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.

5. Slide the lamp housing cover onto the housing base from the above. Tighten the clamping screw ① while pressing downward on the cover. (Fig. 40)

**▲ Caution for Bulb Replacement During Use or Right After Use**

The bulb, lamp socket and areas near these will be extremely hot during and right after use.

Set the main switch to "O" (OFF), disconnect the power cord from the wall outlet, then allow the old bulb and lamp housing to cool before replacing the bulb with a new of the designated type.

**6 Attaching the Eyepiece** (Fig. 43)

Fit the eyepiece into each sleeve as far as it goes.

- ★ When using the U-BI30-2 binocular tube, eyepiece with built-in micrometer disk cannot be attached.
- ★ When using a finder eyepiece or an eyepiece with focusing mirror, attach it to the right-hand eyepiece sleeve.  
When doing so, make sure that the eyepiece positioning pin ① fits into the notch ② on the eyepiece sleeve.
- ★ The super-widefield trinocular observation tube is equipped with a positioning notch on both eyepiece sleeves. Make sure that the positioning pins on both eyepieces fits into the respective notches.

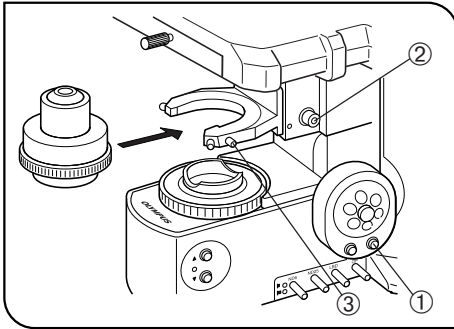


Fig. 44

## 9 Attaching the Condenser

(Fig. 44)

⊙ This operation necessitates the operation of the motorized focusing. Connect the cables and set the main switch to "I" (ON) before proceeding to the following.

1. Press the stage UP button ① to raise the stage to its upper limit.
2. Fit the Allen screwdriver into the condenser height adjustment screw ② and turn the tool counterclockwise to lower the condenser to its lower limit.
3. Fully loosen the condenser clamping screw ③ using the Allen screwdriver.

⊙ When attaching the U-SC3 swing-out condenser, align the positioning pin at the back of the condenser with the groove in the condenser sleeve.

★ **When attaching a condenser with swing-out top lens, swing out the top lens out of the way before inserting the condenser.**

4. Position the condenser so that the aperture scale or optical device indication plate is located in front. Gently slide the condenser along the dovetail all the way until it is stopped.
5. Tighten the condenser clamping screw ③ and gently raise the condenser holder to its highest position.

## ■ PROPER SELECTION OF THE POWER SUPPLY CORD

If no power supply cord is provided, please select the proper power supply cord for the equipment by referring to “ Specifications ” and “ Certified Cord ” below:




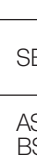















**CAUTION:** In case you use a non-approved power supply cord for Olympus products, Olympus can no longer warrant the electrical safety of the equipment.

### Specifications

Voltage Rating	125V AC (for 100-120V AC area) or, 250V AC (for 220-240V AC area)
Current Rating	6A minimum
Temperature Rating	60°C minimum
Length	3.05 m maximum
Fittings Configuration	Grounding type attachment plug cap. Opposite terminates in molded-on IEC configuration appliance coupling.

**Table 1 Certified Cord**

A power supply cord should be certified by one of the agencies listed in Table 1 , or comprised of cordage marked with an agency marking per Table 1 or marked per Table 2. The fittings are to be marked with at least one of agencies listed in Table 1. In case you are unable to buy locally in your country the power supply cord which is approved by one of the agencies mentioned in Table 1, please use replacements approved by any other equivalent and authorized agencies in your country.

Country	Agency	Certification Mark	Country	Agency	Certification Mark
Argentina	IRAM		Italy	IMQ	
Australia	SAA		Japan	JET, JQA, TÜV, UL:APEX / MITI	
Austria	ÖVE		Netherlands	KEMA	
Belgium	CEBEC		Norway	NEMKO	
Canada	CSA		Spain	AEE	
Denmark	DEMKO		Sweden	SEMKO	
Finland	FEI		Switzerland	SEV	
France	UTE		United Kingdom	ASTA BSI	
Germany	VDE		USA	UL	
Ireland	NSAI				

**Table 2 HAR Flexible Cord**

APPROVAL ORGANIZATIONS AND CORDAGE HARMONIZATION MARKING METHODS

Approval Organization	Printed or Embossed Harmonization Marking (May be located on jacket or insulation of internal wiring)		Alternative Marking Utilizing Black-Red-Yellow Thread (Length of color section in mm)		
			Black	Red	Yellow
Comite Electrotechnique Belge (CEBEC)	CEBEC	<HAR>	10	30	10
Verband Deutscher Elektrotechniker (VDE) e.V. Prüfstelle	<VDE>	<HAR>	30	10	10
Union Technique de l'Electricite' (UTE)	USE	<HAR>	30	10	30
Instituto Italiano del Marchio di Qualita' (IMQ)	IEMMEQU	<HAR>	10	30	50
British Approvals Service for Electric Cables (BASEC)	BASEC	<HAR>	10	10	30
N.V. KEMA	KEMA-KEUR	<HAR>	10	30	30
SEMKO AB Svenska Elektriska Materielkontrollanstalter	SEMKO	<HAR>	10	10	50
Österreichischer Verband für Elektrotechnik (ÖVE)	<ÖVE>	<HAR>	30	10	50
Danmarks Elektriske Materialkontroll (DEMKO)	<DEMKO>	<HAR>	30	10	30
National Standards Authority of Ireland (NSAI)	<NSAI>	<HAR>	30	30	50
Norges Elektriske Materielkontroll (NEMKO)	NEMKO	<HAR>	10	10	70
Asociacion Electrotecnica Y Electronica Espanola (AEE)	<UNED>	<HAR>	30	10	70
Hellenic Organization for Standardization (ELOT)	ELOT	<HAR>	30	30	70
Instituto Portages da Qualidade (IPQ)	np	<HAR>	10	10	90
Schweizerischer Elektro Technischer Verein (SEV)	SEV	<HAR>	10	30	90
Elektriska Inspektoratet	SETI	<HAR>	10	30	90

Underwriters Laboratories Inc. (UL)  
Canadian Standards Association (CSA)

SV, SVT, SJ or SJT, 3 X 18AWG  
SV, SVT, SJ or SJT, 3 X 18AWG



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