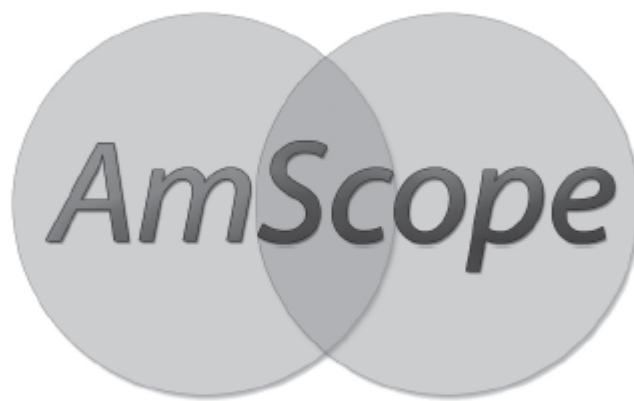




User's Manual

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Introduction

Congratulations on the purchase of your new AmScope microscope! This manual is designed for the IN300 series microscopes. It is designed for the applications involving in large vessels or samples in biology, microbiology, histology immunology and iatrology, etc. Allowing you to observe specimen in culture flasks, Petri dishes or other containers, it comes with long working distance Plan objectives, high quality phase contrast objectives, super widefield eyepieces, 45° inclined trinocular head, offering 40X, 100X, 200X and 400X magnification settings and phase contrast microscopy features. With a long working distance condenser and high-contrast phase contrast objectives, it provides high quality clear microscopy images of the cells in large container or vessels. It is an ideal microscope for observing living cells in micro research laboratories. This inverted microscope is perfect model for universities, medical offices, epidemic prevention department and farming & stock raising labs, etc.

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.amscope.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 °F (0-40 °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.

IN300



IN300-FL



Definition of Parts

Coarse Focusing Knob

Used to initially bring the sample into the sight and focus

Condenser & Iris Diaphragm

Controls the amount of light that hits the sample

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

Filter Box (FL model only)

The housing which contains the filter cubes (dichroic mirrors) for EPI-fluorescent microscopy. Our units contain Blue and Green filters.

Fine Focusing Knob

Used to refine focus to clear image

Fluorescent Shield

Orange shield used to protect the eyes from the intense EPI-fluorescent light

Illuminator Box

Houses the mercury bulb to protect the other components from the intense heat emitted by a mercury bulb.

Mechanical Stage

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

Mercury Bulb (EPI-Fluorescent Illumination) (FL model only)

A very intense illumination method that provides full spectrum light but emits a large amount of heat

Power Box

A separate power source for fluorescent applications that allows heat from the power source to be kept away from the heat from the mercury bulb (which when combined could melt or damage components of the microscope)

Nosepiece Turret

Houses the objective lenses

Trinocular Port

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

Assembly



- | | | |
|---------------------------|---------------------|---|
| 1. Objective | 2. Mechanical stage | 3. Fluorescent Mercury lamp power box (-FL model) |
| 4. Mercury lamp house | 5. Metal stage | 6. Lamp holder |
| 7. Halogen bulb | 8. Filter | 9. Filter holder |
| 10. Protector (-FL model) | 11. Eyepiece | |

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 Inverted Microscope Body
 - One Trinocular Photo Port
 - Four Long Working Distance Plan Objectives (4x, 10x, 20x, 40x)
 - 10x Extreme Widefield Eyepieces
 - 20x Extreme Widefield Eyepieces (for -B models only)
 - 25x Extreme Widefield Eyepieces (for -C models only)
 - Blue & Green Fluorescent Filters (FL models only)
 - One Mercury Bulb (FL models only)
 - One Spare Halogen Bulb
 - One Spare Fuse
 - One Dust Cover
 - Power Cable
 - Power Box (-FL models only)
 - Fluorescent Shield (-FL models only)
3. Remove the microscope body from the box and remove the plastic protective covering.
4. Assemble the microscope according to the figure in the previous page.



5. Plug the microscope in (if non -FL model), and turn unit on. Light should emerge from the light source. If not, adjust the dimmer control ① until it appears.

6. For -FL models, also attach the fluorescent shield to protect the eyes from the intense light of the mercury bulb. Also connect the power box to the mercury bulb housing to provide power to the fluorescent light.

Setting Up

1. 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.
2. Place the specimen to be studied onto the stage of the microscope (slide, flask, beaker, vial, etc). Inverted microscopes are designed to be used with larger samples with the long working distance objectives
3. Using the mechanical stage's slide controls, center the specimen over the stage opening, lining it up with the light and the objective lens.
4. 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. Being focusing by first looking with one eye through the eyepieces. Close your other eye. Use the coarse focusing knob to adjust the height of the stage until the sample comes into clear focus.
3. 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.
4. Because an inverted microscope has long working distance objectives, you will not have the fear of your objectives hitting your sample, however you may need to spend a little more time focusing to achieve focus on the correct plane of view (depth wise) since you will be looking through a petri dish, slide, beaker, or other storage medium for your sample.

Adjusting the Condenser & Diaphragm

1. On an inverted microscope, the condenser assembly is part of the upper housing containing the light source.
2. To adjust the iris diaphragm, simply move the slider to allow the desired amount of light to escape and reach the sample.

Using the Trinocular Port



The AmScope IN300 model is uniquely designed so that you can view the image through the eyepieces and the trinocular port simultaneously without having to replace an eyepiece with a camera.

Push up the selection pole① to use binocular only; Pull down the selection pole① to use binocular AND trinocular port②.

This feature allows the image observing through the microscope's eyepieces to be displayed on your computer screen or television 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 photo port 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.

Fluorescent Microscopy (-FL model only)

Fluorescent microscopy is a very advanced form of microscopy that is used primarily for cell cultures. The applications for this microscopy method can vary, but it does require an advanced technical knowledge of both microscopes and how fluorescence works. Typically, a special dye is used to

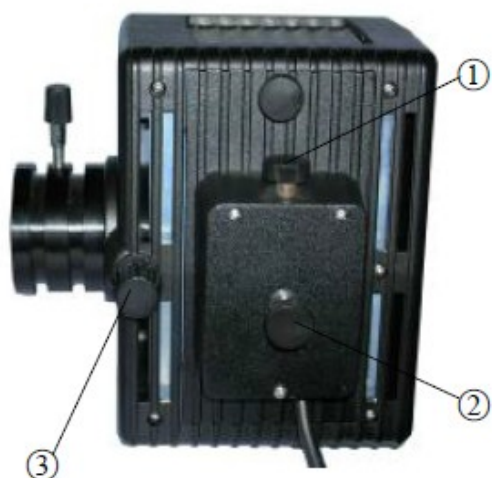
stain the sample, which will glow when a certain type of light excites the cell and stain.

We ask that our customers research and learn this type of microscopy prior to purchasing a fluorescent microscope, as they are quite expensive to purchase without knowing in advance what stains/dyes are to be used with what filters.

This model contains blue and green filters, which means that the light emitted to the sample is blue or green (emission) to see excitations of green and red (respectively). Specific wavelength information on these filters can be found in the specifications section of this manual. Centering of the light is crucial to achieve optimal results, and can be found in the following section.

Centering Fluorescent Bulb (-FL Models only)

1. When operating a fluorescent model the mercury bulb and path of light must be perfectly aligned for desired results. Begin by removing an objective from the turret and rotate the hole into position.
2. Slide a sheet of paper onto the stage to display the light from the mercury bulb. Turn the bulb on.
3. Wait 10 minutes for the bulb to achieve maximum brightness.
4. Adjust the filter stop and aperture stop controls on the connecting tube between the light box and the main body of the microscope. They should be set to allow the maximum amount of light through the tube for clearest visibility when centering the bulb.

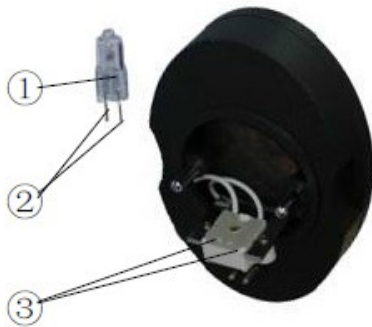


5. On the housing for the mercury bulb, there are a variety of adjustment knobs. These knobs allow you to relocate the bulb until the filament can be seen on the paper. Each knob controls a different dimension of movement of the bulb. Adjust each knob until the filament can be clearly seen on the sheet of paper.

6. Once the filament can be seen on the paper, the light is centered at its brightest point.

7. Readjust the filter stop and aperture stop to correct levels. The aperture stop should allow the most amount of light in, while the filter stop should be adjusted until the light is just larger than the aperture viewed on the paper.

Changing the Halogen Bulb (Top)

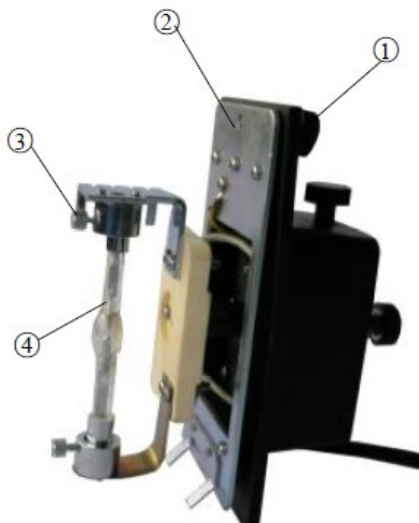


1. Before changing the light bulb, first pull the plug out of the electrical socket and wait for the lamp to cool down. The light can get hot when a halogen system is in use, so please be careful to avoid being burned.

2. Grab the top section of the light housing and pull up to remove the cover around the light.

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.

Changing the Mercury Bulb (FL only)



1. Allow the mercury bulb to fully cool before changing, as this bulb burns extremely hot and can burn you upon touch.

2. Unlock the housing door by unscrewing the top screw on the black housing. Once fully removed, the bulb housing will be removable.

3. Change the bulb and re-secure the housing door. Re-centering will be needed.

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.
- The mercury bulb must be primed before each use by allowing 10-15 minutes of time to heat the bulb up completely. Do not use it for longer than an hour, and allow it to fully cool before turning it on again or you may damage or prematurely burn the sensitive bulb out.

IN300 Series Specifications

Parts	Specifications	IN300TA	IN300TB	IN300TC
Extreme WF Eyepiece	WF10X/18mm	x	x	x
	WF10X/18mm w/ Pointer			
	WF10X/18mm w/ Reticle			
	WF16X/13mm	x		
	WF20X/10mm		x	
	WF25X/10mm			x
DIN Plan Objectives	4X	x	x	x
	10X	x	x	x
	20X	x	x	x
	40X	x	x	x
Viewing Head	Trinocular Head	x	x	x
Trinocular Port	C-Mount Photo port	x	x	x
	23mm Photo Port	x	x	x
Focusing Nosepiece	Coaxial Focusing System	x	x	x
	Quadruple Nosepiece	x	x	x
Stage	Mechanical Stage	x	x	x
Condenser	NA= 1.25	x	x	x
Diaphragm	Iris Diaphragm	x	x	x
Illumination	Halogen Light w/ Dimmer	x	x	x
	Mercury Fluorescence Bulb	FL model only	FL model only	FL model only
Lamp	12V/20W	x	x	x
Filter	Blue & Green Fluorescent Filter	FL model only	FL model only	FL model only

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

Electrical System

There are two options for electrical systems for this series of microscope:

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

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

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	Base: 40x-400x -A Model: 40x-600x -B Model: 40x-800x -C Model: 40x-1000x
Mechanical Tube Length	165mm
Object to Primary Image Distance	195mm
Fine Focusing Sensitivity	0.002mm
Blue Excitation Level (FL model)	450-490nm
Green Excitation Level (FL model)	510-560nm

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) is.

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.

Infinity

Infinity is an optic lens system that allows the entire field of view to be in focus at the same time, allowing for higher quality images to be displayed through the microscope. The focal distance is set to infinity between the objective and the eyepiece prism, also allowing filters to be inserted into the system more easily due to the parallel path of light, rather than focusing on a specific point.

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	The aperture is no open to an appropriate diameter	Adjust the aperture to have the light just larger than the size of the condenser
	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
	The condenser is not in the right position	Condenser is pre-centered from the factory, so no adjustment is needed. Ensure that it is seated properly.
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 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.
	The condenser is not in the right position	Double check that the condenser and light housing is seated properly
	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		
The color of the image is not accurate	The brightness adjustment knob is not in the right position	Adjust the brightness knob to a higher or lower setting for color clarity
MECHANICAL ISSUES		
Unable to move the sample smoothly	The sample is not secured correctly	Adjust and secure the sample
	The mechanical stage is not properly secured	Tighten the mechanical stage screws to better secure the stage
ELECTRICAL ISSUES		
The bulb/light source flickers	The bulb is close to burning out	Replace the bulb. This unit uses our model BH-12V30W for the halogen light, or the MB100 (FL model only) for mercury bulbs.
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	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	Replace the bulb. This unit uses our model BH-12V30W. FL models also use the MB100 mercury bulb.
	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	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.