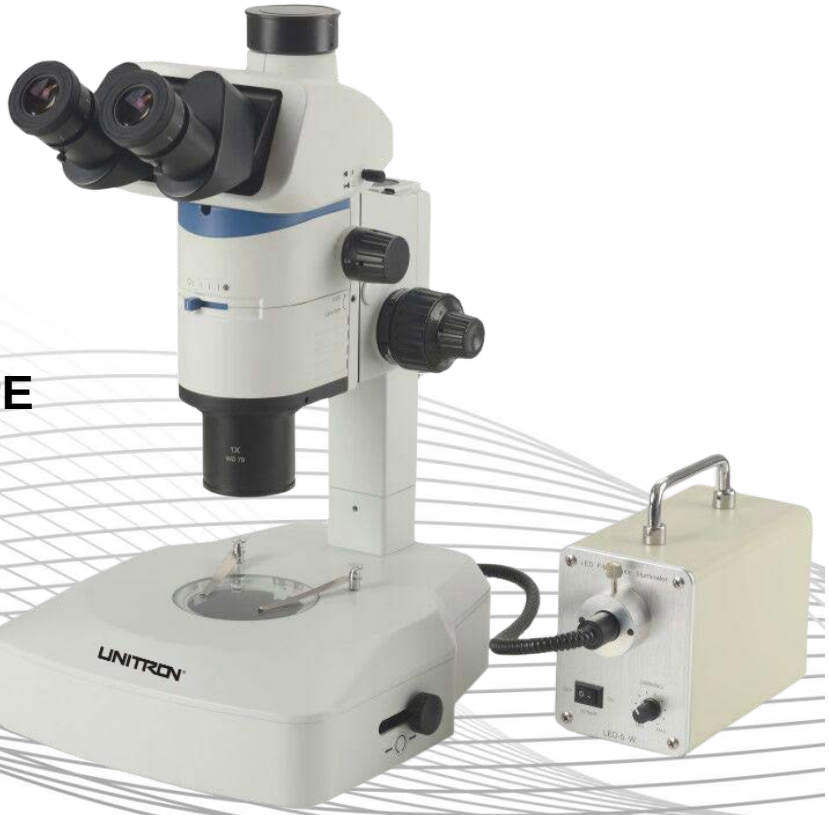
UNITRON®

Z12

STEREO MICROSCOPE

MANUAL



New York Microscope Company
Microscope Experts since 1979

100 Lauman Lane, Suite A, Hicksville, NY 11801
Tel: (877) 877-7274 | Fax: (516) 801-2046
Email: Info@nyscopes.com
www.microscopeinternational.com

CONTENTS

SAFETY NOTES

1. Open the shipping carton carefully to prevent any accessory, i.e. objectives or eyepieces, from dropping and being damaged.
2. Do not discard the molded shipping carton; the container should be retained should the microscope ever require reshipment.
3. Keep the instrument out of direct sunlight, high temperature or humidity, and dusty environments. Ensure the microscope is located on a smooth, level and firm surface.
4. If any specimen solutions or other liquids splash onto the stage, objective or any other component, disconnect the power cord immediately and wipe up the spillage. Otherwise, the instrument may be damaged.
5. All electrical connectors (power cord) should be inserted into an electrical surge suppressor to prevent damage due to voltage fluctuations.
6.  **LAMP REPLACEMENT -- CAUTION**: the glass housing of the lamp may be extremely hot. DO NOT attempt to change the lamp before it is completely cooled or without wearing adequate skin protection.
7.  **FUSE REPLACEMENT** -- For safety when replacing the fuse (ONLY replace with the same size, type and rating of original fuse), be sure the main switch is in the off position, disconnect the power cord from outlet, and replace the fuse. Reconnect the power cord and turn unit on.
8. Confirm that the input voltage indicated on your microscope corresponds to your line voltage. The use of a different input voltage other than indicated will cause severe damage to the microscope.

CARE AND MAINTENANCE

1. Do not attempt to disassemble any component including eyepieces, objectives or focusing assembly.
2. Keep the instrument clean; remove dirt and debris regularly. Accumulated dirt on metal surfaces should be cleaned with a damp cloth. More persistent dirt should be removed using a mild soap solution. Do not use organic solvents for cleansing.
3. The outer surface of the optics should be inspected and cleaned periodically using an air stream from an air bulb. If dirt remains on the optical surface, use a soft cloth or cotton swab dampened with a lens cleaning solution (available at camera stores). All optical lenses should be swabbed using a circular motion. A small amount of absorbent cotton wound on the end of a tapered stick such as cotton swabs or Q-tips, makes a useful tool for cleaning recessed optical surfaces. Avoid using an excessive amount of solvents as this may cause problems with optical coatings or cemented optics or the flowing solvent may pick up grease making cleaning more difficult.
4. Store the instrument in a cool, dry environment. Cover the microscope with the dust cover when not in use.
5. UNITRON® microscopes are precision instruments which require periodic preventative maintenance to maintain proper performance and to compensate for normal wear. An annual schedule of preventative maintenance by qualified personnel is highly recommended. Your authorized UNITRON® distributor can arrange for this service.

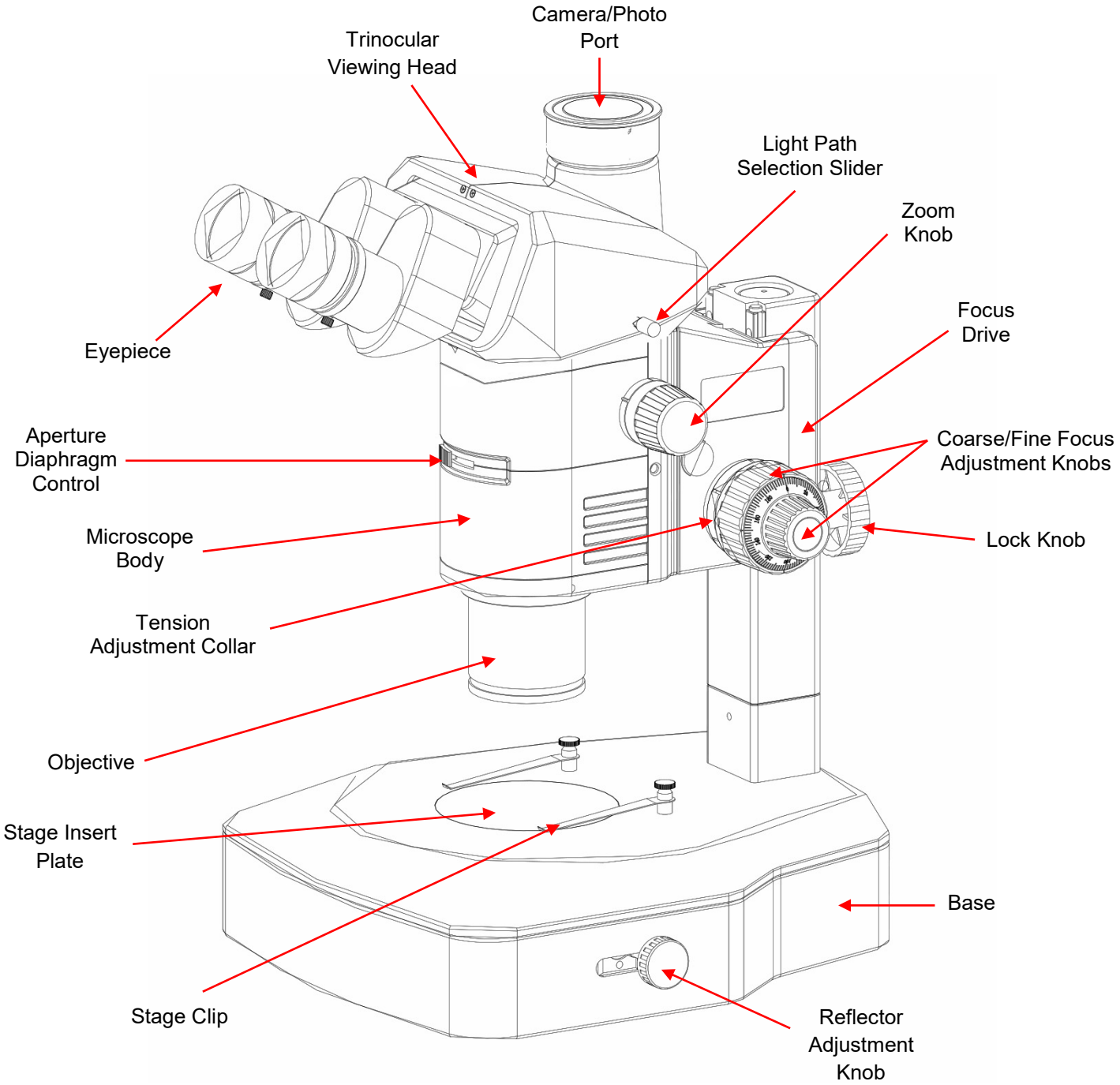
INTRODUCTION

Congratulations on the purchase of your new UNITRON® microscope. UNITRON® microscopes are engineered and manufactured to the highest quality standards. Your microscope will last a lifetime if used and maintained properly. UNITRON® microscopes are carefully assembled, inspected and tested by our staff of trained technicians in our New York facility. Careful quality control procedures ensure each microscope is of the highest quality prior to shipment.

UNPACKING AND COMPONENTS

Your microscope arrived packed in a molded shipping carton. ***Do not discard the carton*:** the carton should be retained for reshipment of your microscope if needed. Avoid placing the microscope in dusty surroundings or in high temperature or humid areas as mold and mildew will form. Carefully remove the microscope from the EPE foam container by its arm and base and place the microscope on a flat, vibration-free surface. Check the components against the packing list included with your microscope.

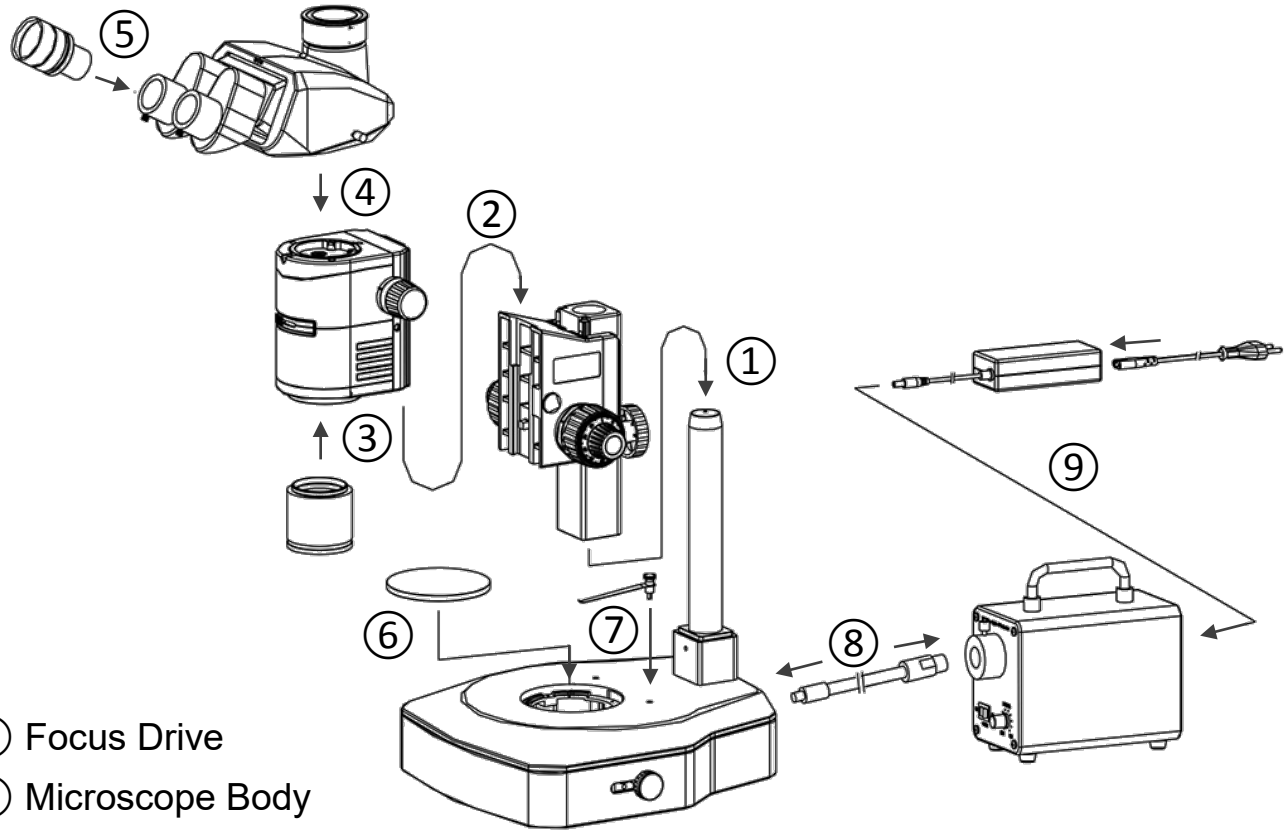
COMPONENTS DIAGRAM



ASSEMBLY DIAGRAM

The diagram below shows how to assemble the various components. The numbers indicate the order of assembly. Use the 1.5mm and 3mm hex wrenches that are supplied with your microscope when required. Be sure to keep this wrench for changing out components or making adjustments.

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



① Focus Drive
② Microscope Body
③ Objective
④ Trinocular Viewing Head
⑤ Eyepieces
⑥ Stage Insert Plate
⑦ Stage Clips
⑧ Illuminator Light Guide
⑨ Illuminator Power Cord

DETAILED ASSEMBLY

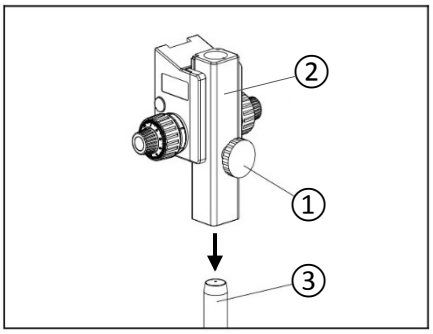


Fig. 1

Mount the Focus Drive (Fig. 1-2)

Loosen the lock knob ① of the focus drive ②. Position the focus drive as shown and gently slide it all the way down onto the column pole ③ until the bottom of the focus drive is flush with the column base ④, Fig. 2.

Tighten the lock knob.

WARNING: the focus drive **MUST** be mounted correctly as shown in Fig. 2. Mounting it improperly will result in the microscope tipping over which may cause damage.

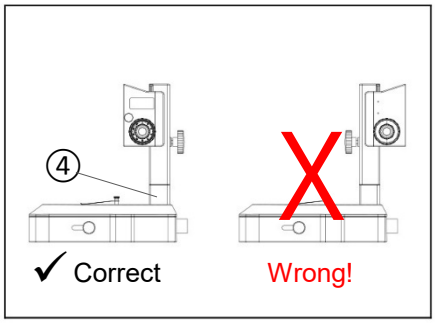


Fig. 2

Mount the Microscope Body (Fig. 3)

Remove the access cap ① on the side of the focus group and loosen the screw inside with a 3mm hex wrench.

Carefully slide the microscope body ② onto the dovetail interface ③ of the focus group as shown.

Tighten the lock screw on the focus group and replace the access cap.

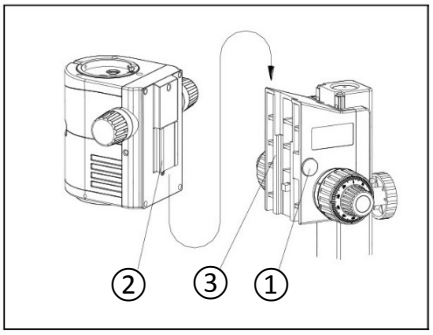


Fig. 3

Install the Objective (Fig. 4)

Carefully position and screw the objective ① into the bottom ② of the microscope body by rotating it clockwise as shown until it stops.

DO NOT force it on or overtighten it.

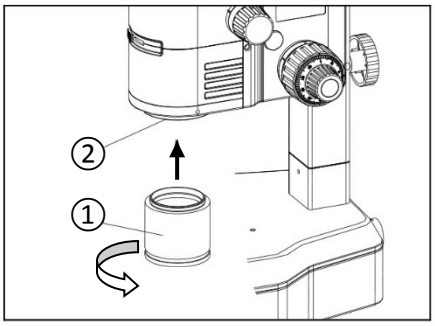


Fig. 4

DETAILED ASSEMBLY - *continued*

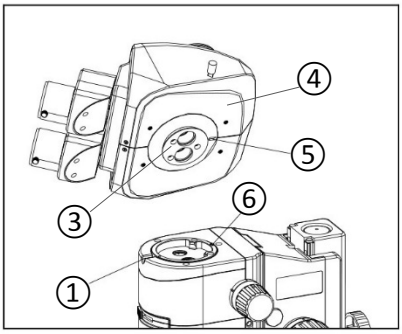


Fig. 5

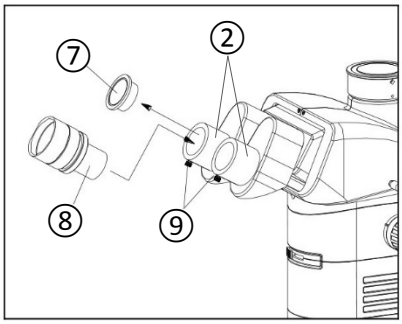


Fig. 6

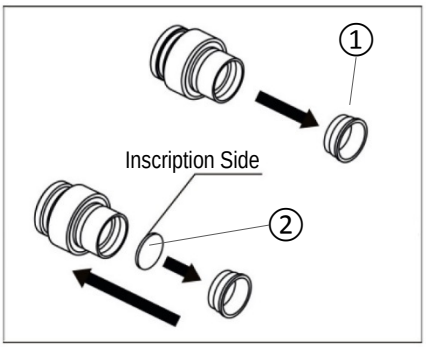


Fig. 7

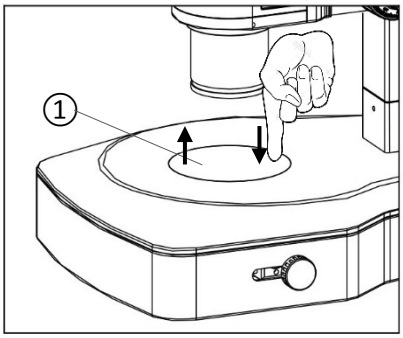


Fig. 8

Mount the Viewing Head (Fig. 5-6)

Loosen the lock screw ① on the front of the microscope body with the 3mm mm hex wrench.

With the eyepiece tubes ② facing forward (as shown in Fig. 6), carefully slide the dovetail ③ (Fig. 5) on the bottom of the viewing head ④ (Fig. 5) onto the dovetail mount on the top of the microscope body by aligning the orientation groove ⑤ with the orientation pin ⑥ of the microscope body. Make sure it is seated properly (it should be level and not wobble), then tighten the lock screw.

Install the Eyepieces (Fig. 6)

Remove the eyetube caps ⑦ and insert the eyepieces ⑧ into the eyepiece tubes ②.

Lock in the eyepieces by tightening the thumbs screws ⑨ on each eyepiece tube.

Mount/Unmount the Eyepiece Reticle (Fig. 7)

To mount the reticle: unscrew the mounting ring ① from the eyepiece by turning it counterclockwise.

Clean the reticle ② and insert it into the mounting ring with the inscription side as shown.

Screw the mounting ring back onto the eyepiece.

To remove the reticle: unscrew the mounting ring from the eyepiece, then carefully take out the reticle and wrap it in clean, soft, lint-free paper for storage.

Screw the mounting ring back onto the eyepiece.

Install the Stage Insert Plate (Fig. 8)

Gently push the stage insert plate ① with the edge tilted toward the spring on the inside of the hole in the base and set it into place.

To remove the stage insert plate, press down with one finger near the spring – it will pop up on the opposite side and you can then lift it out.

DETAILED ASSEMBLY - *continued*

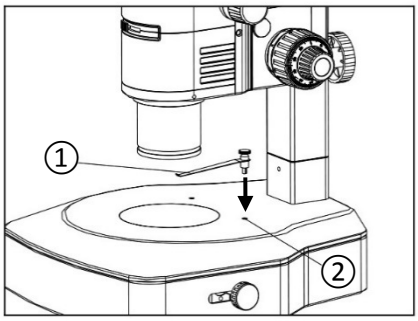


Fig. 9

Install the Stage Clips (Fig. 9)

Insert the stage clip post of the stage clip ① into the hole ② on the top of the base as shown; repeat for other stage clip.

Connect the LED Illuminator & Power Supply (Fig. 10)

Make sure the power switch on the illuminator ① is set to "OFF".

Align the end of the flat part of the illuminator light guide ② with the lock screw ③ on the socket ④ on the front of the illuminator and slide it in and tighten the lock screw.

Insert the other end of the illuminator light guide into the socket ⑤ on the back of the microscope and tighten the lock screw on the top of the socket.

Insert one end ⑥ of the power cord on the power supply ⑦ into the socket ⑧ on the back of the illuminator.

Plug the other end ⑨ into the corresponding socket on the other end of the power supply.

Plug the other end of the power supply into a grounded (3-prong) outlet.

NOTE: Always use the power cord that is provided with your microscope; using a different power cord may damage your microscope. Should you need a replacement, contact your authorized UNITRON dealer or call UNITRON at 1-631-543-2000 for a dealer nearest you.

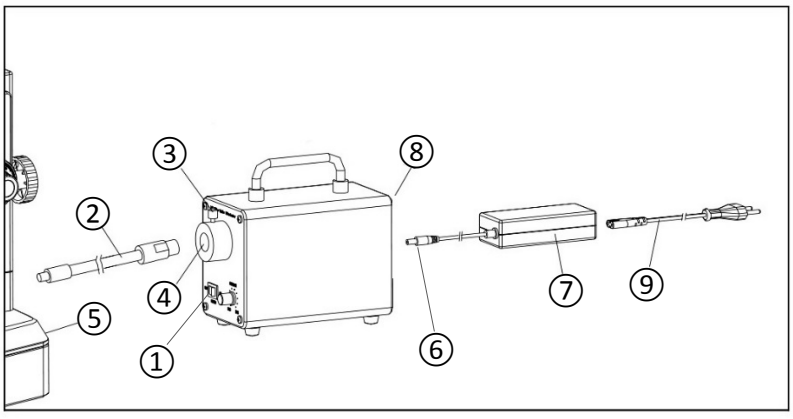


Fig. 10

OPERATION

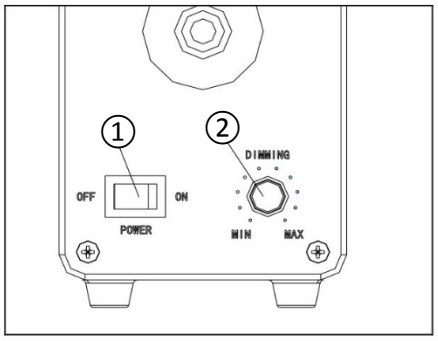


Fig. 11

Adjusting the Illumination (Fig. 11)

Turn the power switch ① to “ON”.

NOTE: For longer lamp life always turn the light intensity control knob ② to the lowest illumination intensity setting possible before turning the power on or off.

The light level may need adjustment depending upon the specimen density and objective magnification. Adjust the light intensity for comfortable viewing by turning the light intensity control knob clockwise to increase brightness. Turn counterclockwise to decrease brightness.

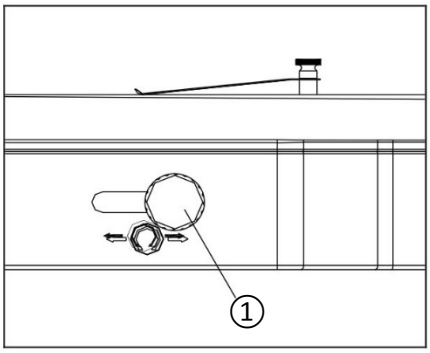


Fig. 12

Adjusting the Reflector (Fig. 12)

The reflector has two sides: one is a plane mirror, the other is sandblasted aluminum. Both sides reflect light but the plane mirror is provides a stronger reflection.

You can change the reflector type or the reflection intensity by rotating the reflector adjustment knob ①.

The reflector adjustment knob can also be moved from front to back to achieve different lighting effects of the reflector.

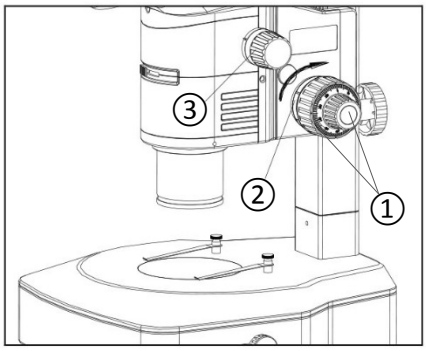


Fig. 13

Adjusting the Focusing Tension (Fig. 13)

If the feel is very heavy when focusing with the focusing knobs ①, or the specimen leaves the focus plane after focusing, adjust the tension with the tension adjustment ring ②.

Turn the tension adjustment ring clockwise to tighten or counterclockwise to loosen according to user preference.

OPERATION *(continued)*

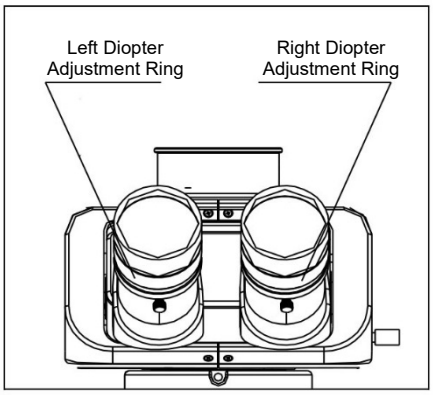


Fig. 14

Adjusting the Diopter & Focus (Fig. 14)

Set the dioptor rings of both eyepieces to “0” position. (Do this when users change, because different users will have different diopter settings.)

Place an easy-to-observe specimen on the stage plate, i.e., a coin.

Rotate the zoom knob to the highest magnification, then turn the focusing knob to focus the specimen.
Rotate the zoom knob to the lowest magnification, looking only into the left eyepiece, adjust the diopter ring on left eyepiece to focus the specimen.

Repeat procedure for the right eyepiece.

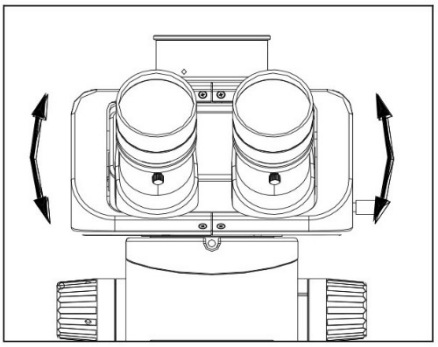


Fig. 15

Adjusting Interpupillary Distance (Fig. 15)

To adjust the interpupillary distance, hold the left and right eyetubes while observing a specimen. Rotate the eyetubes around the central axis until the fields of view of both eyetubes coincide completely. A complete circle should be seen in the viewing field when viewing the specimen slide. An improper adjustment will cause operator fatigue and will disrupt the objective parfocality.

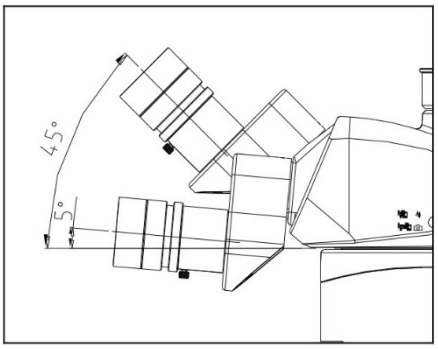


Fig. 16

Adjusting the Viewing Angle (Fig. 16)

To adjust the viewing angle, hold the eyepiece tubes with both hands and move them up or down to the position that feels most comfortable.

The angle can be adjusted from 5° to 45°.

OPERATION *(continued)*

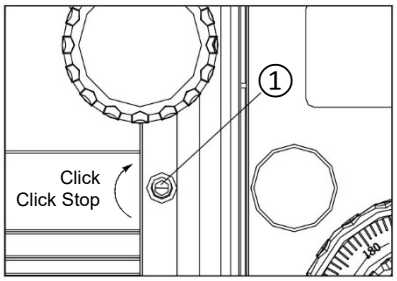


Fig. 17

Changing the Click/Click Stop Feature (Fig. 17)

The microscope is equipped with a Click/Click Stop feature that enables the user to set the magnification value indicated on the zoom knob to stop at each fixed magnification and will make a “click” sound, or to finely adjust the zoom magnification.

To turn on the Click feature to click at each magnification value, using a 3mm hex wrench, turn the Click/Click Stop screw ① clockwise as shown by the arrow in Fig. 17.

To turn on the Click Stop feature to finely adjust the zoom magnification, using a 3mm hex wrench, turn the Click/Click Stop screw ① counterclockwise.

NOTE: Be careful not to overturn the screw for either position as it may result in damage to the housing and internal mechanisms of the microscope.

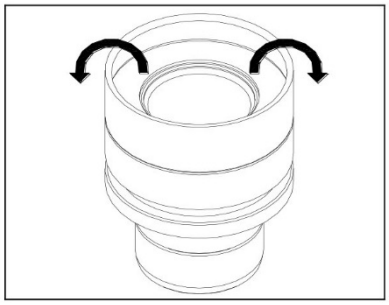


Fig. 18

Adjusting the Eyepiece Eyeguards (Fig. 18)

The eyepieces come standard with roll-down eyeguards.

The eyeguards should be rolled down ① for users wearing eyeglasses to prevent them from being too far from observing through the eyepieces. Or, not rolled down ② for those who don’t wear glasses to prevent extraneous light from entering the eyepiece which may interfere with specimen observation.

OPERATION *(continued)*

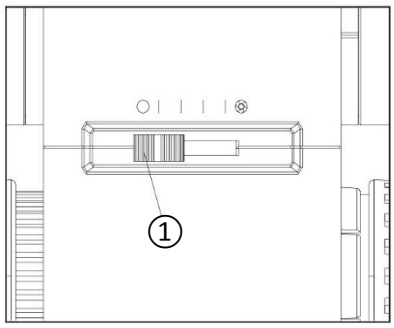


Fig. 19

Adjusting the Aperture Diaphragm (Fig. 19)

Adjust the aperture diaphragm by the aperture diaphragm control ①.

To enlarge the aperture diaphragm, slide the control to the left until the desired contrast of the observed image is achieved.

To decrease the aperture diaphragm, slide the control to the right until the desired contrast of the observed image is achieved.

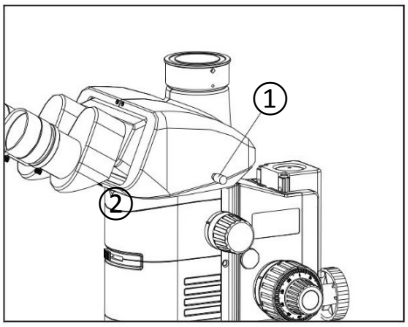


Fig 20

Selecting the Light Path (Fig. 20)

The Z12 is outfitted with a binocular viewing head with one photo port for HDMI/digital imaging. You must select the appropriate light path for observing specimens.

The light path is set to 100% to the binocular eye-pieces as the default setting at our facilities where the light path selection slider ① is pushed all the way in.

Pull the light path selection slider all the way out to send 100% to the top photo port for HDMI/digital imaging and documentation.

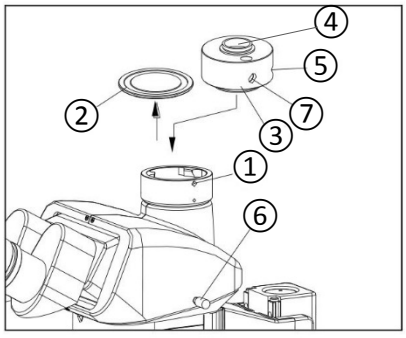


Fig 21

Mounting a Microscopy Camera *(Optional)* (Fig. 21)

Loosen the lock screw ① on the camera/photo port until it is flush with the inside of the portl remove the dust cap ②.

Remove the dust caps from both ends of the c-mount ③ and from your camera lens and attach the top opening ④ on the c-mount to the threaded mount on your camera.

Attach the bottom dovetail mount of the c-mount (with the mounted camera) onto the camera/photo port and tighten the lock screw ⑤.

Focus the image in the binocular view then pull the light path selection lever out ⑥. If the image is not clear, loosen the lock screw ⑤ and adjust the focusing screw ⑦ until the image is clear on the monitor, then tighten the lock screw ⑤.

OPERATION *(continued)*

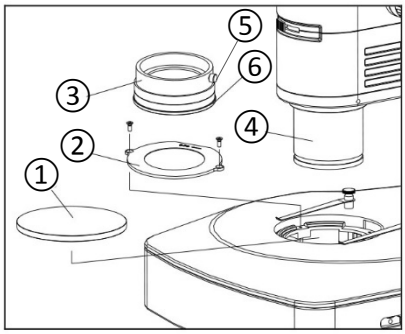


Fig. 22

Using the Polarizer/Analyzer (Fig. 22)

The simple polarizer includes the polarizer and analyzer.

Remove the stage insert plate ① (see Fig. 8, p. 3).

Insert the polarizer ② with the flat edge closest to the column (or aligned with the spring on the inside of the hole in the base), and screw it in place using the 3mm hex wrench. Replace the stage insert plate.

Slide the analyzer ③ onto the bottom outside diameter of the objective ④ and tighten the analyzer lock screw ⑤.

With the 360° rotating analyzer, you can change the orthogonal state of the polarized light by rotating the analyzer adjustment ring ⑥.

TROUBLESHOOTING

Under certain conditions, performance of this unit may be adversely affected by factors other than defects. If a problem occurs, 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 dealer for assistance.

OPTICAL

PROBLEM	CAUSE	SOLUTION
The illumination is on, but the field of view is dark.	The bulb is burnt out.	Replace it with a new one
	The brightness is set too low	Set it to the appropriate position
	The field diaphragm is not open enough or closed	Open the field diaphragm
	Too many filters are in the optical path	Reduce them to the minimum required number
The edge of the field of view is obscured or not evenly illuminated.	The nosepiece is not in the located position	Turn the nosepiece into the position where you can hear it engaged
	Dirt or dust has accumulated on the lens (objective or eyepieces)	Clean the lens
	Light path selection slider is not in the right position	Pull it into the right position
	The color filter, polarizer or analyzer is not inserted fully	Push it in all the way
Dirt or dust is visible in the field of view	Dirt/dust on the specimen	Replace with a clean specimen
	Dirt/dust on the eyepiece	Clean the eyepieces
The image is not clear	Cover glass on the specimen slide	Clean the specimen
	The specimen is not vertical to the objective	Adjust it
	The nosepiece is not in the correct position	Turn the nosepiece into the correct position
	The aperture diaphragm is not open correctly	Adjust it
	The light path selection slider is not in the correct position	Push it into the correct position
Visibility is poor ▪ Image is not sharp ▪ Contrast is poor ▪ Details are indistinct	The objective is not correctly engaged in the light path	Turn the nosepiece into the engaged position
	the aperture diaphragm is opened or stopped down too far in brightfield observation	adjust the aperture diaphragm properly
	The lens (condenser, objective, eyepieces) are dirty	Clean it thoroughly
One side of the image is dark, blurred or it moves while focusing	The objective is not in the center of the light path	Insure the nosepiece is in the “clicked” position
	The specimen is not correctly positioned on the stage	Reposition the specimen on the stage
The eyes tire easily; the right field of view doesn’t superimpose with the left	Interpupillary distance is incorrect	Adjust the interpupillary distance
	Diopter adjustment is incorrect	Adjust the diopter
	The eyepiece for the right eye is different from the left one	Use the same eyepieces

TROUBLESHOOTING *(continued)*

MECHANICAL PART

PROBLEM	CAUSE	SOLUTION
The coarse adjustment knob is too difficult to rotate	The tension adjustment ring is tightened too much	Loosen it
The image goes out of focus during observation or the stage drops by itself	The tension adjustment collar is too loose	Tighten it

ELECTRICAL SYSTEM

PROBLEM	CAUSE	SOLUTION
The lamp doesn't light	No power to the lamp	Check the power cord is connected correctly
	The lamp is not installed correctly	Install it correctly
	The lamp burns out	Replace the lamp
The light intensity is not enough	The light intensity control knob is not set properly	Adjust the light intensity control knob
	The wrong lamp is used	Replace the lamp with the correct one
The lamp keeps burning out	The wrong lamp is used	Replace the lamp with the correct one
The lamp flickers or the brightness is not stable	The lamp will burn out soon	Replace the lamp
	The power supply doesn't connect well	Connect the power supply correctly

MAINTENANCE

Please remember to ***never*** leave the microscope with any of the objectives or eyepieces removed and always protect the microscope with the dust cover when not in use.

SERVICE

UNITRON® microscopes are precision instruments which require periodic servicing to keep them performing properly and to compensate for normal wear. A regular schedule of preventative maintenance by qualified personnel is highly recommended. Your authorized UNITRON® distributor can arrange for this service. Should unexpected problems be experienced with your instrument, proceed as follows:

1. Contact the UNITRON® distributor from whom you purchased the microscope. Some problems can be resolved simply over the telephone.

2. If it is determined that the microscope should be returned to your UNITRON® distributor or to UNITRON® for warranty repair, pack the instrument in its original Styrofoam shipping carton. If you no longer have this carton, pack the microscope in a crush-resistant carton with a minimum of three inches of a shock absorbing material surrounding it to prevent in-transit damage. The microscope should be wrapped in a plastic bag to prevent Styrofoam dust from damaging the microscope. Always ship the microscope in an upright position; ***NEVER SHIP A MICROSCOPE ON ITS SIDE***. The microscope or component should be shipped prepaid and insured.

LIMITED MICROSCOPE WARRANTY

This microscope is warranted to be free from defects in material and workmanship for a period of five (5) years for mechanical and optical components and one (1) year for LED bulb and electrical components from the date of invoice to the original (end user) purchaser. This warranty does not cover damage caused in-transit, misuse, neglect, abuse or damage resulting from improper servicing or modification by other than UNITRON® approved service personnel. This warranty does not cover any routine maintenance work or any other work, which is reasonably expected to be performed by the purchaser. Normal wear is excluded from this warranty. No responsibility is assumed for unsatisfactory operating performance due to environmental conditions such as humidity, dust, corrosive chemicals, deposition of oil or other foreign matter, spillage or other conditions beyond the control of Unitron Ltd. This warranty expressly excludes any liability by UNITRON Ltd. for consequential loss or damage on any grounds, such as (but not limited to) the non-availability to the End User of the product(s) under warranty or the need to repair work processes. Should any defect in material, workmanship or electronic component occur under this warranty contact your UNITRON® distributor or UNITRON® at (631) 543-2000. This warranty is limited to the continental United States of America. All items returned for warranty repair must be sent freight prepaid and insured to Unitron Ltd., 73 Mall Drive, Commack, NY 11725 – USA. All warranty repairs will be returned freight prepaid to any destination within the continental United States of America. For all foreign warranty repairs, return freight charges are the responsibility of the individual/company who returned the merchandise for repair.