



User's Manual

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Introduction

Congratulations on the purchase of your new AmScope microscope!

This manual is designed for the 340 series microscopes (B340 & T340).

Though the two models have identical bases, the B340 is equipped with a binocular head (two eyepieces tubes), while the T340 is equipped with a trinocular head (two eyepiece tubes and a third photo port on the top).

Please take a few minutes to familiarize yourself with the features and functions of your new microscope.

If you'd like more information on microscopes, parts, or accessories, please visit our website at:

www.iScopeCorp.com

We highly recommend you study this manual thoroughly before operating the microscope and that you keep it on hand for future reference.

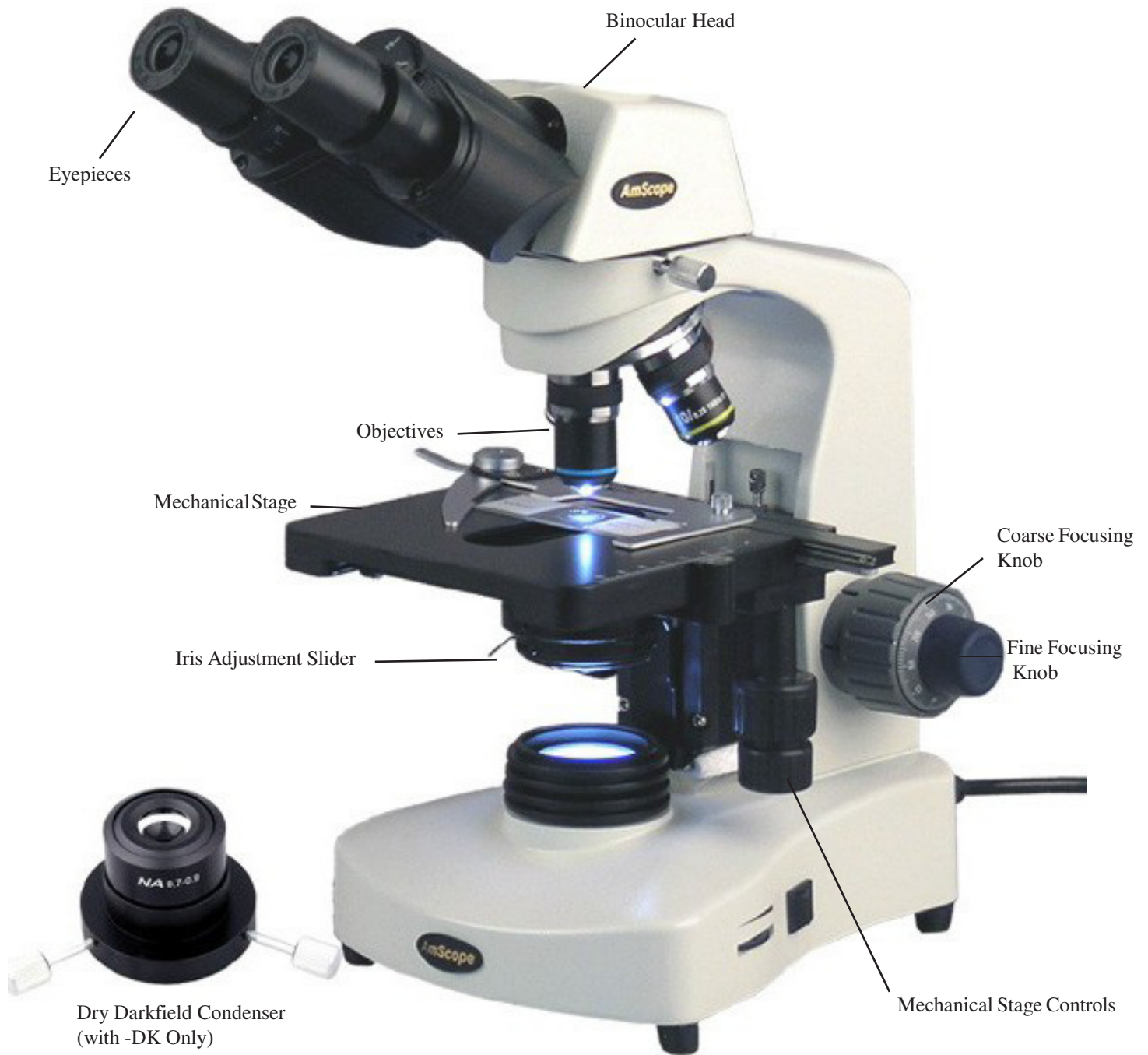
If you have additional questions or need assistance, please send us an email at:

info@amscope.com

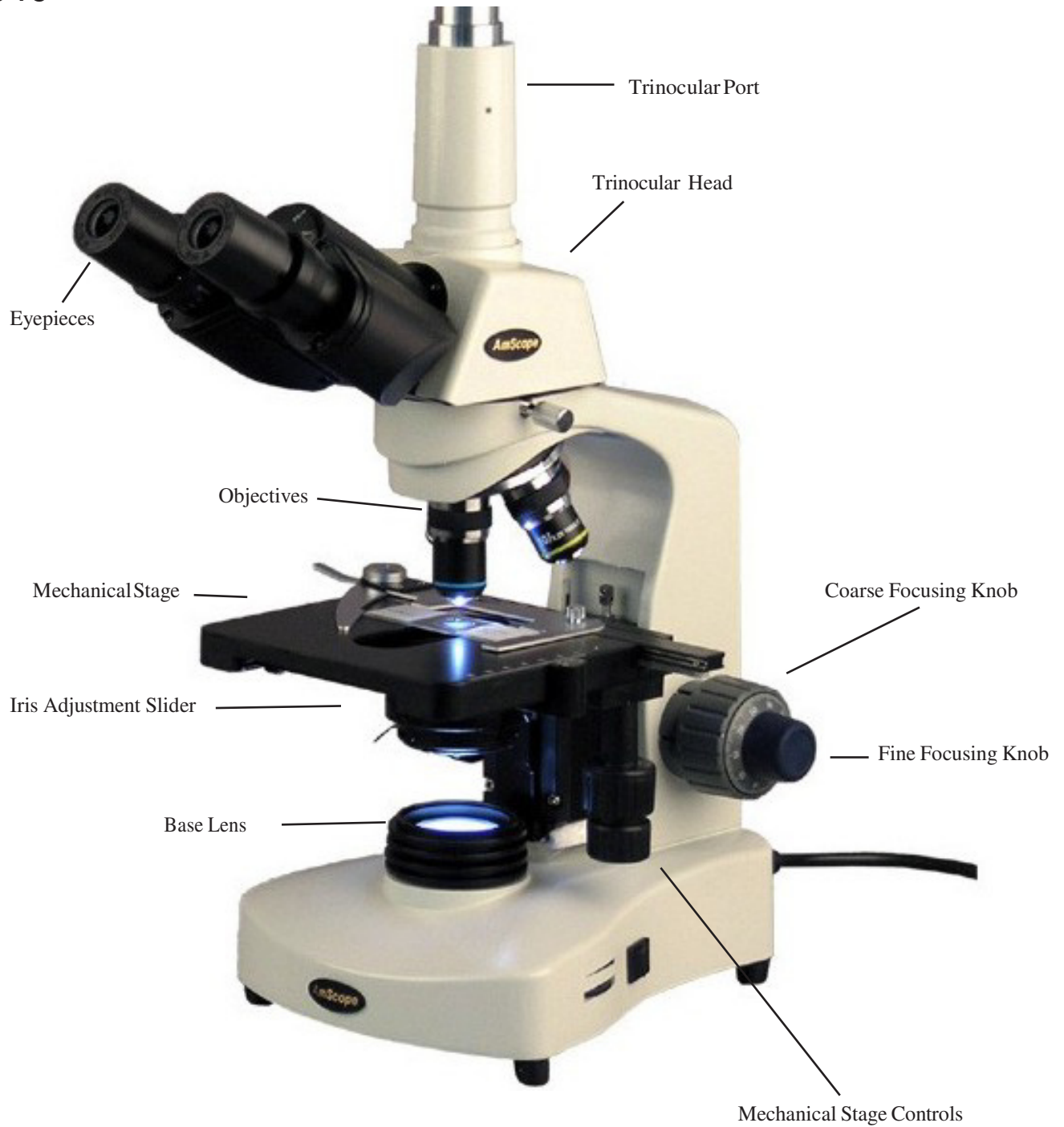
Safety Precautions

1. As the microscope is a precision instrument, always handle it with care, avoiding impact or abrupt movement during transportation. Do not shake the package.
2. Do not place the microscope in direct sunlight or in high heat. Keep it indoors in a dry and clean place with temperatures between 32-100 degrees F (0-40 degrees C), and in maximum relative humidity of 85%.
3. Avoid touching the lenses on the objectives and the eyepieces so that oil and dirt from your fingerprints do not obstruct your view.
4. Before turning the power on, make sure that the power supply voltage is consistent with the voltage of your microscope.

B340



T340



Definition of Parts

Adjustable Trinocular Port

Threaded port with adjustable length of attachment of digital or video camera

Base Lens

Directs the light source towards the slide

Coarse Focusing Knob

Used to initially bring the slide into the sight and focus

Condenser & Iris Diaphragm

Controls the amount of light that hits the slide

Condenser Screw

Screws the condenser in place, securing it to the mechanical stage

Dimmer

Controls the amount of light that escapes from the base lens

Dioptr

Allows the focus to be perfected for both eyes, independent of each other

Fine Focusing Knob

Used to refine focus to clear image

Head Lock Screw

Screws the microscope head into place

Limit Stop Knob

Limits the upward movement of the mechanical stage in order to avoid damaging the slide and objective

Mechanical Stage

Mechanically moves the slide along an X and Y axis for optimal positioning

Nosepiece

Houses the objective lenses

Rotating Head

Adjusts eyepieces to fit the distance between the user's eyes for added comfort

Tension Knob

Adjusts the tension of the focusing knobs

Assembly

1. First, take the styrofoam container out of the cardboard carton and lay it on its side, paying attention to which side is labeled up. Remove the tape and open the container carefully so as to avoid dropping and damaging the optical items. Check carefully to ensure that all parts and accessories are intact.

2. Check the packing list to ensure that you've received all items:

- One Microscope Body
- One Binocular (B340) or One Trinocular (T340) Head
- One Trinocular Photo Port (for T340 only)
- Four Infinity Objectives (4x, 10x, 40x, 100x)
- 10x Widefield Eyepieces
- 16x Widefield Eyepieces (for -A models only)
- 20x Widefield Eyepieces (for -B models only)
- Blue Color Filter (for LED models only)
- Blue, Green, & Yellow Color Filters (for halogen models only)
- One Bottle of Immersion Oil
- One Spare Fuse
- One Spare 6V/15W Bulb
- One Dust Cover

Note: If you have an LED model, there is no need to change light bulb on it. If the light is not working, please ensure that the unit is plugged in and the power is on. If still not working, contact us, as there may be another cause. The LED bulb is designed to far outlast the other components on the unit.

3. Remove the microscope body from the box and remove the plastic protective covering. The body of the microscope is composed of the base, the stage, the arm, and the nosepiece.

4. Loosen the metal knob located directly above the nosepiece (the head-lock screw) completely. Place the head (flat, circular side down) into the circular opening on top of the arm. Tighten the head-lock screw to secure the head in place.

5. For the T340 model, screw the photo port onto the top of the microscope head (trinocular C-mount port).

6. Remove the eyetube caps and drop the desired eyepieces into the eyepiece ocular tubes. Be sure to avoid touching the lens to ensure no artifacts appear in your image.

7. Screw the objectives into the microscope nosepiece from the lowest magnification to the highest, again avoiding touching the lenses.

8. Plug in the microscope and turn it on.

Setting Up

1. Loosen the head lock screw and adjust the microscope head so that it is in a comfortable position for observation. Lock the head-lock screw.
2. With both eyes open, look into the eyepieces. Adjust the interpupillary distance by holding the eyepiece tubes and rotating the eyepiece tubes either towards or away from each other until only one circle of light is seen by both eyes.
3. Place the specimen to be studied on a glass slide (or use a prepared slide). Place it on the stage, holding it snugly in place with the metal slide holders (clips) of the mechanical stage.
4. Using the mechanical stage's slide controls, center the specimen over the stage opening, lining it up with the light and the objective lens.
5. To adjust the illumination, slowly turn the dimmer knob on the right side of the body until the desired intensity of light is achieved. You may also adjust the iris on the light source itself by rotating the ring around the base lens or the iris on the condenser, so please make sure all are adjusted to the correct positions.

Focusing

1. Turn the nosepiece to choose an objective. It is easiest to use the lowest magnification first (4x objective) to locate and focus on the specimen. As you move up in magnification you may need to refocus the image a little each time.
2. When using the 100x objective, a drop of immersion oil should be placed between the cover slip and the objective to minimize distortion caused by air. Always be sure to wipe the oil off of the objective with either lens cleaning paper or a nonabrasive, lint free cloth.
3. Begin focusing by first looking with one eye through the eyepiece without the diopter. Close your other eye. Use the coarse focusing knob to adjust the height of the stage until the sample comes into clear focus.

Note: You may loosen the limit-stop screw (located rear of the mechanical stage) in order to give yourself a larger-range of motion for fine tuning the focus.

4. Once the image is clear in your field of view, you will want to use the fine focusing knob to tune it for best results.

Note: Please be careful when moving the mechanical stage if you need to re-center the sample, or if moving the stage very close to the objectives. The limit stop is designed to prevent impact between objective and slide, so when it is off you will be able to damage the microscope. For safety, when using the 40x and 100x objectives, engage the limit stop once you have it close or in contact with the objective (if using oil contact is required).

Adjusting the Condenser & Diaphragm

1. Using the condenser-adjustment knob, you can change the distance between the light condenser and the stage. This allows you to control the concentration of the light hitting your slide.
2. By changing the aperture (hole size) of the iris diaphragm, you can adjust the background brightness. Adjust the aperture of the iris diaphragm using the iris adjustment slider located directly under the stage.
3. If you want to use a color filter, swivel the filter holder out, towards you. You can now place the desired color filter into the circular opening. Slide the filter holder back to original position before observation.

Note: The filter holder is placed in from the factory in a manner in which it swings out and hits the arm of the microscope (backwards). If this happens, simply grip the condenser assembly and rotate it. It may take a small amount of force to rotate it, but after doing so, you will be able to swing the filter holder out towards the front of the unit for easier operation.

Using the Trinocular Port

The AmScope T690 model is uniquely designed so that you can view the image through the eyepieces and the trinocular port simultaneously.

This feature allows the images through the microscope's eyepieces, and those displayed on your computer screen or television be viewed at the same time (although unless using 20x eyepieces to match your camera, the image may differ in magnification). You do not need an adapter to attach your AmScope camera to the trinocular port, however you may need one if you have a non-AmScope camera. Our photoport is a 23mm size.

Attaching a Camera

1. If your camera has a C-mount, simply screw the camera onto the trinocular port.
2. If your camera has a 23mm mounting size, remove the C-mount from the top of the trinocular port by loosening the screw. Then, drop the camera directly into the trinocular port. It should slide in without issue.
3. To focus through the trinocular port, simply turn middle portion of the tube.

Setting the Stage's Stop-Limit

1. Unlock the stop-limit, which is the switch inside the left hand focusing knob.
2. Adjust the stage to the desired maximum height.
3. Lock the stop-limit. This will allow you to limit the movement of the stage from the bottom of the range up to the point that it is set at.
4. To reset it, unlock the stage and reset the stage to the new height that you would like it to limit at. If no limit is desired, simply unlock the stop-limit, but be careful when using the oil immersion lens (100x), as with no limit you can hit the slide, damaging the lens or your sample.

Adjusting Focusing Tension

1. To adjust the tension of the focusing knobs, first locate the black ridged tension knob on the inside of the coarse focusing knob.
2. To decrease tension, rotate the adjustment forward, towards the stage (counterclockwise). To increase, rotate away from the stage (clockwise).

Note: If your stage is slipping down after setting the focus, you need to increase the tension.

Changing the Bulb

1. Before changing the light bulb, first pull the plug out of the electrical socket and wait for the lamp to cool down. The light can get hot when a halogen system is in use, so please be careful to avoid being burned.
2. Please be sure to remove the eyepieces from the unit before turning it upside down to prevent them from falling and breaking.
3. Remove the door at the bottom of the microscope by unscrewing it.
3. You may now change the bulb by removing and replacing it. Be sure that the bulb is not hot before touching it to avoid burning. Reinstall door and continue use of microscope.

Maintenance/Precautions

- All glass surfaces must be kept clean. Fine dust on the optical surface should be blown off using a hand blower or gently wiped off with a soft lens paper tissue/nonabrasive lint free cloth.
- Carefully wipe off oil or fingerprints on the lens surfaces using tissue moistened with a small amount of lens cleaner (we recommend Sparkle brand optical cleaner).
- Do not use Sparkle to clean other elements of the microscope. Use a neutral detergent on any plastic or painted surfaces.
- Do not assemble or disassemble the microscope's electrical components yourself without advisement from one of our technicians. Doing so will void your warranty unless by advisement of one of our technicians to do so.
- After use, cover the microscope with the provided dust cover.
- Keep your AmScope microscope in a dry, clean location in order to prevent rust or other damages.

340 Series Specifications

Parts	Specifications	B/T340A	B/T340B	B/T340A-LED	B/T340B-LED
Extreme WF Eyepiece	WF10X/18mm	x	x	x	x
	WF10X/18mm w/ Pointer				
	WF10X/18mm w/ Reticle				
	WF16X/13mm	x		x	
	WF20X/10mm		x		x
	WF25X/10mm			x	x
DIN Achromatic Objectives	4X/0.10	x	x	x	x
	10X/0.25	x	x	x	x
	40X(spring)/0.65	x	x	x	x
	60X(spring)/0.85				
	100X(spring,oil)/1.25	x	x	x	x
DIN Plan Objectives	4X				
	10X				
	40X(spring)				
	100X(spring, oil)				
30 Degree Viewing Head	Binocular Sliding, 360 Degree Swiveling	x (if B-)	x (if B-)	x (if B-)	x (if B-)
	Trinocular Sliding, 360 Degree Swiveling	x (if T-)	x (if T-)	x (if T-)	x (if T-)
Trinocular Port	C-Mount Photoport	x (if T-)	x (if T-)	x (if T-)	x (if T-)
	23mm Photo Port	x (if T-)	x (if T-)	x (if T-)	x (if T-)
Focusing Nosepiece	Coaxial Focusing System	x	x	x	x
	Quadruple Nosepiece	x	x	x	x
Stage	120mm x 110mm Mechanical Stage	x	x	x	x
	Movement Range: 70mm x 30mm	x	x	x	x
Condenser	Abbe, NA= 1.25	x	x	x	x
Diaphragm	Iris Diaphragm	x	x	x	x
Illumination	Halogen	x	x		
	LED			x	x
Lamp	6V/15W	x	x		
	LED			x	x
Filter	Blue/Yellow/Green	x	x		
	Blue			x	x

Optional Accessories

Parts	Description	Model #	Purpose
Eyepieces	20x	EP20X30	Obtaining 80x, 200x, 800x, and 2000x magnification powers
	25x	EP25X30	For obtaining 250x and 2500x magnification powers
	10x w/ Pointer	EP10X30P	For easier identifying of objects
	10x w/ Reticle	EP10X30R	For measuring objects
Objective	4X	PA4X-INF	
	10X	PA10X-INF	
	40X	PA40X-INF	
	100X	PA100X-INF	
Camera	CMOS Digital	MU035 (350k) MU130 (1.3mp) MU300 (3mp) MU500 (5mp) MU800 (8mp) MU900 (9mp) MU1000 (10mp)	To capture images, video, or view live display on a computer (PC/Mac OS X)
	Calibration Micrometer	MR400	To calibrate the camera software for on screen measurements
	CCD Digital (VGA, Trinocular Only)	CCD-MT	To view live display on a computer monitor (VGA)
	CCD TV/Video (Trinocular Only)	CCD-NP	To view live display on a television (RCA)
Stage Warmer		TCS-100	For controlling stage temperature

Objectives

Type	Magnification	Model Number/ Numerical Aperture (N.A.)	Medium	Parfocal Distance (mm)	Magnification Marks (Color Ring)
DIN Achromatic Objective (195mm)	4X	A4X / .10	Air	45	Red
	10X	A10X / 0.25	Air	45	Yellow
	40X	A40X / 0.65	Air	45	LightBlue
	100X	A100X / 1.25	Cedar Oil	45	White
DIN Plan Objective (195mm)	Plan 4X	PL4X / .10	Air	45	Red
	Plan 10X	PL10X / 0.25	Air	45	Yellow
	Plan 40X	PL40X / 0.65	Air	45	LightBlue
	Plan 100X	PL100X / 1.25	Cedar Oil	45	White

Electrical System

There are two options for electrical systems for this series of microscope. The light source is dependent on which model you have, but can either be a 6V/20W halogen, a 6V/30W halogen, or an LED system.

1. 220V~240V power supply: 220V~240V $\pm 10\%$, 50Hz

This electrical system is CE and GS certified

2. 100V~120V power supply: 100V~120V $\pm 10\%$, 60Hz

This electrical system is UL certified.

All units come standard as 110V units unless an upgrade to a 220V system is requested. Upgrade fee is dependent on which unit is purchased.

Parameters

Magnification	-A Model: 40x-1600x -B Model: 40x-2000x -C Model: 40x-2500x
Field of View	$\Phi 0.8\text{mm} \sim \Phi 4.5\text{mm}$
Mechanical Tube Length	165mm
Object to Primary Image Distance	195mm
Fine Focusing Sensitivity	0.002mm

Technical Terms & Concepts

Total Magnification

Total magnification of a microscope is calculated by the magnification of the objective multiplied by the magnification of the eyepieces.

-Ex: (10x Eyepieces) x (4x Objective) = 40x Total Magnification

Field of View

Linear field of view of the eyepiece divided by the magnification of the objective.

Numerical Aperture (N.A)

Calculated by $n \sin \alpha$ (max), the Numerical Aperture (N.A) is an important parameter that marks the features of the objective and condenser's image quality and resolution. The "n" is a refractive index of the medium (air or immersion cedar oil) between the objective lens and the specimen. The " α " is 1/2 of the angle between the aperture on the objective and path of light. The larger the N.A, the higher the resolution of the objective (and better quality of the image).

Object to Primary Image Distance

The distance between the object plane and the primary image plane. The conjugate distance is fixed.

Mechanical Tube Length

The distance between the objective shoulder and the ocular shoulder.

Common Issues

Symptom	Cause	Remedy
OPTICAL ISSUES		
One side of the field of view is darker	The nosepiece is misaligned	Turn the nosepiece until it clicks into place
	Stains or dust has accumulated on the condenser, objective, eyepieces, or base lens	Clean all lenses with lens cleaner or a lint free non-abrasive cloth
Obstructions are observed in the field of view	Stains, dust, or dirt has accumulated on the specimen	Clean the slide or use a new specimen if sample is destroyed
	Stains, dust, or dirt have accumulated on the lens	Clean the lens
Unclear Image	There is no cover slip on the slide	Add a cover slip. The objectives are designed for use with a 0.17mm cover slip, so it is a requirement to use one for proper images.
	The cover slip is not standard sized	Replace the cover slip with the appropriate 0.17mm thickness slip
	The immersion oil has accumulated on the dry objective	Thoroughly clean the objective lens with lens cleaner or a lint free nonabrasive cloth
	No immersion oil is used with the 100x objective	Use immersion oil for better clarity and resolution
	Air bubble in the immersion oil	Pop the air bubble
	Used wrong oil	Use standard Type A or Type B cedarwood oil
	The aperture is not open to an appropriate diameter	Adjust the aperture to have the light just larger than the size of the condenser
	The condenser is not in the correct position	Adjust the condenser height with the knob on the left of the microscope underneath the stage to the top, then adjust down until desired
	Stain or dust has accumulated on the lens in the inlet of the head	Clean the lens with lens cleaner or a nonabrasive lint free cloth, as well as spray with compressed air
One side of the field of view is dark or the image moves while focusing	The specimen slide is not fixed	Secure the slide to the stage with clips
	The condenser is not in the correct position	Adjust the condenser height with the knob on the left of the microscope underneath the stage to the top, then adjust down until desired
	The nosepiece is not in the right position	Turn the nosepiece until it clicks into place
The field of view is not bright enough	The iris diaphragm is not big enough	Adjust the iris diaphragm to allow the light to be just larger than the condenser. There is one on the base lens with the illuminator and one on the condenser.
	Stains, dust, or dirt has accumulated on the condenser, objective, eyepieces, or base lens	Thoroughly clean all lenses with lens cleaner or a lint free nonabrasive cloth

Common Issues (Continued)

Symptom	Cause	Remedy
OPTICAL ISSUES		
Image color is not correct	No filter is used or filter is in use	Remove color filter if natural light is desired, or insert desired filter
	The condenser height is not correct	Adjust the condenser height with the knob to the left of the microscope underneath the stage
MECHANICAL ISSUES		
The objective touches the cover slip	The cover slip is not standard sized	Replace the cover slip with the appropriate 0.17mm thickness slip
	The limit-stop is set too high or not engaged	Be careful to avoid contact between objective and the slide when the limit stop is not engaged (unless using the 100x objective with oil). To reengage, focus the sample, then lock the limit stop into place to set max height at a safe but usable distance.
Unable to move the slide smoothly	The slide is not secured correctly	Adjust the slide to use the stage clips and secure the sample
	The mechanical stage is not properly secured	Tighten the mechanical stage screws to better secure the stage
The coarse focusing knob won't raise the stage	Limit-stop is engaged	Disengage the limit stop on the rear of the stage
The fine focusing knob won't raise the stage	Limit-stop is engaged	Disengage the limit stop on the rear of the stage
ELECTRICAL ISSUES		
The bulb/light source flickers	The bulb is close to burning out (halogen only)	Replace the bulb. This unit uses our model BH-6V15W.
	The circuit board is malfunctioning (LED only)	Contact us to request a repair/replacement
The microscope does not light up	The microscope is unplugged	Insert the plug into the wall socket to achieve electrical illumination
	The bulb is not inserted correctly (halogen only)	Check the bulb by unscrewing the base (remove eyepieces first to prevent falling out) door and ensuring that the bulb is inserted
	The bulb burned out (halogen only)	Replace the bulb. This unit uses our model BH-12V20W.
	The fuse burned out	Replace with fuse on the bottom of the microscope
The fuse burns out frequently	The voltage is too high	Use the correct power supply (110v if 110v unit, 220v if 220v unit), or get a voltage adapter to convert to the proper electrical system
The bulb burns out frequently	The voltage is too high	Use the correct power supply (110v if 110v unit, 220v if 220v unit), or get a voltage adapter to convert to the proper electrical system
	Used the wrong bulb (halogen only)	Use the correct wattage bulb for the unit. Using a higher wattage than it is rated for can damage your unit (melt components with additional heat), so please be sure to use the correct one. Damage from incorrect usage is not covered under warranty.