UNITRON®

Z10 SERIES

Z10 • Z8 • Z6

ZOOM STEREO MICROSCOPES

MANUAL

New York Microscope Company
Microscope Experts since 1979

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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. Keep the instrument out of direct sunlight, high temperature or humidity, and dusty environments.
3. 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.
4.  **LAMP REPLACEMENT -- CAUTION**: the glass envelope 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.
5. All electrical connectors (power cord) should be inserted into an electrical surge protector to prevent damage due to voltage fluctuations.
6.  **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.
7. 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. NOTE: Always plug the stereomicroscope power cord into a suitable grounded electrical outlet. A grounded 3-wire cord is provided.

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, lint free 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 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 servicing to maintain proper performance 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.

INTRODUCTION

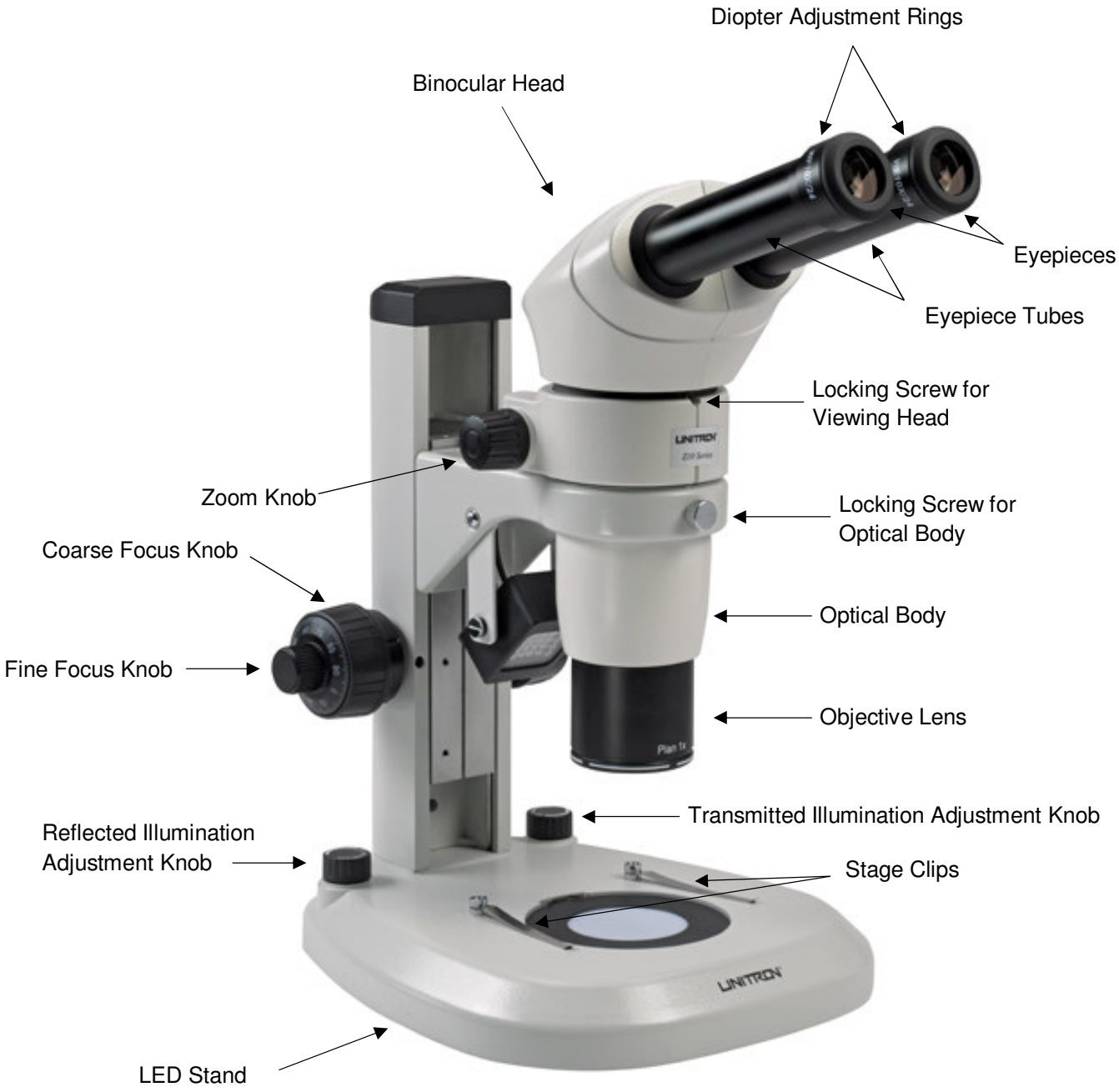
Congratulations on the purchase of your new UNITRON® microscope. UNITRON® microscopes are engineered and manufactured to the highest quality standards. Your microscope will last a lifetime if used and maintained properly. UNITRON® microscopes are carefully assembled, inspected and tested by our staff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

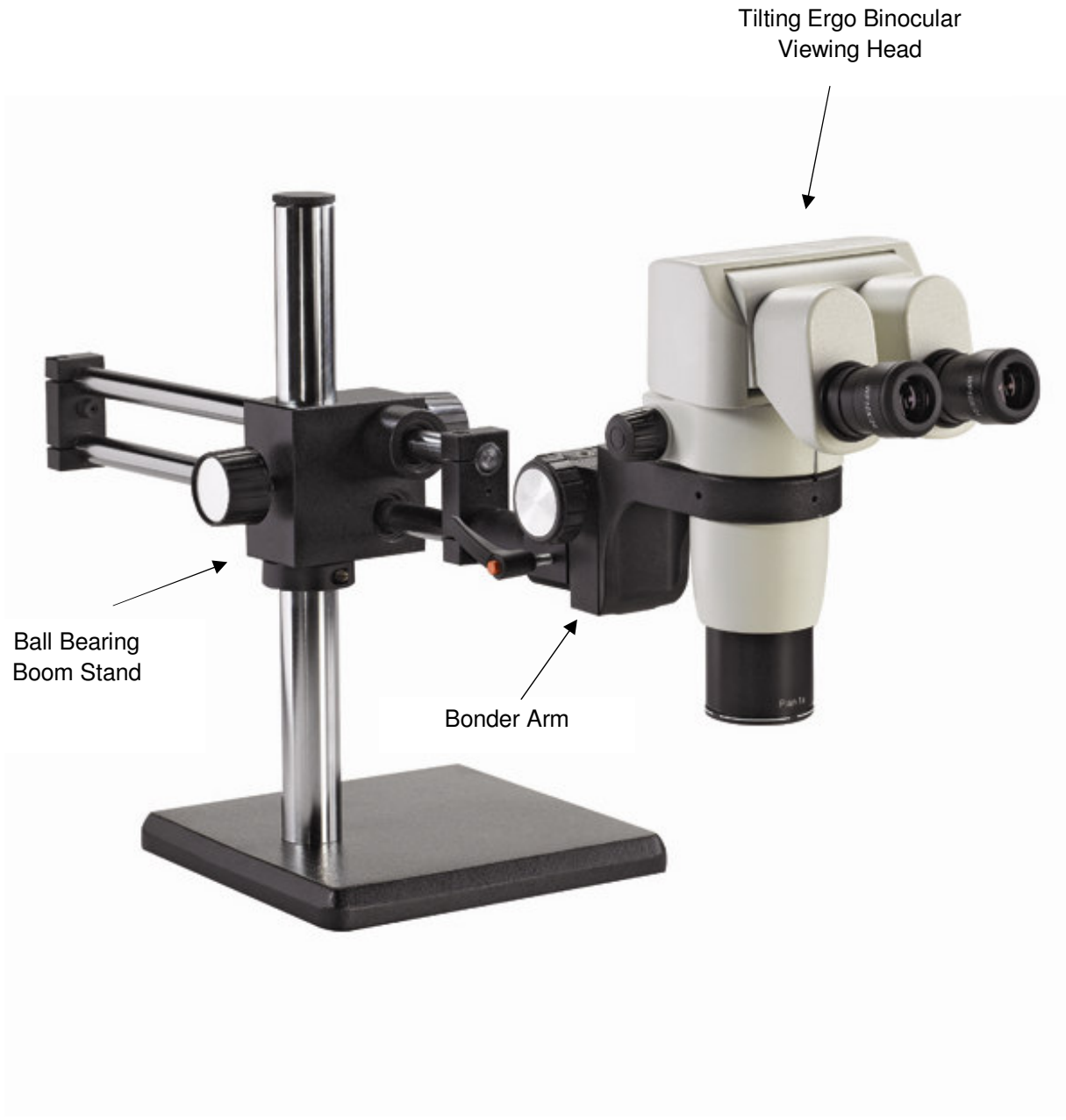
UNPACKING AND COMPONENTS

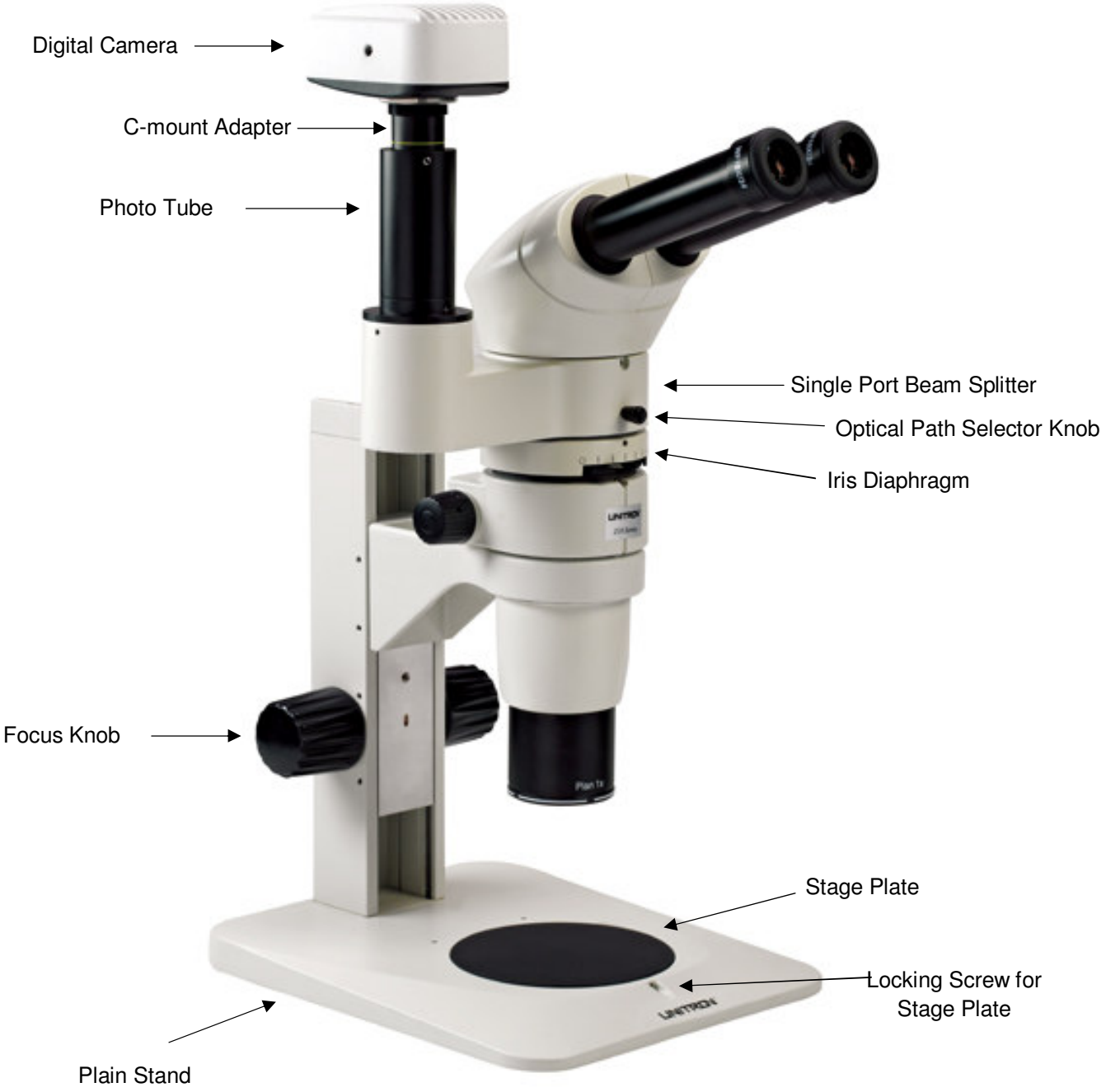
Your microscope arrived packed in a molded shipping carton. ***Do not discard the carton*:** the shipping carton should be retained for reshipment of your microscope if needed. Avoid placing the microscope in dusty surroundings or in high temperature or humid areas as mold and mildew can form. Carefully remove the microscope from the shipping carton and place the microscope on a flat, vibration-free surface.

COMPONENTS DIAGRAM

① Optical body—6.3:1, 8:1, 10:1
② 20 degree binocular viewing head
③ 0-35 degree ergonomic viewing head
④ Beam splitter/photo port
⑤ Iris diaphragm
⑥ Eyepieces
⑦ Auxiliary objectives
⑧ C-mount or photo tube


Diopter Adjustment Rings
Binocular Head
Eyepieces
Eyepiece Tubes
Locking Screw for Viewing Head
Zoom Knob
Locking Screw for Optical Body
Coarse Focus Knob
Optical Body
Fine Focus Knob
Objective Lens
Transmitted Illumination Adjustment Knob
Reflected Illumination Adjustment Knob
Stage Clips
LED Stand


Tilting Ergo Binocular
Viewing Head
Ball Bearing
Boom Stand
Bonder Arm


Digital Camera
C-mount Adapter
Photo Tube
Single Port Beam Splitter
Optical Path Selector Knob
Iris Diaphragm
Focus Knob
Stage Plate
Locking Screw for Stage Plate
Plain Stand

ASSEMBLY

The following photos show how to assemble the various modules in the order of assembly.

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

Installing the Focus Arm

For microscopes ordered with the Plain Focusing or LED stands the focus mount should be positioned at the higher position on the track. There are two positions on the dovetail track in which the focus mount can be installed. The positions are spaced 55mm apart. Should you need to lower the position of the focus mount for the future please follow the following steps:

1. Remove the viewing head, optical body and objective from the focus mount by loosening the locking screw on the focus mount.
2. Using the allen key that was supplied with your stand loosen the allen screw at the rear of the focus mount that connects the focus mount to the dovetail.
3. Align the screw hole opening on to the lower screw opening on the dovetail.
4. Align the two pins on the focus arm into the grooves on the dovetail slider.
5. Tighten the allen screw into place.
6. Reinsert the viewing head, optical body and objective into the focus mount and lock the assembly back into the focus mount by tightening the locking screw.

Mounting the Zoom Body

1. Carefully place the optical body into the focus mount and tighten the lock screw to secure the optical body in place.

2. Use caution not to over tighten the locking screw as this may cause damage to the instrument.

Mounting the Objective

1. Using care not to touch the lens surfaces, carefully thread the objective into the optical body.

Mounting the Viewing Head

1. Insert the viewing head into the optical body and secure it into place using a 2mm allen key to tighten the screw.

Installing the Eyepieces

1. Remove the dust caps from the eyepiece tubes.
2. Insert the eyepieces into the eyepiece tube. Be sure to install the eyepieces all the way into the tube.
3. Set the eyepiece diopter scale for each eyepiece to 0.

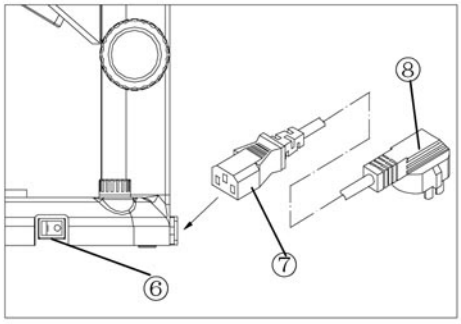


Fig. 4

Voltage Check

Confirm that the input voltage indicated on the rear label of the microscope corresponds to your line voltage. The use of a different input voltage than indicated will cause severe damage to your microscope.

Connecting the Power Cord (Fig. 4)

Turn the power switch ⑥ to the off position (O) before connecting the power cord ⑦.

Insert the power cord plug ⑦ into the power jack of the microscope; make sure the connection is snug.

Plug the power cord ⑧ into the power supply receptacle.

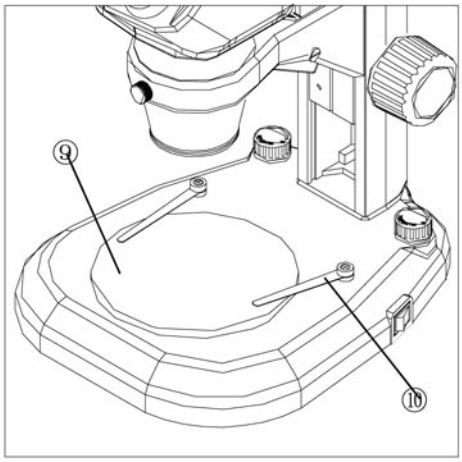


Fig. 5

Using the Glass Stage (Fig. 5)

Set the glass stage plate ⑨ on the center of the base, and secure the slide with the two clips ⑩.

ADJUSTMENT AND OPERATION

Adjusting Binocular Viewing Head

Fig. 6

Adjusting Interpupillary Distance (Fig. 6)

Different users have different interpupillary distances (this distance is between the centers of the pupils of each eye). When the operator of the microscope changes, it will be necessary to adjust the interpupillary distance.

While looking through the eyepieces, hold the left and right eyetubes of the viewing head and adjust the eyetubes by opening or closing them until the left and right fields of view coincide completely and you are able to see a complete circle.

Fig. 7

Adjusting Diopter Ring/Focusing (Fig. 7)

Set the diopter rings ② 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 ③ to the highest magnification, and turn the focusing knob ④ to focus the specimen.

Rotate the zoom knob ③ to the lowest magnification, looking only into the left eyepiece, adjust the diopter ring on left eyepiece to focus the specimen. Then repeat this procedure for the right eyepiece.

NOTE: The working distance (the distance between the microscope objective to the top of the specimen) of the microscope is 78mm (with the 1x Plan objective).

Focus Adjustment

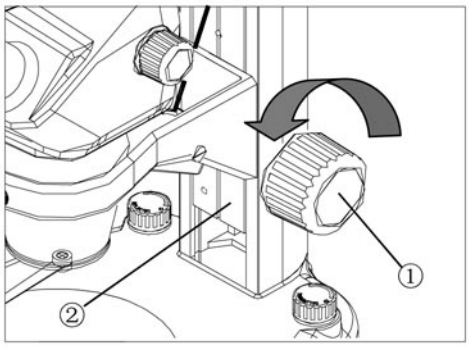


Fig. 8

Adjusting the Rotation Tension of the Focus Adjustment Knob (Fig. 8, Fig. 9)

To adjust tension, hold both left and right focus adjustment knobs ① with both hands, hold the left knob (to prevent it from turning), and rotate the right knob clockwise to increase (tighten) or counterclockwise to decrease (loosen) the focus knob tension.

After tension adjustment has been completed, always rotate both adjustment knobs in the same direction.

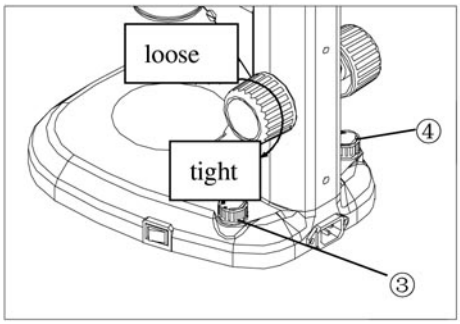


Fig. 9

Changing the Magnification

The zooming knobs located on both sides of the zooming body will change the magnification of the specimen image.

Total Magnification = Magnification of zoom body x objective x magnification of eyepiece (i.e., 0.8 x 1.0 x 10=8x)

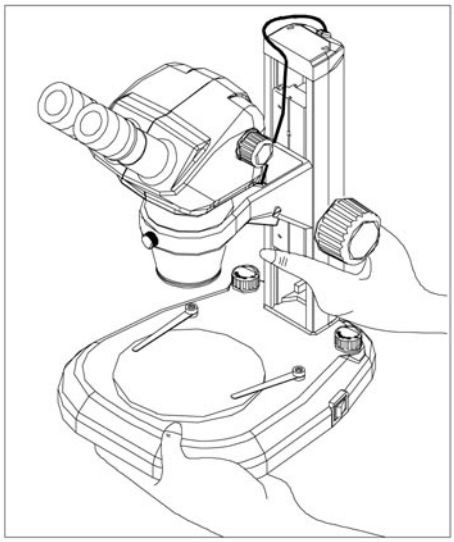


Fig. 10

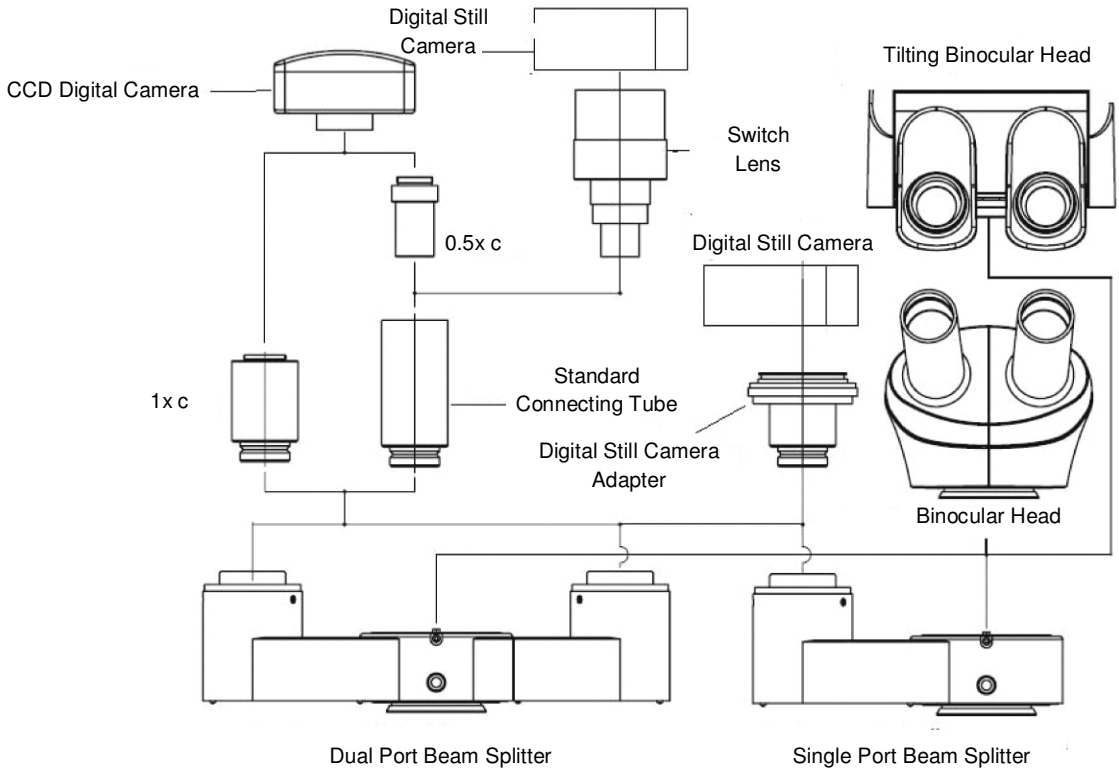
Moving the Microscope (Fig. 10)

Before moving the microscope, be sure to remove any slide/samples. When moving the microscope, hold the stand and base as shown in Fig. 10 to keep it level.

Installing the Beam Splitter

Place the beam splitter onto the top of the optical body by matching the groove of the of the beam splitter's bottom and the securing screw of the optical body. Tighten the screw to secure the optical body and the beam splitter. Install the viewing head on top of the beam splitter and secure it with allen screw.

Assembling the Beam Splitter, Viewing Head & Cameras



Installing the Iris Diaphragm

1. Remove the viewing head by loosening the allen screw that secures the head to the optical body.

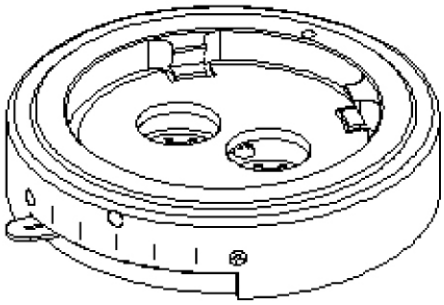
2. Use caution to hold the viewing head as you loosen the screw so it does not fall.

3. Install the iris diaphragm on top of the optical body, tighten the allen screw to secure it into place.

4. Mount the eyepiece tube on top of the iris diaphragm and tighten the allen screw to secure it into place.

Operating the Iris Diaphragm

The iris diaphragm is used to enhance the contrast of the image and provide additional depth of field for photography. To open the iris diaphragm move the adjusting lever to the left, to close the iris move the adjusting lever to the right. Do not close the iris diaphragm too tight or it will reduce the resolution.



SPECIFICATIONS

Z6 Series 6.3:1 Parallel Zoom Body

Objective Lens	Working Distance (mm)	EYEPIECE					
		WF 10X (Ø24mm)		WF 15X(Ø16mm)		WF 20X(Ø12mm)	
		Total Magnification	Visual Field (mm)	Total Magnification	Visual Field (mm)	Total Magnification	Visual Field (mm)
0.3x	280	2.4X-15X	100-16	3.6X-22.5X	66.7-10.67	4.8X-30X	50-8
0.5X	126	4X-25X	60-9.6	6X-37.5X	40-6.4	8X-50X	30-4.8
1X	78	8X-50X	30-4.8	12X-75X	20-3.2	16X-100X	15-2.4
2X	32.5	16X-100X	15-2.4	24X-150X	10-1.6	32X-200X	7.5-1.2

Z8 Series 8:1 Parallel Zoom Body

Objective Lens	Working Distance (mm)	EYEPIECE					
		WF 10X (Ø24mm)		WF 15X(Ø16mm)		WF 20X(Ø12mm)	
		Total Magnification	Visual Field (mm)	Total Magnification	Visual Field (mm)	Total Magnification	Visual Field (mm)
0.3x	280	2.4X-19.5X	100-12.3	3.6X-29.3X	66.7-8.2	4.8X-39X	50-6.15
0.5X	126	4X-32.5X	60-7.4	6X-52X	40-4.9	8X-65X	30-3.7
1X	78	8X-65X	30-3.7	12X-97.5X	20-2.5	16X-130X	15-1.85
2X	32.5	16X-130X	15-1.85	24X-195X	10-1.23	32X-260X	7.5-0.9

Z10 Series 10:1 Parallel Zoom Body

Objective Lens	Working Distance (mm)	EYEPIECE					
		WF 10X (Ø24mm)		WF 15X(Ø16mm)		WF 20X(Ø12mm)	
		Total Magnification	Visual Field (mm)	Total Magnification	Visual Field (mm)	Total Magnification	Visual Field (mm)
0.3x	280	2.4X-24X	100-10	3.6X-36X	66.7-6.67	4.8X-48X	50-5
0.5X	126	4X-40X	60-6	6X-60X	40-4	8X-80X	30-3
1X	78	8X-80X	30-3	12X-120X	20-2	16X-160X	15-1.5
2X	32.5	16X-160X	15-1.5	24X-240X	10-1	32X-320X	7.5-0.75

Resolution and N.A.

Magnification	Resolution (Lp/mm)	Numerical Aperture (N.A.)
8X	289	0.08
6X	256	0.078
4X	228	0.064
3X	204	
2X	128	0.032
1X	64	0.02
0.8X	57	0.0224

ISO 9001
Certification
Design and production adheres to ISO9001 international quality standard.

CE

ISO 14001
Certification
Design and production meets the requirements of international standard ISO 14001 for environmental management.

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.

Trouble	Cause	Remedy
Double images	Interpupillary distance is not correct	Readjust it – page 12
	Diopter adjustment is not correct	Readjust it – page 12
Dirt appears in the view field	Dirt on the specimen	Clean specimen
	Dirt on the surfaces of eyepieces	Clean eyepieces
Image is not clear	Dirt on the surface of objectives	Clear objectives
Image is not clear while focusing change	Diopter adjustment is not correct	Readjust diopter – page 12
	Focusing is not correct	Readjust it – page 12
The focusing knob is not smooth	The focusing knob is too tight	Loosen it to a suitable position – page 13
The image is obscure because of the head slipping down during observation	The focusing knob is too loosen	Tighten it to a suitable position – page 13

MAINTENANCE

Please remember to ***never*** leave the microscope with 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 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 then 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.