

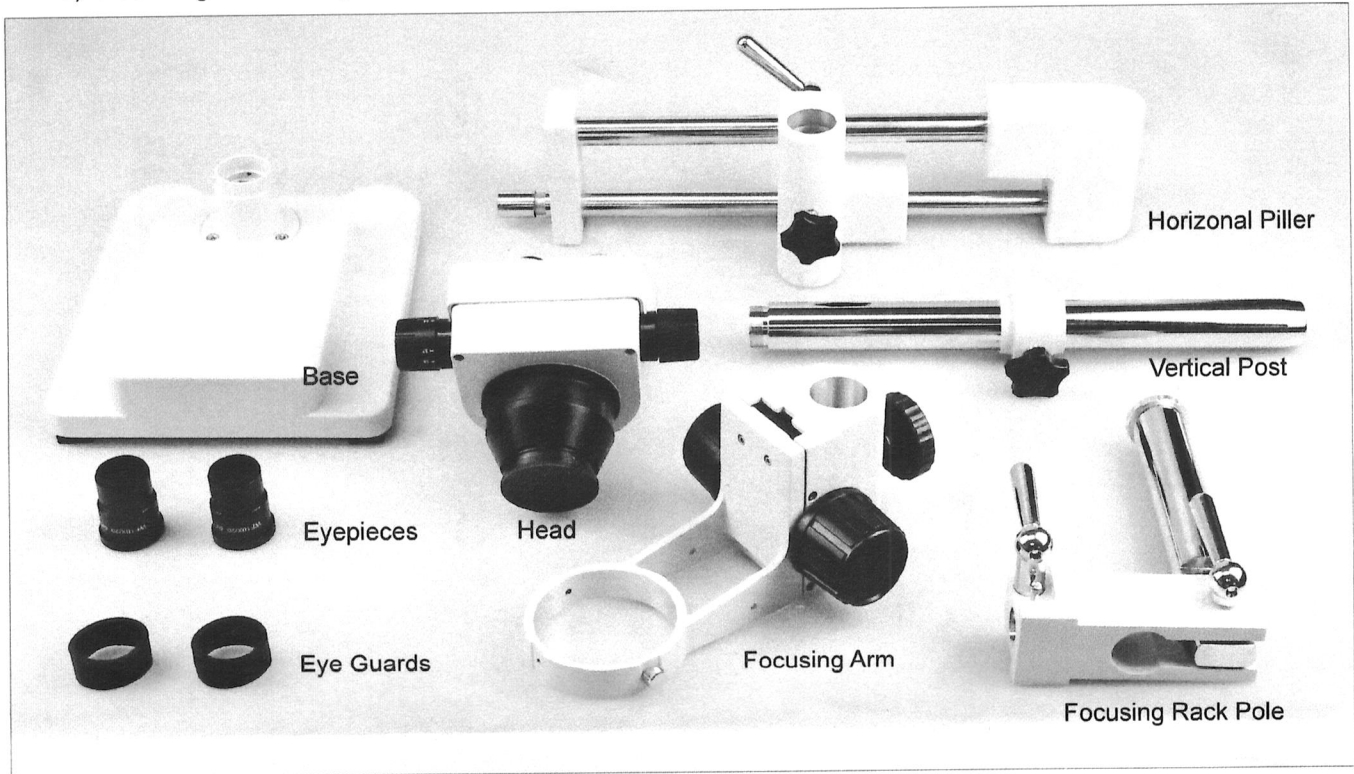
Double Arm Boom Stand

Instruction Manual

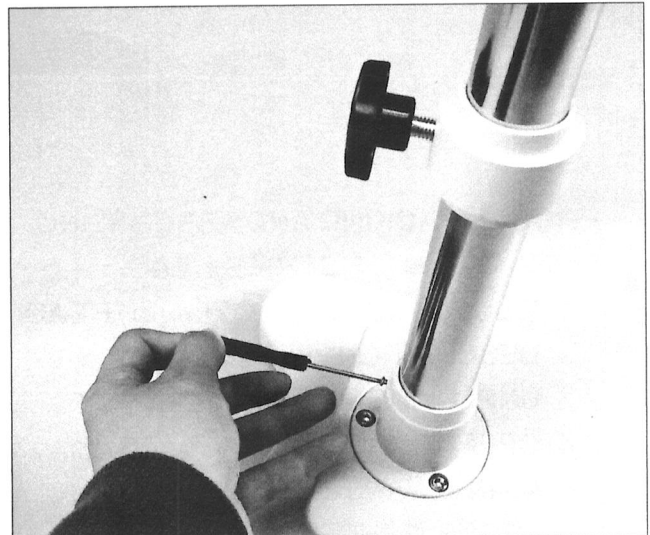
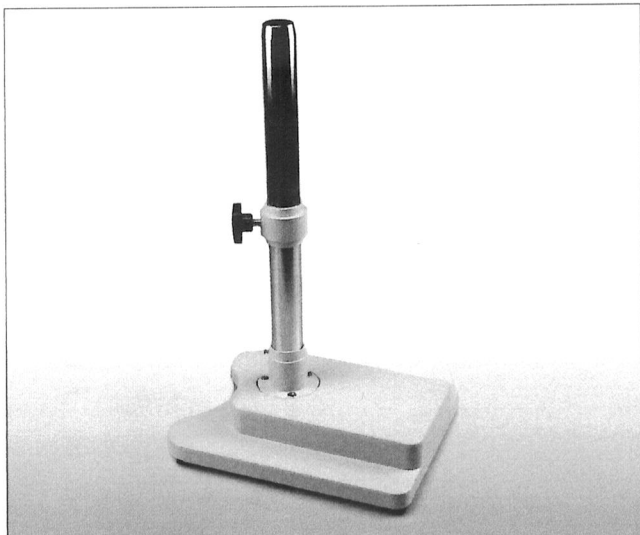
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1. Carefully remove all parts from box and check for all package contents as listed and shown below.

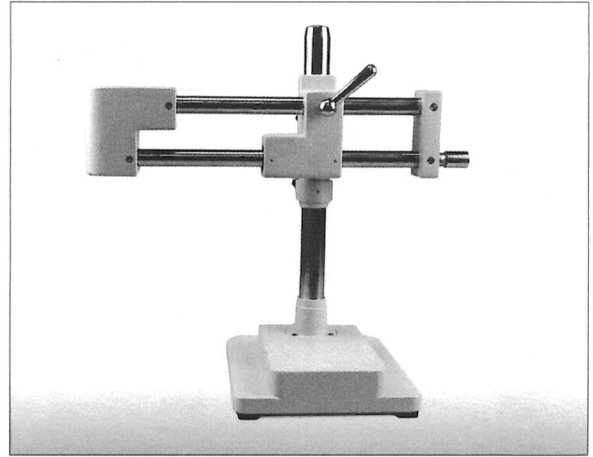
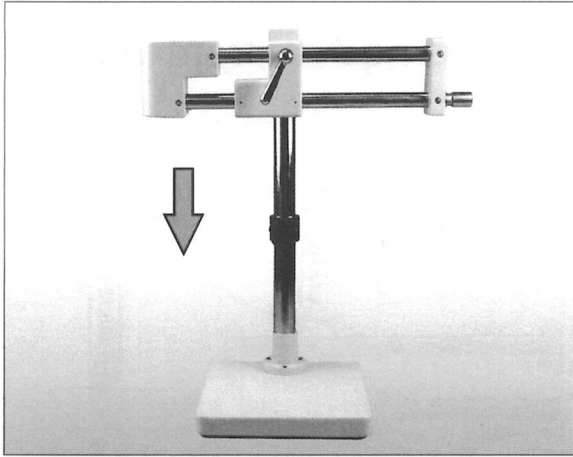
- | | | | |
|-----------------|------------------|----------------------|-----------------------|
| 1) Base | 2) Vertical Post | 3) Horizontal Piller | 4) Focusing Rack Pole |
| 5) Focusing Arm | 6) Head | 7) Eyepieces | 8) Eye Guards |



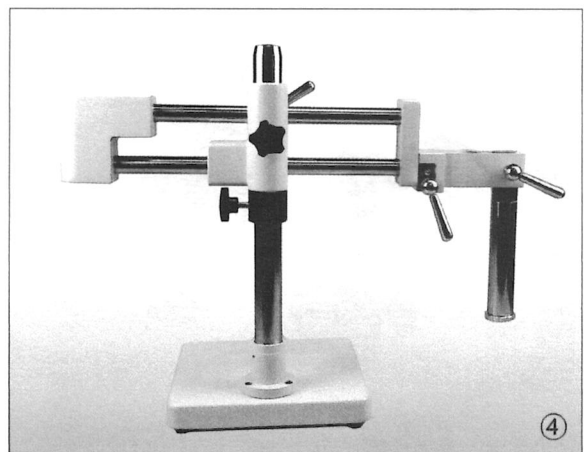
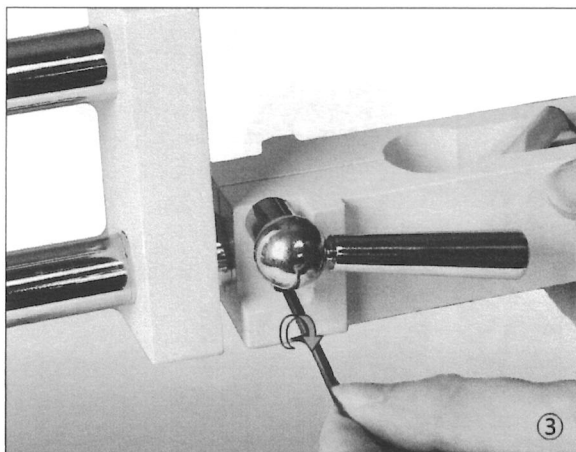
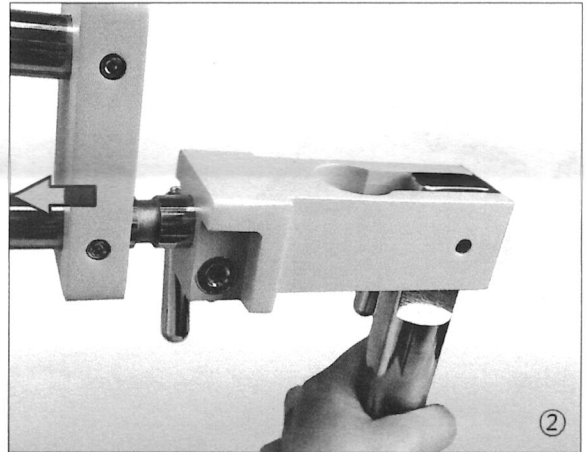
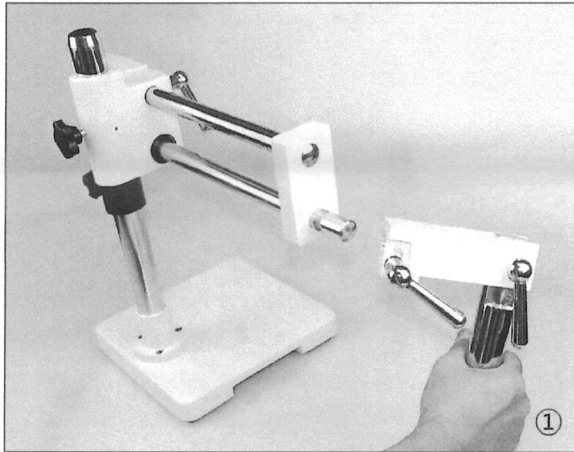
2. Insert the vertical post onto base, tighten and secure the screw



3. Installation of the horizontal pillar

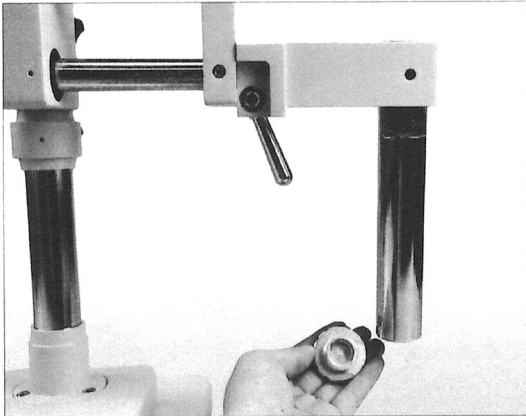


4. Installation of the focusing rack pole

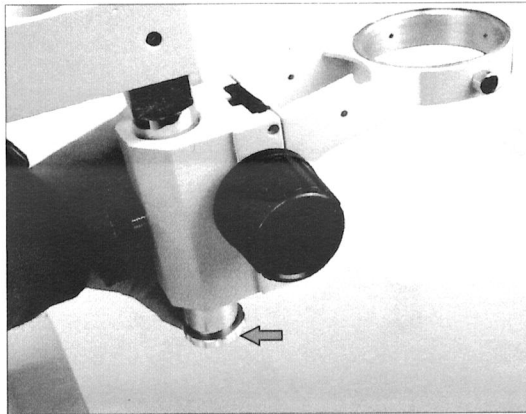


5-1. Focusing arm installation (2-Way)

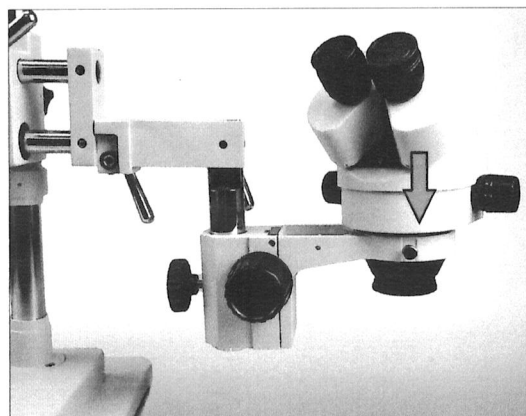
Focusing Arm from Bottom



A. Keep the rod head down, remove the bottom cap from the rod.

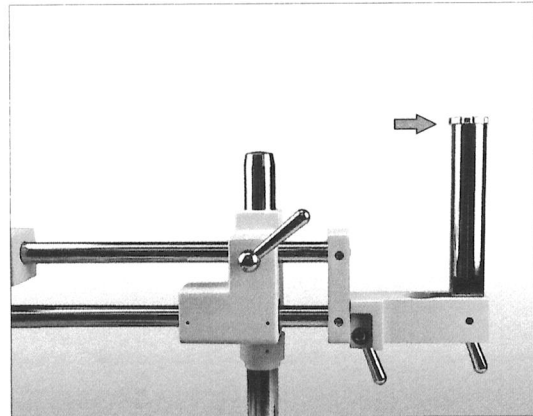


B. Insert the focusing arm into the rod from bottom and re-cap the rod.

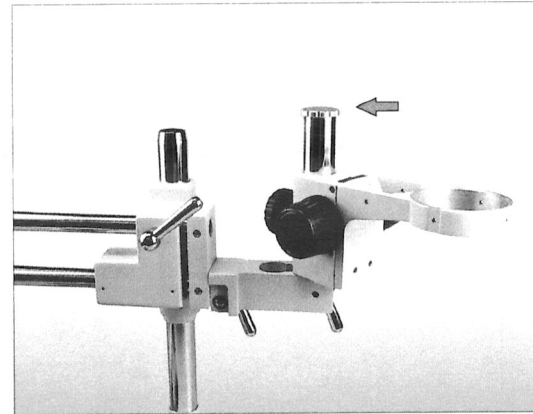


C. Place the head into focusing arm.

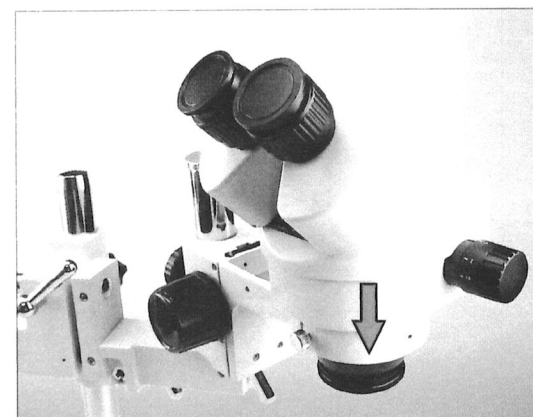
Focusing Arm from Top



A. Keep the rod head up, remove the top cap from the rod.

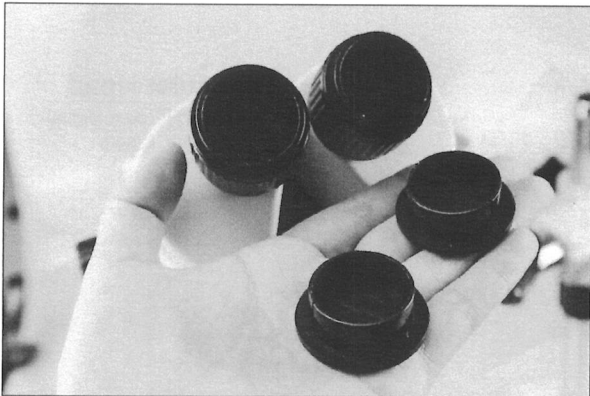


B. Insert the focusing arm into the rod from top and re-cap the rod.

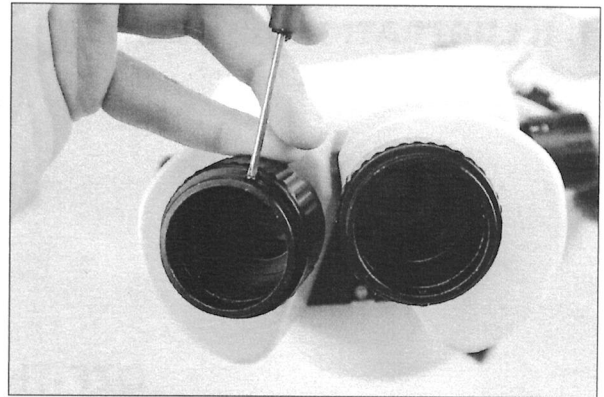


C. Place the head into focusing arm.

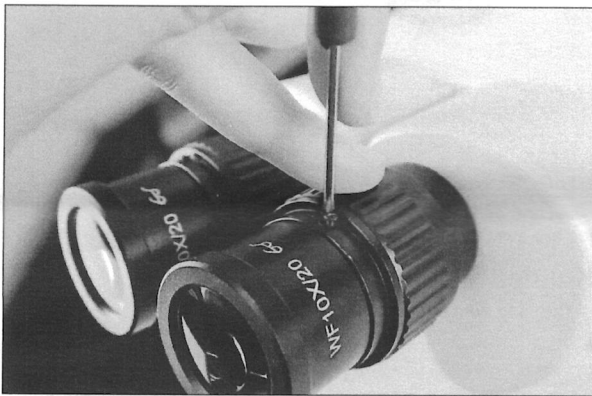
5. Eyepieces and accessories installation



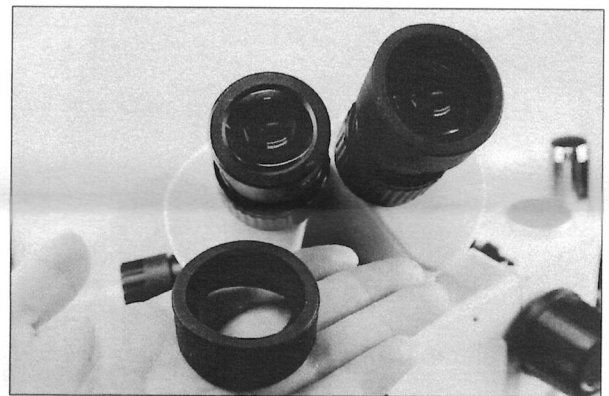
A. Remove caps



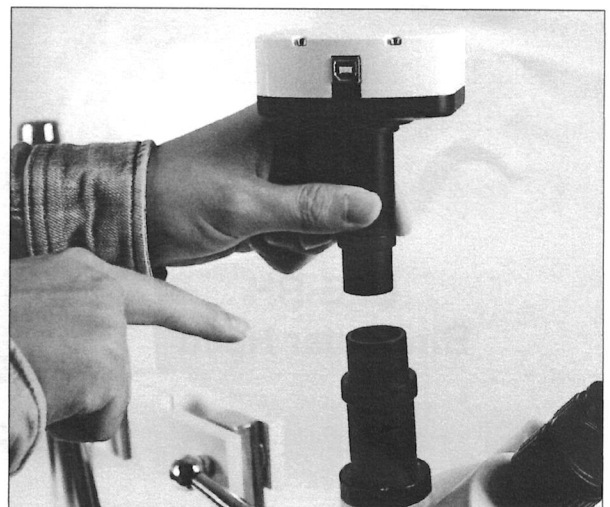
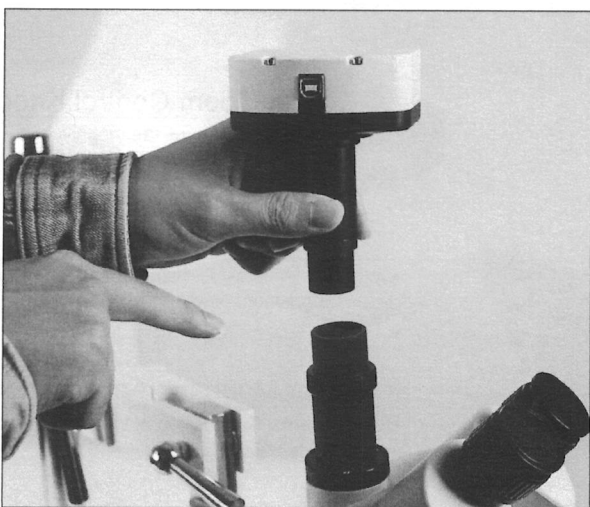
B. Loosen screws prepare for eyepieces



C. Insert eyepieces and secure screws

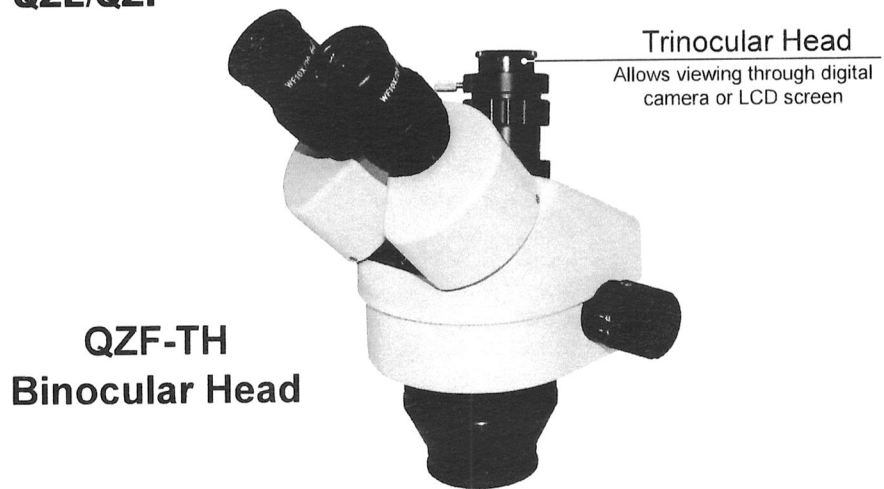


D. Cover eyepieces with eye guards



QZE / QZF SERIES HEAD

1. ILLUSTRATION OF QZE/QZF



2. DESCRIPTION

The stereo microscope offers ergonomic features such as synchronized bilateral inter-pupillary distance adjustments. Designed to outfit with a variety of lens accessories to increase or reduce magnification. Smooth in operation, it has a calibrated zoom range operable on both sides of the head. The trinocular model with digital camera is excellent for photo microscopy or LCD screen. This series is an ideal microscope for studying living organisms, dissecting small specimens, studying crystalline or rock structure, plus electronic and small part inspections.

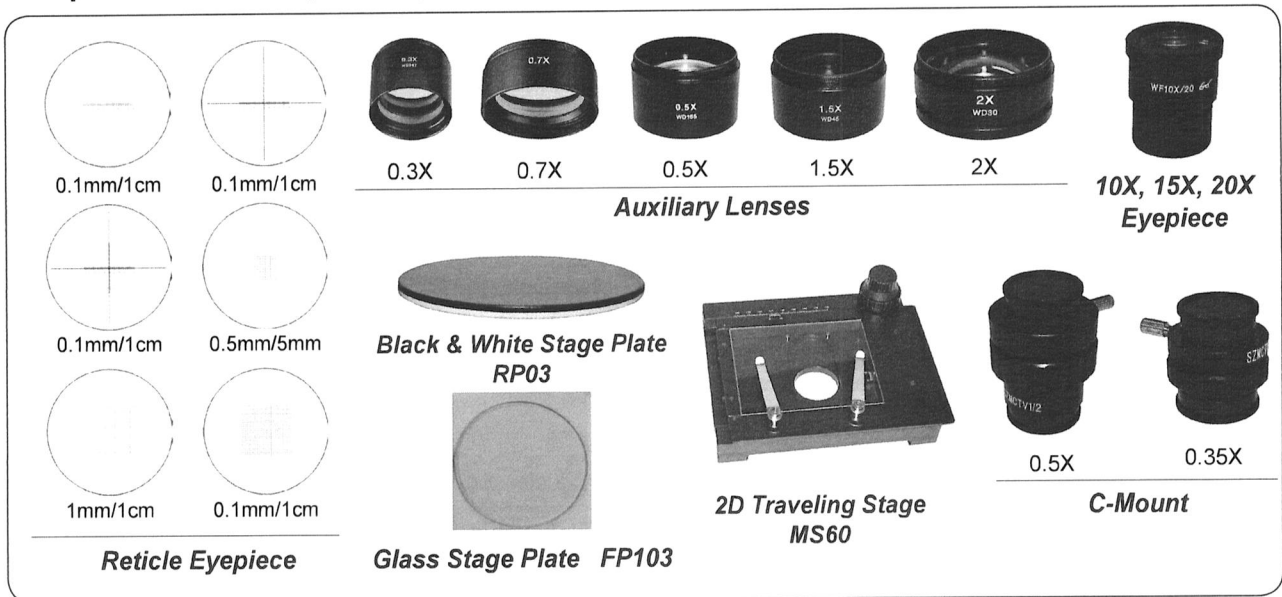
2.1 Specifications

Magnification	Standard magnification: 7.0X~45X. Magnification range can be 3.5X~180X with auxiliary objectives and optional eyepieces
Viewing Head	Binocular or trinocular head (20%/80% splitting ratio), 45° inclined and 360° rotatable.
	Interpupillary distance adjustable from 54mm-76mm. Synchronized bilateral inter-pupillary distance adjustment.
	Two diopter adjustment of +/-6 on both ocular tubes
Eyepiece	10X wide-field (Field of view number, FN20), high eyepoint
	Paired 10X/20mm, optional eyepieces WF15X/15mm, WF20X/10mm, and reticle eyepieces WF10X/20mm
	The eyepieces can be locked on with setscrews to prevent students from removing them.
Zooming Body	Standard objective zooming magnification: 0.7X ~ 4.5X, Zoom ratio: 1:6.4, parfocal, working distance 100mm
	Auxiliary objectives: 0.5X/165mm(working distance), 1.5X/45mm, 2X/30mm available (not included)
	Dual, graduate, bilateral zoom control knobs
	Objective lens protective glass available (not included)
Focusing Arm	Heavy duty rack and pinion focusing with slip clutch
	Two focusing knobs with tension adjustment, 100mm focus distance range
Imaging	Trinocular head available 20/80 light splitting ratio, with special interface, be able to connect to digital camera, imitate CCD, digital CCD, VGA
	0.5 focus adjustable C-mount, 0.35 focus adjustable C-mount

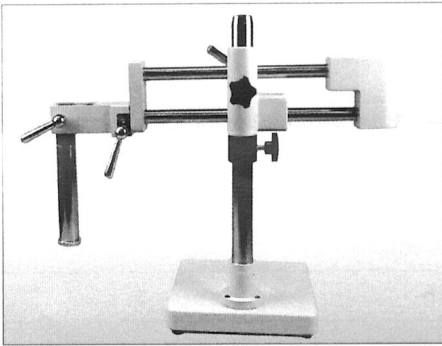
2.2 Technical Data

Eyepiece	Without Auxiliary Objectives		With Additional Auxiliary Objectives					
			0.5X		1.5X		2X	
	Total Magnification	Field Diameter	Total Magnification	Field Diameter	Total Magnification	Field Diameter	Total Magnification	Field Diameter
10X/20mm	7.0x-45.0x	28.6-4.4mm	3.5x-22.5x	57.1-8.9mm	10.5x-67.5x	19-3mm	14x-90x	14.3-2.2mm
15X/15mm	10.5x-67.5x	21.1-3.3mm	5.25x-33.75x	42.8-6.7mm	15.75x-101.25x	14.3-2.2mm	21x-135x	10.7-1.7mm
20X/10mm	14.0x-90.0x	14.3-2.2mm	7.0x-45.0x	28.6-4.4mm	21.0x-135.0x	9.5-1.5mm	28x-180x	7.1-1.1mm

2.3 Optional Microscope Components



2.4 BALL BEARING BOOM STAND (VMI-IS8N)



- 1) Ball-bearings support the dual shaft horizontal arm, which allows the stand to glide back and forth effortlessly; enhancing freedom of movement
- 2) Microscope can be positioned to various directions as needed
- 3) Recommended choice for users seeking precise and stable movements
- 4) Perfect for observation of large specimens. Rotating, swivelling, and tilting functionalities are sure to meet your specific viewing requirements

Specifications:

Vertical pole mounting diameter	Φ32mm	Focusing pole mounting diameter	Φ32mm
Length of vertical pole	384mm	Focusing arm:Holder ring	Φ76mm
Horizontal movement	234mm	Collar size	Φ32mm
Base: Square	260×210×50mm		

3 UNPACKING AND PREPARATION

3.1 Unpacking

When unpacking the equipment, verify that all parts specified on the delivery note are present. Retain the original packaging for storage of the microscope in longer periods of non-use or for return to the manufacturer. Always keep the microscope in a clean, dry, and dust free environment.

3.2 Handling

Always use two hands to carry your microscope. Always ensure that all microscope components (eyepieces, cameras, adaptors, stage plates etc.) are secured tightly or otherwise removed before transporting. NEVER CARRY THE MICROSCOPE UPSIDE DOWN. THIS WILL PREVENT THE UNIT FROM DROPPING or the ocular components from falling out of alignment.

3.3 Assembly and preparation

- Set up the microscope on a stable worktable with a solid and smooth tabletop. Do not touch optical surfaces. This may affect image quality.
- Mount the incident LED light on the arm using the screws for mounting LED illuminator, plug the cord of top LED light to the top of the Pillar.
- Sit the zooming body on the stand arm. Fix the zooming body in the desired position with the clamping screw.
- Unscrew and remove the cover under the zooming objectives.
- Screw optional auxiliary objective tight under the zooming body in a counterclockwise direction.
- Insert eyepieces into the eyepiece tubes. The eyepieces can be locked on with setscrews to prevent students from removing them.

3.4 Storage

- Ensure light intensity switch is turned down to the lowest setting and switch on the base is turned off.
- Store your microscope with a protective dust cover in a low humidity environment.
- Keep all of your eyepieces, objectives and other accessories in place during storage.

4 OPERATING PROCEDURE

4.1 Operating procedure for binocular microscope (Trinocular microscope includes 4.1-4.2)

1) Place the sample

Place your desired stage plate above the transmitted LED light on the base. The type of the plate to be used, i.e., either transparent glass plate, black side or white side of the black/white plate, is based on your specific requirement. Place your specimen/subject onto the stage plate, using the stage clips if necessary to hold it in place.

If the specimen is opaque, use the black/white stage plate. Your selection depends on which side (black or white) gives you the best contrast conditions with the specimen. For transparent specimens and semi-transparent specimen, the glass plate is suitable.

2) Turn on the light

- Connect the power cord plug to the AC receptacle, and then plug the power cord into the grounded, 3-conductor power outlet.
- Turn on the main power switch of the microscope illumination.
- The intensity of incident (up) light and transmitted (bottom) light can be controlled separately. Adjust these lights and give the required illumination based on the nature of your specimen.

The incident light is used for opaque specimens, while the transmitted light effectively illuminates the internal structure of transparent specimens. Translucent specimens may be more accurately studied if both illuminators are operated simultaneously. Experiment with different lighting to obtain the best results for specific needs.

3) Adjust the interpupillary distance

- Insert both eyepieces into the eyepiece tubes. Push eyepieces into the eyepiece tubes as far as it will go. (If needed, one of the eyepieces could be an optional reticle eyepiece.)
- Look down the eyepieces, grasp and rotate the eyepiece prism housings closer or further with both hands to adjust the interpupillary distance so that the fields of view for each eye are merged into one. The adjustment of the interpupillary distance is correct when you see only one round image while looking down the two eyepieces. The interpupillary distance can be adjusted from 54-76mm.
- Turn the diopter rings on both ocular tubes to set them at the 0 position (match the 0 line with the index white dot on eyepiece collar). (This is to prepare for the following procedure.)

Stereo microscopes, when adjusted properly, allow the observer to see the object image in three dimensions with the perception of the height and depth of the specimen. This is a great advantage in material examination and quality control techniques.

To achieve these desirable height/depth effects, the image coming from the binocular eyepieces must be "fused" into a single image by the observer. This requires careful setting of the binocular body. The procedure below describes this focusing procedure.

4) Set working distance and focus

Select the minimum magnification. To do this, turn the zoom control knobs on both sides of viewing head. The number on the right zoom control knob shows the magnification power of the objective. Turn it counterclockwise to minimum 0.7x.

Selecting the minimum magnification makes it easier to find the desired object segment or centre of a specimen slide in a large field of vision.

- Look into the eyepieces, focus (move the zooming body higher or lower) by turning the focus knob.

The distance between the focus plane and the bottom surface of the zooming body is called 'the working distance'. Since standard working distance without an auxiliary lens is 100mm, the focusing will be easier if you put the zooming body at the position where its bottom surface is 100mm apart from the sample surface. Refer to the table on section 2.2 regarding working distance when auxiliary objectives are attached.

- If the focusing drive is too stiff to move or so loose that the focusing arm slips down unassisted, adjust the torque of the focusing drive to suit the weight of the zooming body. To do this, hold one focus knob in each hand and turn in opposite directions until the desired tension is reached.
- Set highest magnification by turning the zoom control knob clockwise to the end, i.e., 4.5x.
- Focus by turning the focus knob to optimize sharpness.

Selecting the maximum magnification optimizes the sharpness and brings the specimen into the best possible focus.

- When you have the zooming body at the required height, i.e., optimal focusing, tighten the torque of the focus knobs until the body is held firmly in place.

5) Adjust the diopter

Both eyepieces are suitable for spectacle wearers. The ocular tube contains knurled diopter rings for the compensation of defective vision.

- Set lowest magnification to 0.7x by turning the zoom control knob.
- Do not look into the eyepiece. Turn the knurled diopter ring counterclockwise until it stops.
- With your left eye, look through the left eyepiece and turn the diopter ring slowly clockwise, until the object can be seen clearly i.e., bring the specimen into focus.
- Set the diopter for the other eye in the same way.
- Set highest magnification 4.5x.
- Look into both eyepieces. Gently refocus if necessary by turning the focus knobs.
- Test parfocality.
- Turn the zoom control knob. The sharpness must remain constant over the entire zoom range, i.e., parfocal. Otherwise, please repeat the procedure above.

If you adjust the diopter as described above, the focus will remain constant, or parfocal, for the entire magnification range. In other words, you don't have to refocus when you change magnification, unless you use a different auxiliary lens or examine an object segment with a higher or lower position. In any circumstances, you don't need to adjust the diopter any more, only adjusting the focus knob would be enough.

If you are using a reticle, the diopter adjustment and parfocality setting procedure are slightly different. (please see the paragraph below)

The procedure of adjusting the diopter on a reticle eyepiece is similar with the procedure above except:

- Insert one reticle eyepiece into one of the eyepiece tubes. Only one reticle eyepiece is needed. Make sure the magnification power and the field of view number of the two eyepieces are consistent. If your eyes differ in strength of sight, use the reticle eyepiece on the side with your better eye. If the eyepiece itself is not diopter adjustable, and you cannot see the diopter clearly even with your better eye, use spectacles to correct your vision. Make sure the magnification power of both eyepieces are the same.
- Other diopter adjustment procedure is the same without a reticle.

6) Change the zooming magnification

Turn the left and right zoom control knobs of the zooming body. This will change the magnification of the sample image. Choose the desired magnification. Attach the auxiliary objective to the bottom of the zooming body when needed. The working distance may change when changing auxiliary objective. Due to the parfocal character of the microscope, if no auxiliary objective is changed, the working distance should be the same, i.e., no need to refocus.

Total magnification=eyepiece magnification×zooming magnification×auxiliary objective magnification

Please refer to section 2.2 technical data table for the total magnification and working distance for different auxiliary objectives.

4.2 Please contact your dealer for the latest detailed camera and photograph options

5. MAINTENANCE AND CARE

The QZE/QZF microscope requires only minimum maintenance and has features designed to prevent many of the accidents common to most student microscopes. These features include locked-in stage clips and eyepieces, preventing easy loss and damage. We have also eliminated a number of mechanical problems by locking the Rack & Pinion Gearing Mechanism together with a patented slip clutch system. If forced, the focus knob controlling the movement of the gears will turn freely, adding a slip clutch system to the focus knobs, eliminating expensive gear damage.

5.1 Proper handling

Always use two hands to carry your microscope: one on the arm, and one supporting the base. Never carry the scope upside down. This will prevent the unit from dropping or the ocular components from falling out.

5.2 Cleaning of the optical surfaces

Never take objectives or eyepieces apart. They should be cleaned while attached to the instrument as they are not easily removed. Avoid touching any optical parts with your fingers. Oil from your fingers can distort the image and damage the optics. To clean lens surfaces, remove dust using a soft brush or compressed air can. Use a cotton-tip applicator and a small amount of xylene and clean the surface using a circular motion. Clean only the front lens element of the objective and the top lens of the eyepiece. Wipe again with a clean cotton-tip and, finally, blow or brush off the lens surfaces. The illuminator lens surfaces may be cleaned in the same manner, but better results may be obtained by wiping with a soft lint free cloth.

5.3 Cleaning and lubricating of mechanical parts

This type of maintenance should be done by an authorized technician and will help insure many years of trouble free use of your microscope. It is in your best interest to have your microscope serviced at least every two years.

5.4 Finish cleaning the microscope

The finish of the microscope is hard epoxy and is acid resistant. It is extremely durable and stands up well under rough use. Use a soft cotton cloth to wipe clean. When cleaning the frame, exercise care not to smear the optics.

6. TROUBLESHOOTING GUIDE

Problem	Remedy
Darkness when looking down the eyepieces	Make sure the cover under the zooming body is removed.
	For trinocular head, the light-distribution pin is pushed all the way in, otherwise, there is no light in the left ocular tube.
	Adjust the interpupillary distance.
Field of view is in shadow	Adjust interpupillary distance and make sure it is correct.
	Adjust exit pupil position.
The image does not stay in focus	Insert eyepieces in the eyepiece tube correctly.
	Adjust the diopter exactly as described.
Reticle cannot be seen	Your eyesight might not be far enough, try to wear a spectacles to correct your vision before observation
The focusing arm slides down; or focus is lost during observation.	Increase the torque of the tension by turning the focus knobs to opposite directions.
Focus knob is difficult to turn	Loose the torque of the focus knob.
Bulb does not light or problems with electrically powered equipment	Main power switch is on.
	Power cable is correctly connected.
	All connector cables are correctly connected.
	Cord of incident light is plugged all the way in.
	Adjust the light intensity switch to ensure that it is not turned all the way down.
	Mount designated bulb.
	Replace bulb.
	The fuse works.
Field of view of one eye does not match that of the other	Adjust interpupillary distance.
	Adjust diopter.
	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.
Photographs are blurred	Focus precisely.
	Inserted eyepieces all the way in.
	Focus on reticle and adjust diopter exactly according to the instructions.