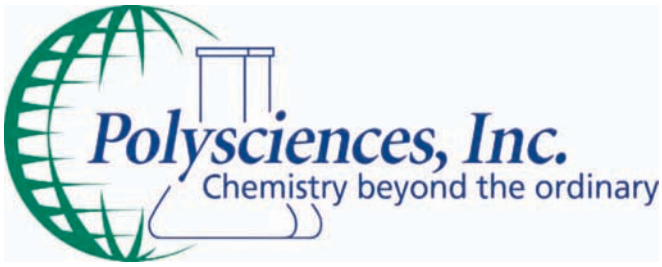


3032 MICROSCOPE SERIES INSTRUCTIONS

US Headquarters

400 Valley Road
Warrington, PA 18976

(800) 523-2575 / (215) 343-6484
(800) 343-3291 / (215) 343-0214 fax
info@polysciences.com
www.polysciences.com

European Headquarters

Handelsstrasse 3
D-69214 Eppelheim
Germany

(49) 6221-765767
(49) 6221-764620 fax
info@polysciences.de

Asia-Pacific Headquarters

Polysciences Asia Pacific, Inc.
2F-1, 207 DunHua N. Rd.
Taipei, Taiwan 10595

(886) 2 8712 0600
(886) 2 8712 2677 fax
info@polysciences.tw

Our catalog lists over 3,000 unique and specialty products that are used by histology professionals, lab technicians, pathologists, chemists and scientists worldwide. Visit **www.polysciences.com** to learn more about our product lines.

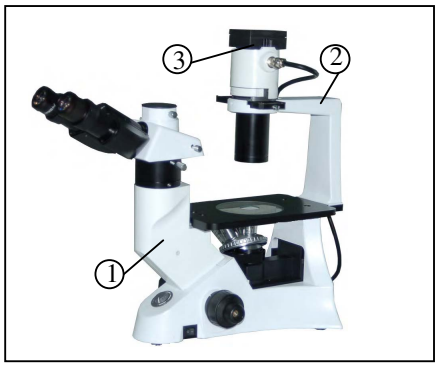


Figure 1

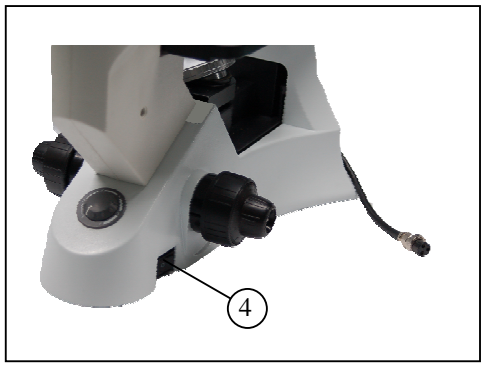


Figure 2

SAFETY NOTES

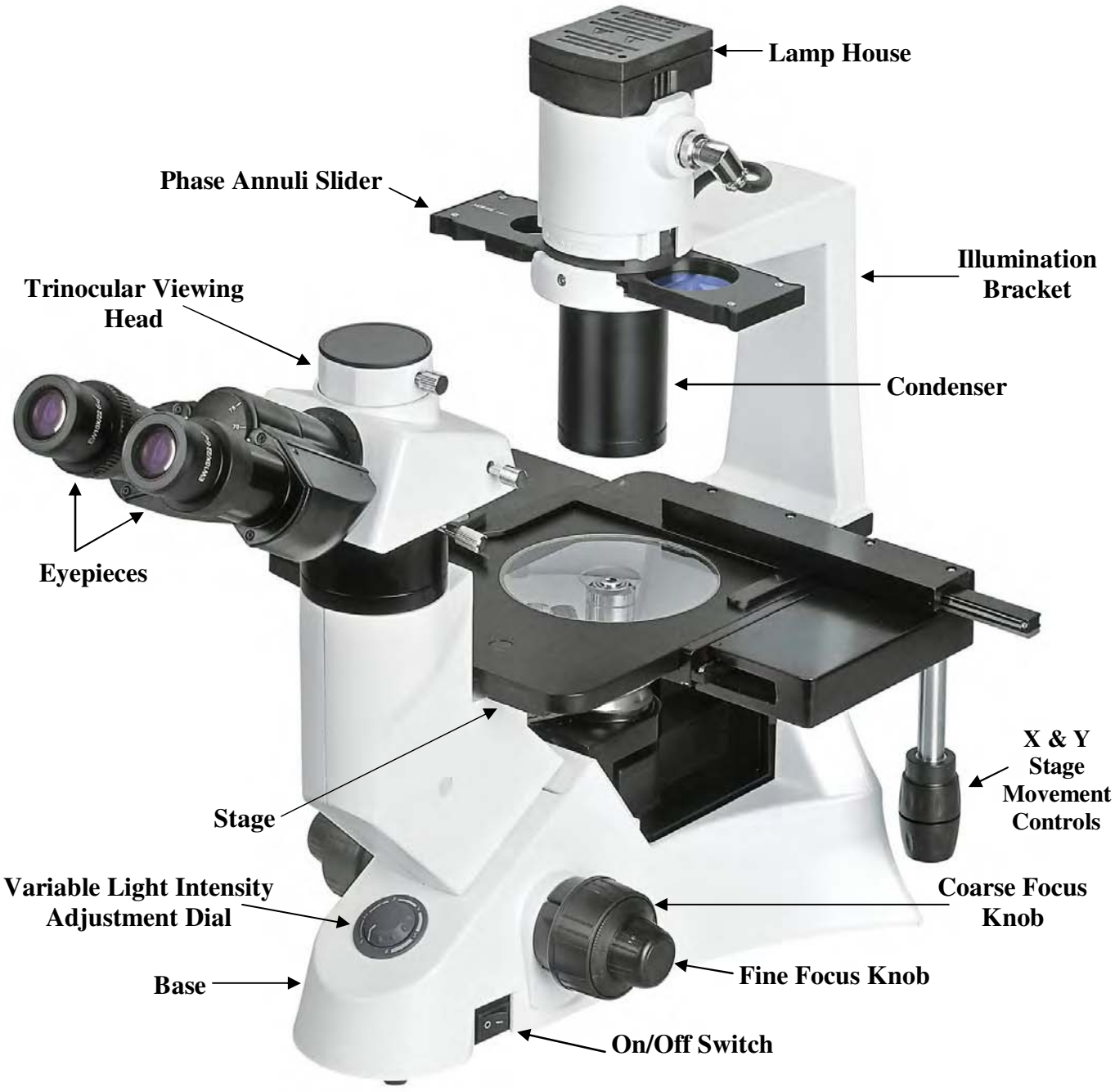
1. Open the shipping carton carefully to prevent any accessory, i.e. objectives or eyepieces, from dropping and being damaged.
2. Do not discard the molded Styrofoam container; the container should be retained should the microscope ever require reshipment.
3. Keep the instrument out of direct sunlight, high temperature or humidity or 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. **CAUTION**: The lamp, lamp house (Fig.1-3) and adjacent parts will become very hot. Do not touch these parts until they have completely cooled. Never attempt to handle a hot halogen bulb.
6. All electrical connectors (power cord) should be inserted into an electrical surge suppressor to prevent damage due to voltage fluctuations.
7. For safety when replacing the halogen lamp or fuse, ensure the main switch is off (“O”), remove the power cord, and replace the halogen bulb after the bulb and the lamp house has completely cooled.
8. Confirm that the input voltage indicated on your microscope corresponds to your line voltage. The use of a different input voltage than indicated will cause severe damage to the microscope.
9. When moving the microscope, hold the instrument with one hand on the lower portion of the eyepiece tube (Fig. 1-1) and the other hand on the illumination bracket (Fig. 1-2)
10. **Halogen lamp: 6 volt 30 watts. Do not use a lamp with different specifications.**

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 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. Oil immersion objectives should be cleaned immediately after use by removing the oil with lens tissue or a clean, soft cloth.
4. Store the instrument in a cool, dry environment. Cover the microscope with the dust cover when not in use.
5. 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 distributor can arrange for this service.

SAFETY SYMBOLS

Symbol	Meaning
	The surface is very hot. Do not touch with your hands.
	Before using, please read the instructions carefully. Improper operation may result in injury or microscope malfunction.
—	The main switch is “on”
O	The main switch is “off”



3032 INVERTED MICROSCOPE SERIES

2. Assembly 3032

2.1 Assembly Diagram

The following figure shows the correct installation sequence of the components. Assemble the components in the exact numerical sequence as in the diagram.

- ★ **Inspect all optical surfaces for dust and debris; clean if necessary.**
- ★ **Please save the hexagonal wrench for future use.**
- ★ **Retain all stryofoam cartons if reshipment is ever required.**

Figure 2

2.2 Assembly Steps

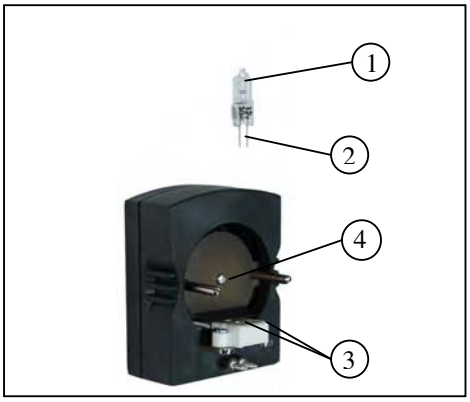


Figure 3

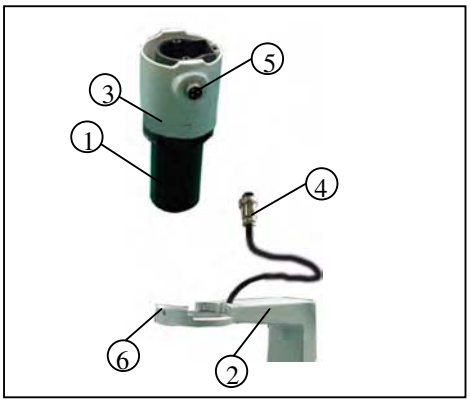


Figure 4

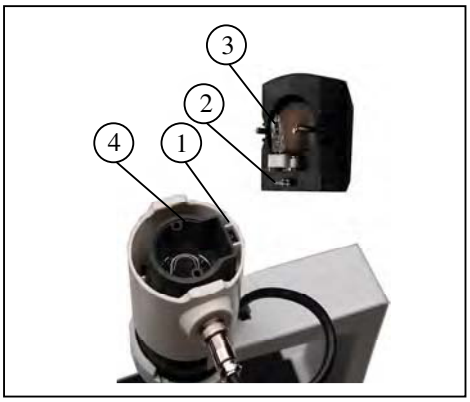


Figure 5

2-2-1 Installing and Replacing the Lamp (Figure 3）

✧ **Use the specified halogen lamp: 6V30W**

Wrap the bulb (1) with gauze or lint free paper; press the pins (2) into the socket (3) in the lamp house.

When replacing the lamp turn the main switch to “O” (off) and remove the power cord. Allow the lamp, lamp house and the adjacent areas to sufficiently cool before handling. The lamp will become very hot and will cause burns.

★ Do not touch the halogen bulb with your hands. Fingerprints on the bulb may shorten the bulb life or interfere with the illumination. Clean all fingerprints with a dry soft cloth.

2-2-2 Installing the Condenser Illumination Assembly（Figure 4）

1. Insert the condenser illumination unit (1) into the bracket (2).
2. Turn the condenser illumination unit at clockwise about 90 until the “AS” mark of filter holder③ is facing forward.
3. Keep the screws the of condenser illumination unit and the holes of the bracket aligned. Tighten the screws with the supplied hexagon wrench.
4. Insert BNC connector cable ④ into the BNC connector plug ⑤.

2-2-3 Installing the Lamp House (Figure 5)

Keep the BNC connector plug① and the lamp house pin② aligned. Also keep the bolt③ and the condenser jack④ aligned. Then gently push the lamp house into the illumination unit until they are completely connected.

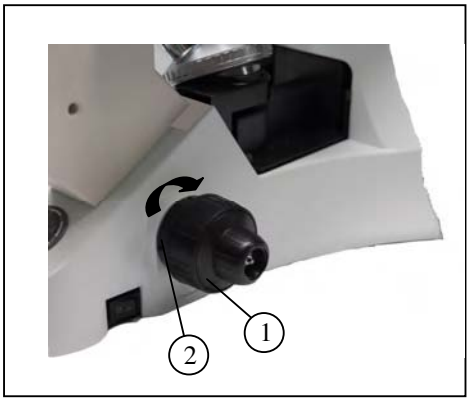


Figure 6

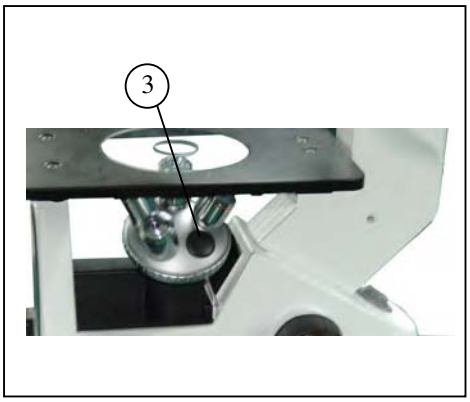


Figure 7

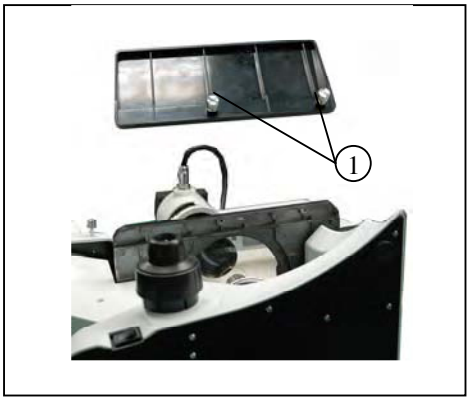


Figure 8

2-2-4 Installing the Objectives（Fig. 6 & 7）

1. Turn the coarse focusing knob① clockwise until the nosepiece reaches its lowest position. The tension control collar (2) has been factory adjusted.
2. Install the lowest magnification objective into the nosepiece. Then, in a clock-wise direction, rotate the nosepiece and install each succeeding higher magnification objective.
3. When changing objective magnifications, rotate the nosepiece until you hear a “click” sound. This ensures the objective is centered in the optical light path.

★ Inspect the objectives regularly for dirt and oil; clean if necessary.

★ Cover all unused nosepiece holes with a nosepiece plug③ to prevent dust and contamination from entering.

★ Use the 10x objective to initially focus the image of your specimen.

2-2-5 Attaching the Mechanical Stage and Stage Extension（Figure 8）

1. Attach the mechanical stage to the right side of the fixed stage by tightening the two thumb screws on the underside of the mechanical stage.
2. Attach the stage extension to the left side of the fixed stage by tightening the two thumb screws (1) on the underside of the stage extension.

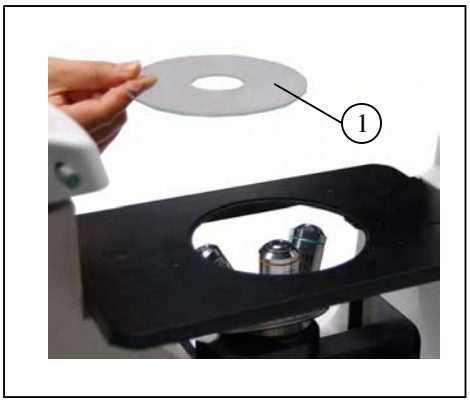


Figure 9

2-2-6 Installing the Stage Plate（Figure 9）

1. Install the glass stage plate ① into the stage opening.

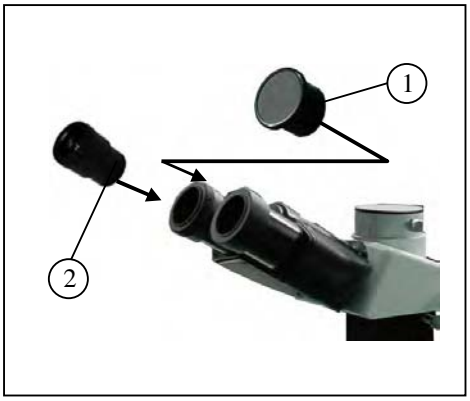


Figure 10

2-2-7 Installing the Eyepieces（Figure 10）

1. Remove the protective caps on the eyepiece tubes①.
2. Insert completely the eyepieces into eyetubes.

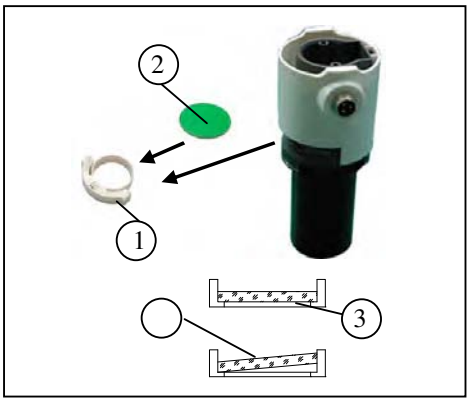


Figure 11

2-2-8 Installing the Color Filters (Figure 11)

★ Allow the color filter to cool completely before you change them. Remove the filter holder①, and then insert the color filter ②required.

● Mount the color filter so it lays flat ③ in the holder as shown.

★ The color filter must be laying flat. If not, the filter has been installed incorrectly④.

● More than one filter may be installed only if the total thickness is less than 11mm.

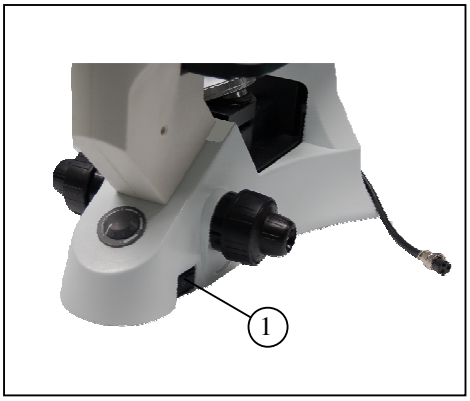


Figure 12

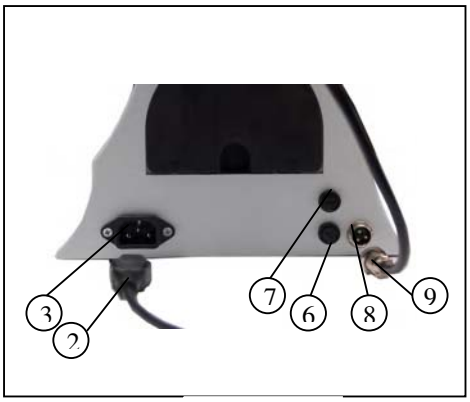


Figure 13

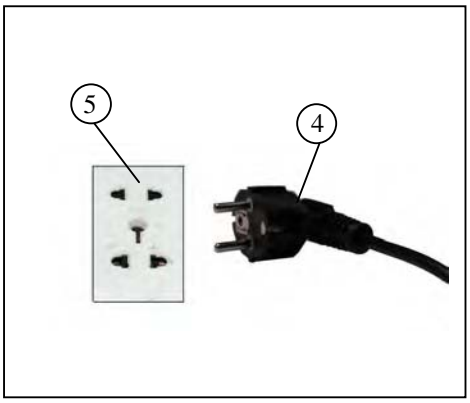


Figure 14

2-2-9 Connecting the Power Cord（Fig.12, 13 and 14）

★ Do not place stress or strain on the power cord. These will damage the cord and cause a danger to the user.

1. Turn the main switch ① to "O" (off) before connecting the power cord.
2. Insert the power cord plug ② into the electrical connector ③.
3. Insert the power cord ④ into an electrical receptacle (5).
4. Insert the BNC connector plug ⑨ into the BNC connector jack ⑧.

★ Ensure the power cord is connected to a grounded receptacle.

Use of an electrical surge suppressor receptacle is highly recommended.

2-2-10 Replacing the Fuse (Figures 12 & 13）

Turn the main switch ① to "O" (off) before replacing the fuse. Unplug the power cord. Rotate the fuse holder ⑥ out of the base ⑦ with a flat edge screwdriver, replace the fuse, then insert the fuse holder and tighten.

★Fuse rating: 250V，500mA.

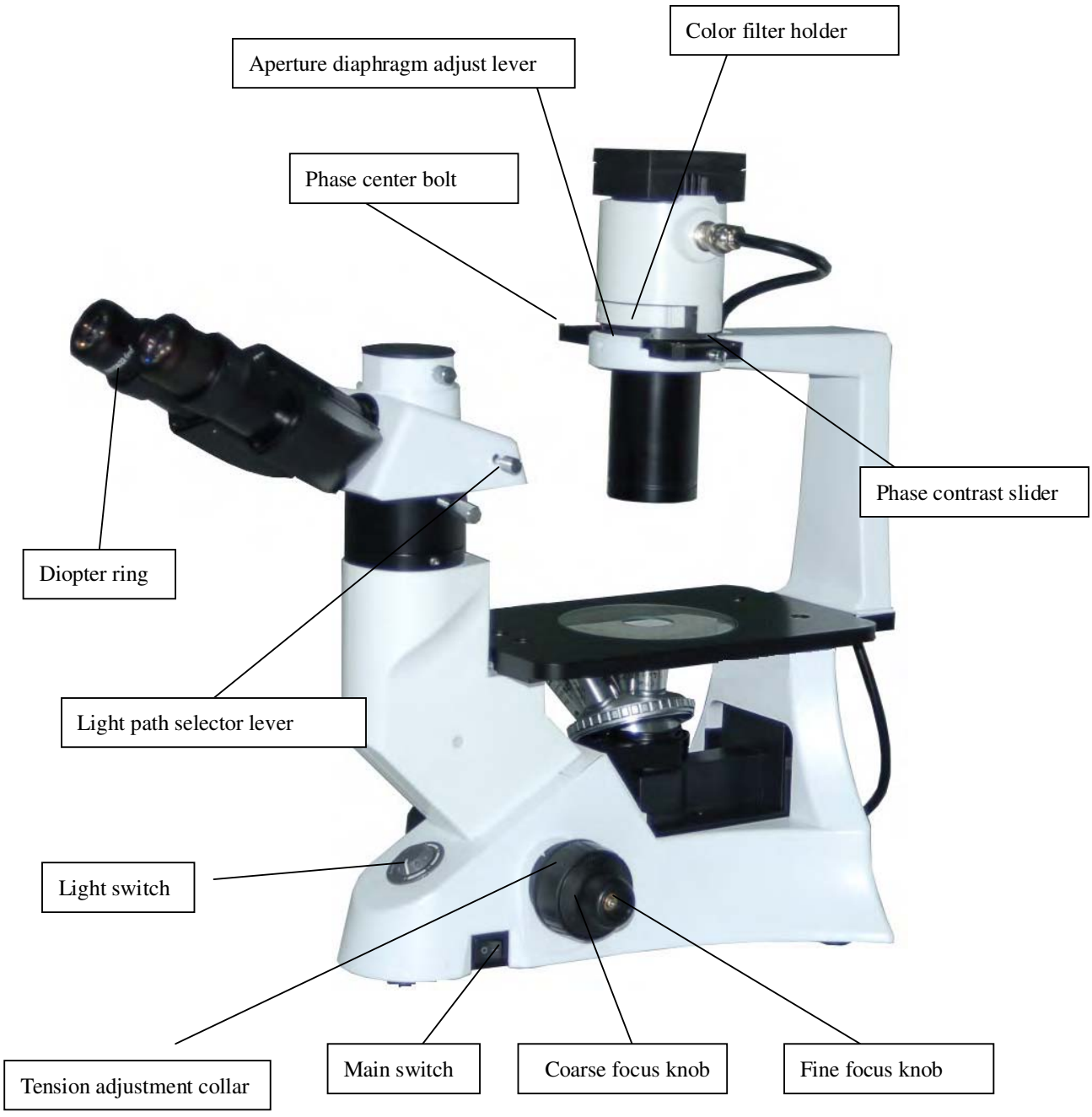

Color filter holder
Aperture diaphragm adjust lever
Phase center bolt
Phase contrast slider
Diopter ring
Light path selector lever
Light switch
Tension adjustment collar
Main switch
Coarse focus knob
Fine focus knob

Figure 15

4-1 Microscope base

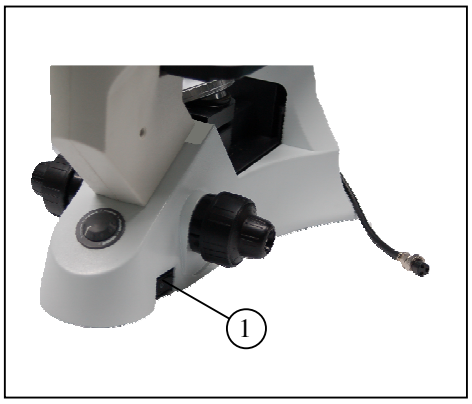


Figure 16

4-1-1 Turning on the Lamp（Figure 16）

Connect the power cord; turn the main switch ① to "—" (on).

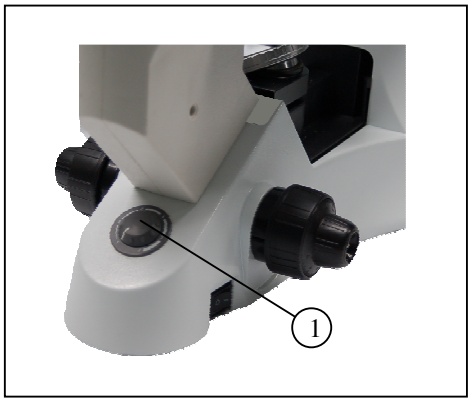


Figure 17

4-1-2 Adjusting the Brightness（Figure 17）

Rotate the variable light intensity dial (Fig. 17-1) clockwise to increase the brightness. Rotating the dial counterclockwise reduces the brightness.

Using the lowest feasible brightness will increase the bulb life.

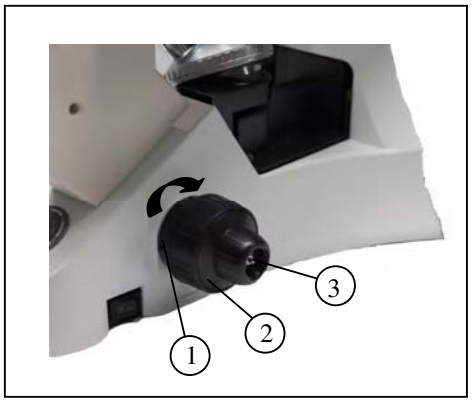


Figure 18

4-1-3 Adjusting the Tension Adjustment Collar（Figure 18）

★ The tension of the coarse focus knob ② has been factory adjusted.

Rotate the tension adjustment collar ① in the direction shown by the arrow (Figure 18) to increase the tension of the coarse focus knob ②. Rotating the collar in the opposite direction will decrease the tension.

The coarse focus knob is too loose if the nosepiece drops automatically or if the specimen looses focus soon after focusing with the fine focus knob ③. Tighten the tension adjustment collar if either of these occurs.

4-2 Stage

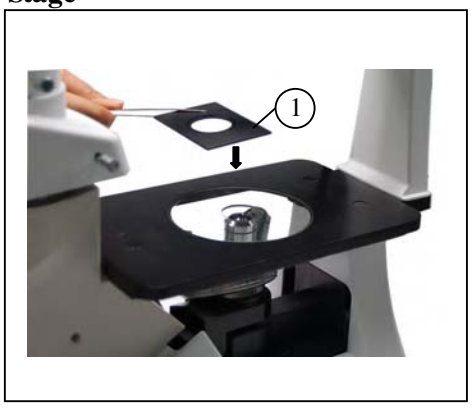


Figure 19

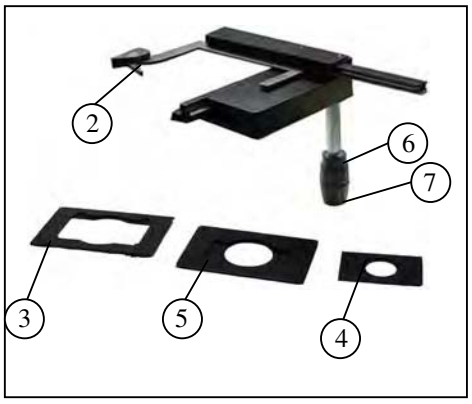


Figure 20

4-2-1 Viewing the Specimen（Figures 19 & 20）

For optimum viewing, ensure the thickness, as marked on each objective (0.17mm or 1.2mm) is the same as your container, dish or slide.

Use the appropriate bracket to hold your Terasaki well plate (3), culture dish (4), flask (5) or slide (5). A larger flask may be placed directly on the stage. Slides may also be placed by securing with the slide holder (2).

The specimen is positioned by turning the X (6) and Y (7) stage movement controls.

4-3 Viewing Adjustments

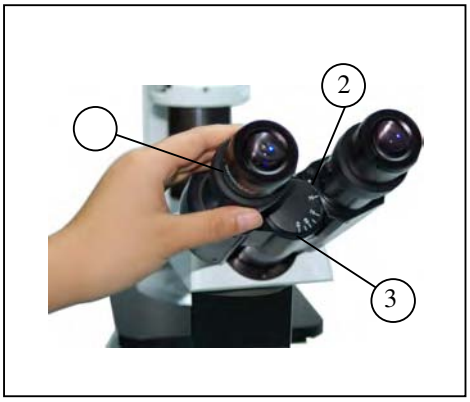


Figure 21

Figure 22

4-3-1 Diopter Adjustment（Figure 21）

1. Using the 10x objective and your right eye only, observe your specimen through the right eyepiece and bring it into focus,
2. Then observe the specimen with your left eye only through the left eyepiece. If the specimen is not in focus, rotate the diopter ring① until a sharp image is obtained.

The diopter range is ±5

4-3-2 Interpupillary Distance Adjustment（Figure 22）

While observing with both eyes, hold the left and right prism eye tubes. Rotate the eye tubes around the central axis. The interpupillary distance is correct when the left and right fields of view coincide completely with one image.

The interpupillary distance range is 48-75mm.

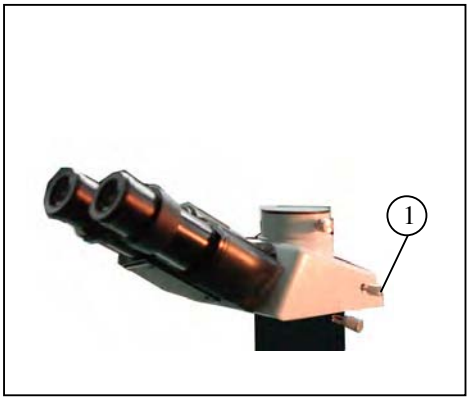


Figure 23

4-3-3 Switching the Light Path（Fig.23）

★ The light path desired is obtained by pulling out or pushing in the light path selector lever ①.

- For binocular observation, push the light path selector lever "in" completely.
- For trinocular observation, pull the light path selector lever "out" completely.

Light Path Selector Lever	Illumination Proportions	Applications
Pushing in the lever completely	100% for Binocular observation	Binocular observation
Pulling out the lever completely	20% for Binocular observation and 80% for Trinocular observation	Binocular observation, video monitor, computer monitor and microphotography
Epi Fluorescent Models	100% Binocular or 100% Trinocular	Fluorescence Applications

4-4 Illumination Unit

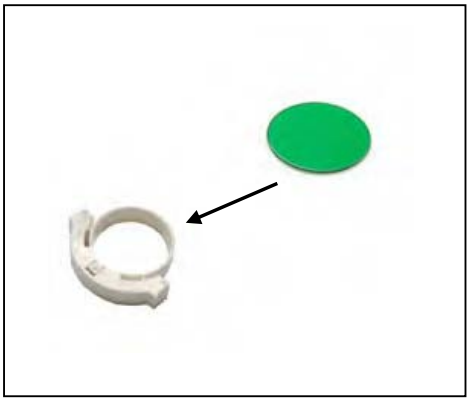


Figure 24

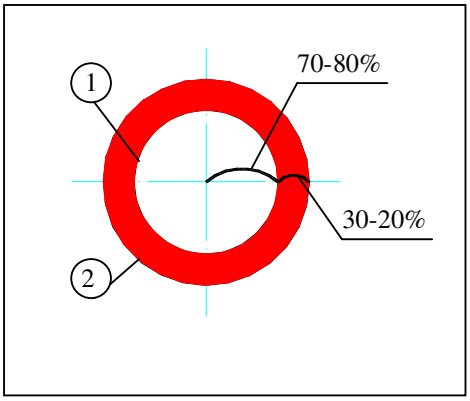


Figure 25

4-4-1 Using Color Filters（Figure 24）

Select the appropriate color filter according to the type of illumination being used. Insert the filter into the filter holder.

The filter holder can hold multiple filters up to a total thickness of 11mm or less.

Color Filter	Usage in Microscopy
IF550	Green Filter use for phase contrast microscopy
LBD	Blue Filter use for bright field observation and microphotography

4-4-2 Using the Aperture Diaphragm（Figure 25）

- When using bright field observation, the aperture diaphragm is used to control the numerical aperture of the illumination system not the brightness. Only when the numerical apertures of the objective and the illumination system are equal can higher image resolution, contrast, and increased depth of field be obtained.
- Generally, when observing the chromatic specimens, the N.A. of the condenser aperture diaphragm is adjusted to 70-80% of the numerical aperture marked on the objective.

To adjust the aperture diaphragm, remove the eyepiece then looked into the viewing tube. Your field of view will appear as Figure 25. The proportion may be changed by turning the aperture adjustment lever: (①is the image of the aperture diaphragm & ② is the edge of the objective).

5. Phase Contrast Microscopy 3032

5-1 Nomenclature

Figure 26

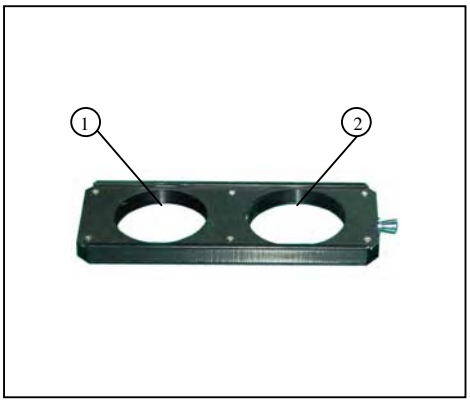


Figure 27

5-1-1 Phase Contrast Objective (Figure 26)

The microscope's standard phase objectives are 10x and 20x. They are mounted on the objective turret as described in 2-2-4.

5-1-2 Phase Contrast Annulus Slider (Figure 27)

- The phase annulus ring has been centered. The phase annulus ring may be adjusted by using the centering telescope as described in 5-2-2.
- The 10X/20X phase ring ① is used with the 10X and 20X phase contrast objectives. The empty opening ② is used for bright field observation.

5-2 Installation and use

Figure 28

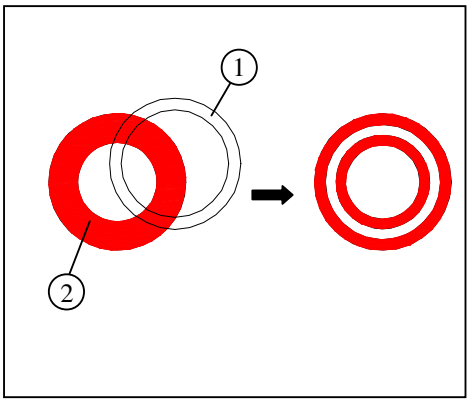


Figure 29

Figure 30

5-2-1 Installing the Phase Contrast Slider（Figure 28）

1. With the slider ① facing upwards (the surface with printing), insert it into the illumination system.
2. Brightfield and phase contrast light rings have their own position. Move the slider until you hear the "click" to ensure the ring or the opening is centered in the light path.
3. When observing with a phase contrast objective, keep the aperture diaphragm adjustment lever ② in the position "O" (open).

5-2-2Centering Telescope (Figures 29 and 30）

The phase annulus has been pre-centered. Adjustments will usually not be required with normal usage.

If adjustments are required:

1. Place the specimen on the stage and focus as usual.
2. Remove the eyepiece without the diopter adjustment and replace it with the centering telescope.
3. Ensure sure the matched phase contrast objective and annulus ring in the phase contrast slider are in the center of the light path.
4. Using the centering telescope to observe the light ring's image ① and the phase contrast ring's image②. If the light ring's image is not sharp, turn the recessed screws in the phase annulus slider until you can see a clear image of the light ring② superimposed on light ring (1). The best image will be obtained only when the two rings coincide.
5. Changing containers, dishes or slides of different thicknesses will require re-adjustment of the phase annulus.

6. Microscope Video and Photography 3032

6-1 Microscope Video

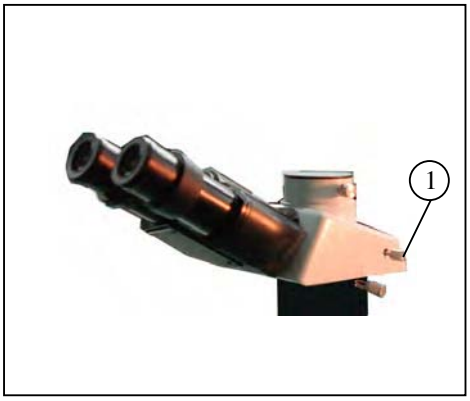


Figure 31

6-1-1 Selecting the Light Path（Figure 31）

1. For binocular observation, push the light path selector lever (1) in completely.
2. Focus your specimen as usual.
3. For video or camera usage, pull horizontally on the light path selector lever until it is completely pulled out.

6-1-2 Installing the Video Adapter（Figure 32）

1. Loosen the locking thumb screw ① on the trinocular viewing head and remove the protective cap②.
2. Remove the protective caps on the both ends of the video adapter③.
3. Screw the threaded end into the CCD/CMOS port and tighten the thumb screw on the adapter (3).
3. Install the accessories into the vertical port and tighten the thumb screw ①.
4. Attach your video camera to the video port (4).

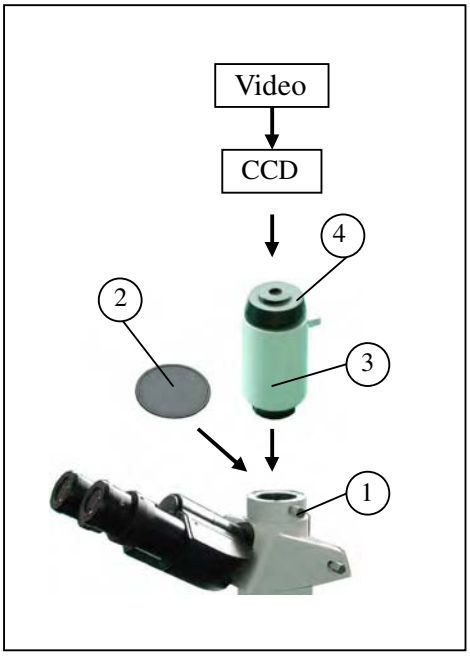


Figure 32

6-1-3 Focusing（Figure 32）

Focus on your specimen while observing through the eyepieces. Ensure the light path selector lever is fully pulled out. Observe the image on the video or computer monitor. If the image is not in focus, turn the revolving video tube④ until the image is sharp.

6-2 Microscope Photography

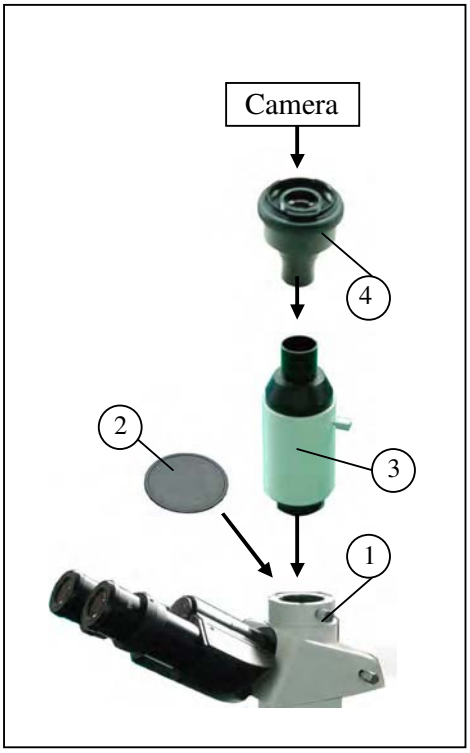


Figure 33

6-2-1 Selecting the Light Path (Figure 31)

1. For binocular observation, push in completely the light path selector lever (1).
2. Focus your specimen as usual.
3. For microphotography, pull horizontally on the light path selector lever until it is completely pulled out.

6-2-2 Installing the Photo Camera（Figure 33）

1. Loosen the locking thumb screw① on the trinocular viewing head and remove the protective cap②.
2. Install the adapter③ into the vertical port, and tighten the thumb screw ①.
3. Insert the camera adapter into ④ into the camera port.

- Camera magnification = objective magnification x camera lens magnification

★ **The shutter on some cameras may cause a jarring impact when photographing through the microscope. To weaken the impact and obtain a clear image, select a longer exposure time.**

6-2-3 Focusing

Focus as usual in the binocular mode. When using the microscope for photography, use the camera's viewfinder to focus the specimen. Please refer to the camera's user manual for additional details.

7.Specifications 3032

Optical System	Infinity Optical System
Viewing Head	Compensation Free Trinocular Head Inclined 30º Division ratio: 20% for Binocular Viewing and 80% for Video Imaging & Microphotography
Eyepiece	Wide Field Eyepiece 10X; 22 mm field of view
Nosepiece	Reversed Quintuple Nosepiece
Objectives	Infinity Long Working Distance Plan Achromatic: 4X & 40X Infinity Long Working Distance Plan Phase Contrast: 10X & 20X
Focusing System	Coaxial Coarse and Fine Focusing System Sensitivity and Graduation of Fine Focus: 0.002mm Movement Range(from the surface focus of stage plate): up 8mm, down 3mm
Mechanical Stage	Size: 250mm x 160mm Movement Range: 120mm（width）×78mm（length）
Illumination	Halogen Lamp 6volt 30watt; Variable intensity
Condenser	Long working Distance Condenser, N.A. 0.3; Working Distance 72mm

Objective Specifications

TYPE	MAGNIFICATION	NUMERICAL APERTURE（N.A）	WORKING DISTANCE（mm）	CONJUGATE DISTANCE（mm）	FOCUS DISTANCE（mm）	COVER SLIP THICKNESS
Infinity Long Working Distance Plan Achromatic Objective	4X	0.1	25.2	∞	45	—
	40X	0.6	3.2	∞	45	1.2mm
Infinity Long Working Distance Plan Phase Contrast Objective	10X	0.25	11	∞	45	0.17mm
	20X	0.4	6	∞	45	0.17mm

TROUBLESHOOTING GUIDE

If a problem occurs during the course of use, please refer to the tables below before contacting your distributor.

OPTICAL		
Problem	**Cause**	**Corrective Measure**
Darkness at the periphery or uneven brightness in the field of view	Revolving nosepiece not in click stop position	Revolve the nosepiece to click-stop position by swinging the objective correctly into the optical path
Dirt or dust on the viewfield	Dirt or dust on the lens - eyepiece, condenser, objective, collector lens or specimen	Clean the lens
Poor image quality	No coverglass attached to the slide	Attach a 0.17mm coverglass
	Coverglass is too thick or thin	Use a coverglass of the appropriate thickness (0.17mm)
	Slide may be upside down	Turn slide over so the cover-glass faces up
	Immersion oil is on a dry objective (especially the 40xR)	Check the objectives, clean if necessary
	No immersion oil used with 100xR objective	Use immersion oil
	Air bubbles in immersion oil	Remove bubbles
	Condenser aperture is closed or open too much	Open or close properly
	Condenser is positioned too low	Position the condenser at the upper limit
IMAGE PROBLEMS		
Image moves while focusing	Specimen rises from stage surface	Secure the specimen in the slide holder
	Revolving nosepiece is not in the click-stop position	Revolve the nosepiece to the click-stop position
Image tinged yellow	Blue filter not used	Use daylight blue filter

IMAGE PROBLEMS		
Problem	**Cause**	**Corrective Measure**
Image tinged yellow	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial
Image is too bright	Lamp intensity is too high	Adjust the light intensity by rotating the intensity control dial
Insufficient brightness	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial
	Aperture diaphragm closed too far	Open to the proper setting
	Condenser position too low	Position the condenser at the upper limit
MECHANICAL PROBLEMS		
Image will not focus with high power objectives	Slide upside down	Turn the slide over so the cover glass faces up
	Cover glass is to thick	Use a 0.17mm cover glass
High power objective contacts slide when changed from low power objective	Slide upside down	Turn the slide over so the cover glass faces up
	Cover glass is to thick	Use a 0.17mm cover glass
	Diopter adjustment is not set properly	Readjust the diopter settings
Lamp does not light when switched on	No electrical power	Check power cord connection
	Lamp bulb burnt out	Replace bulb
	Fuse blown out	Replace fuse
Slippage of focus when using the coarse focusing knob	Tension adjustment is set too low	Increase the tension on the focusing knobs
Fine focus is ineffective	Tension adjustment is set too high	Loosen the tension on the focusing knobs

Order online anytime at **www.polysciences.com**

US Headquarters

400 Valley Road
Warrington, PA 18976

(800) 523-2575 / (215) 343-6484
(800) 343-3291 / (215) 343-0214 fax
info@polysciences.com
www.polysciences.com

European Headquarters

Handelsstrasse 3
D-69214 Eppelheim
Germany

(49) 6221-765767
(49) 6221-764620 fax
info@polysciences.de

Asia-Pacific Headquarters

Polysciences Asia Pacific, Inc.
2F-1, 207 DunHua N. Rd.
Taipei, Taiwan 10595

(886) 2 8712 0600
(886) 2 8712 2677 fax
info@polysciences.tw

Our catalog lists over 3,000 unique and specialty products that are used by histology professionals, lab technicians, pathologists, chemists and scientists worldwide. Visit **www.polysciences.com** to learn more about our product lines.