

SCAN OPTICS

SO-1700LED

WET LAB

MICROSCOPE

USER MANUAL



INTRODUCTION

Please read the following information carefully before installing and using the Scan Optics SO-1700LED wet lab microscope. Scan Optics is responsible for the safety, reliability and performance of the equipment only if it is used in accordance with these instructions.

Environmental storage and packing conditions of 60-95% relative humidity and 10-40 °C, are recommended for this product.

No parts or accessories supplied with this microscope are supplied in a sterile condition.

Apart from those instructions within this manual, there are no user-serviceable parts in this microscope. Scan Optics will retain the discretion to advise whether any repairs may be taken out by external qualified technical personnel, or whether part(s) of the microscope must be returned to the manufacturer's premises for service or repairs to be carried out under warranty or otherwise. Where appropriately qualified technical personnel are identified by a user, and ratified by Scan Optics, then Scan Optics will make available on request any information that will assist in repairing the equipment.

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PARTS LIST

MAIN ASSEMBLIES

Power supply	1
Microscope Assembly	1

CABLES

Mains Cable	1
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OTHER

Focus Knob Sterilisable Covers	4
Zoom Knob Sterilisable Covers	4
Plain Eyepiece	1
Focusable Eyepiece	1

TOOL KIT

Lens Cloth	1
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OPTIONAL ACCESSORIES

SCAN OPTICS PART NUMBER

Pupillary distance setter	SO-1510W
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CAUTIONS

Caution: Do not use this device if damaged.

Caution: Do not attempt to disassemble this device, apart from following the instructions change replacing mould protection which are included in this manual. Servicing should only be performed by accredited Scan Optics service technicians

Caution: Do not immerse any part of this device in liquids.

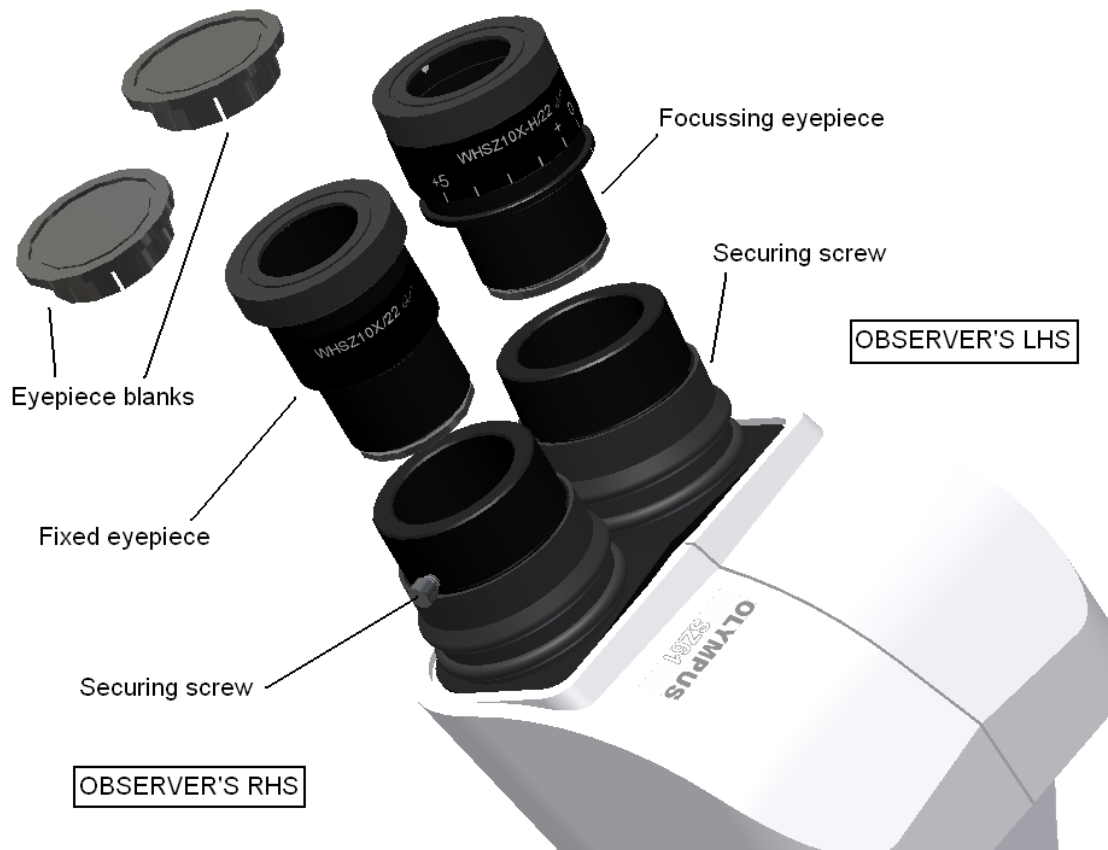
Caution: This equipment is not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Information – Electromagnetic Compatibility: This device is designed to meet the electromagnetic compatibility standard IEC 60601-1-2, and will not interfere with equivalently rated appliances, nor should be susceptible to interference from equivalently rated appliances.

Disposal: Dispose in accordance with all applicable federal, state and local regulations.

ASSEMBLY INSTRUCTIONS

1. Remove the microscope assembly from the carton and place it on a stable flat surface.
2. Remove the power supply from the carton and place it so that it rests on the rubber feet
3. Connect the power supply cable to the socket located on the lamphouse
4. Connect the mains cable to the IEC socket located on the back of the power supply. Connect the other end of the mains cable to a reliable EARTHED mains power supply.
5. Switch on the mains power supply at the mains socket.
6. Remove the eyepiece blanks and insert the eyepieces. Insert the focusing eyepiece in the LHS eyepiece tube from the observer's perspective and secure in place so that the scale marker is easily visible. Place the fixed eyepiece in the RHS eyepiece tube and secure using the screw. Retain the eyepiece caps in a safe place for when storing the microscope.



USING THE MICROSCOPE

Sterilisation

Scan Optics microscopes are supplied with two sets of sterilisable covers – one set may be used while the other set is undergoing sterilisation. Additional sterilisable covers may be purchased from Scan Optics in the event of loss or damage. Simply slip the covers on to the zoom or focus knobs when required.

The covers may be sterilised by:

- boiling
- autoclaving
- chemical sterilisation
- gas sterilisation.

Note that national authorities may require the use of specific sterilisation or disinfection methods.

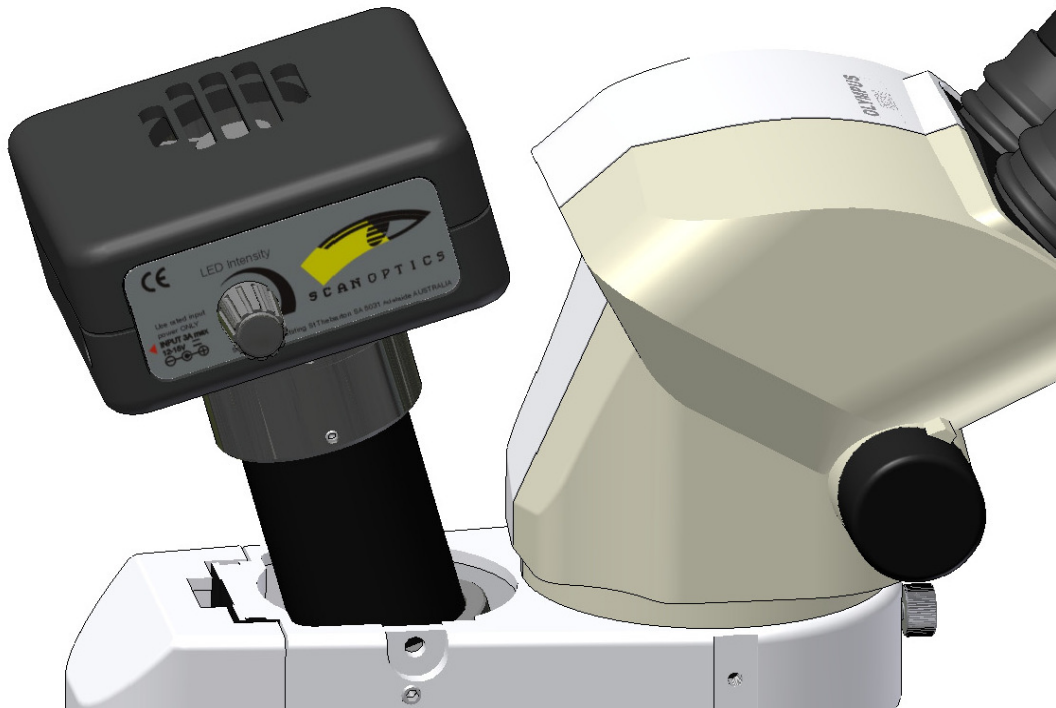
Focussing the microscope

Focussing the microscope in the correct sequence is an important step in setting up for use.

1. Set the pupillary distance of the microscope by moving the eyepieces apart or together as required. The eyepieces are geared together and will move equal distances on either side of the optical centre of the microscope.
2. Set the refractive error scale to zero on the LHS eyepiece.
3. Choose a high magnification zoom setting or one which is typically used in observation.
4. Close the left eye and look through the right eyepiece of the microscope with the right eye only.
5. Focus the microscope slowly until the image is sharply in focus.
6. Close the right eye and look through the left eyepiece of the microscope with the left eye only.
7. Rotate the refractive error adjustment ring on the left eyepiece until the left eye is in focus. The reading on the ring will give an approximate measure of the relative refractive error between the left and right eyes.
8. Look through both eyepieces normally and check that the image is focussed and that stereopsis is achieved.

Changing the light intensity

When the power supply is switched on by turning the intensity adjustment clockwise, a soft click will be heard. Continue to rotate the intensity adjustment knob clockwise to increase intensity. To turn the intensity down rotate in opposite direction. To Turn off, fully rotate the intensity adjustment anti-clockwise until a soft click is heard.



ROUTINE CARE AND MAINTENANCE

OPTICAL HEAD

Cleaning the optical components

The eyepieces, auxiliary objective lens and lamphouse prism should be checked for cleanliness each time the instrument is used. Surface dust should be removed with a clean, soft brush. Fingerprints, irrigation solution residue and grease may be removed by lightly wiping with a cotton cloth or lens tissue moistened with a mixture of 70% ether and 30% absolute alcohol (either ethanol or methanol). Use pure alcohol if no ether is available. **Do not use acetone as it may damage the surface coatings of the lenses.**

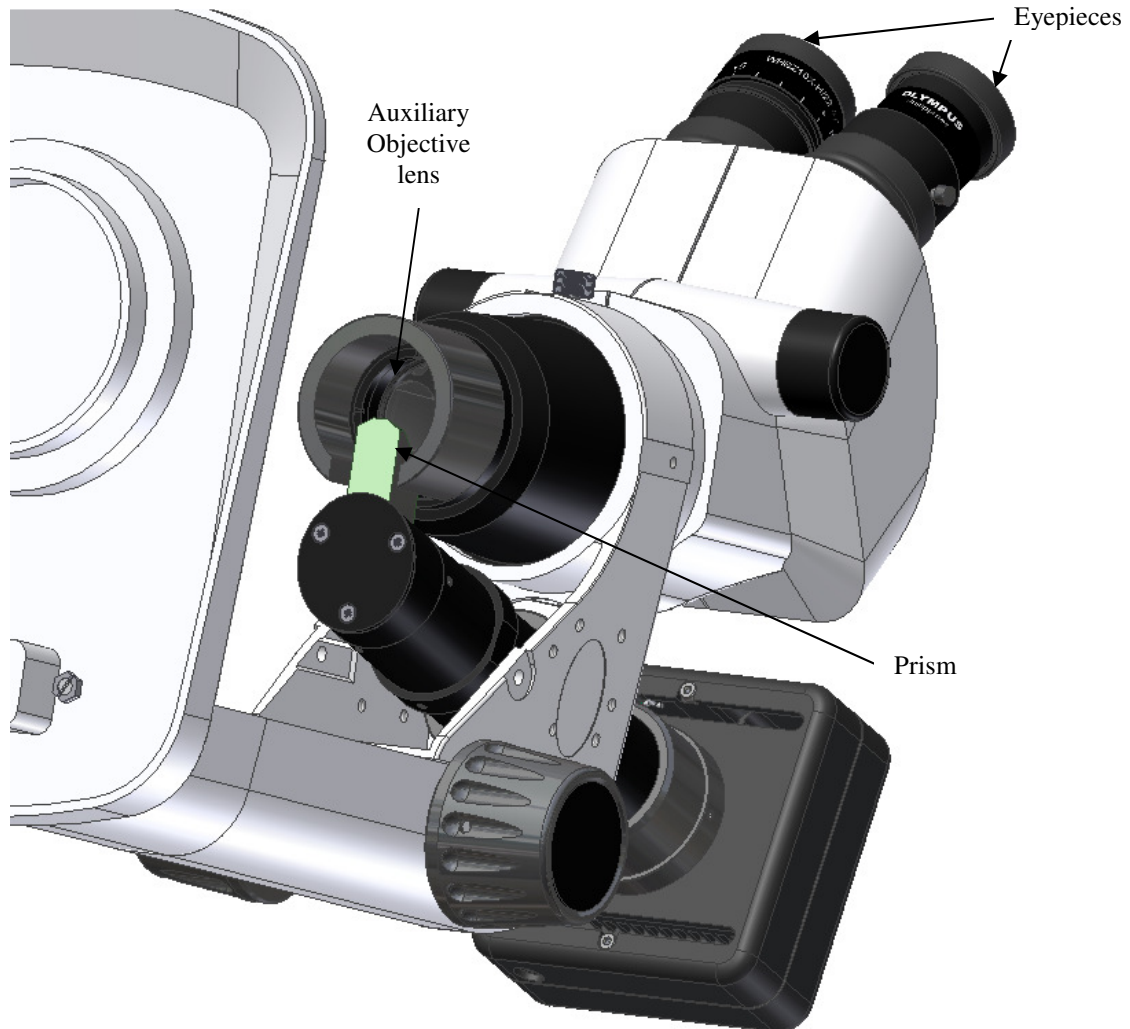


Figure 4

Cleaning the plastic parts and paintwork

Use water based cleaners only.

Do not use any organic solvent such as alcohol, ether or xylene.

Do not dismantle

Apart from instructions specifically mentioned within this manual, no parts inside the optical head of the instrument can be serviced by the user. Attempts to dismantle the optical head or prism cover will make any warranty void.

Protection against mould

In hot and humid climates it is common for mould to grow on optical surfaces. Cleaning and repairing the damage can be expensive and inconvenient. To minimise the risk of mould forming, do not leave the instrument without either eyepieces or eyepiece blanks inserted and always store the optical head in a sealed bag containing silica gel desiccant. Scan Optics SO-1700LED microscopes are fitted with anti-mould protection. In tropical climates, routine checking for the presence of mould is recommended.

LIGHTING SYSTEM***Lamp life***

The SO-1700LED Microscope is fitted with a permanently affixed 27W LED. The LED is rated for about 10 years of life if used under normal conditions. Should the LED prematurely fail, this part is not serviceable and Scan Optics or your local distributor should be contacted for a replacement.

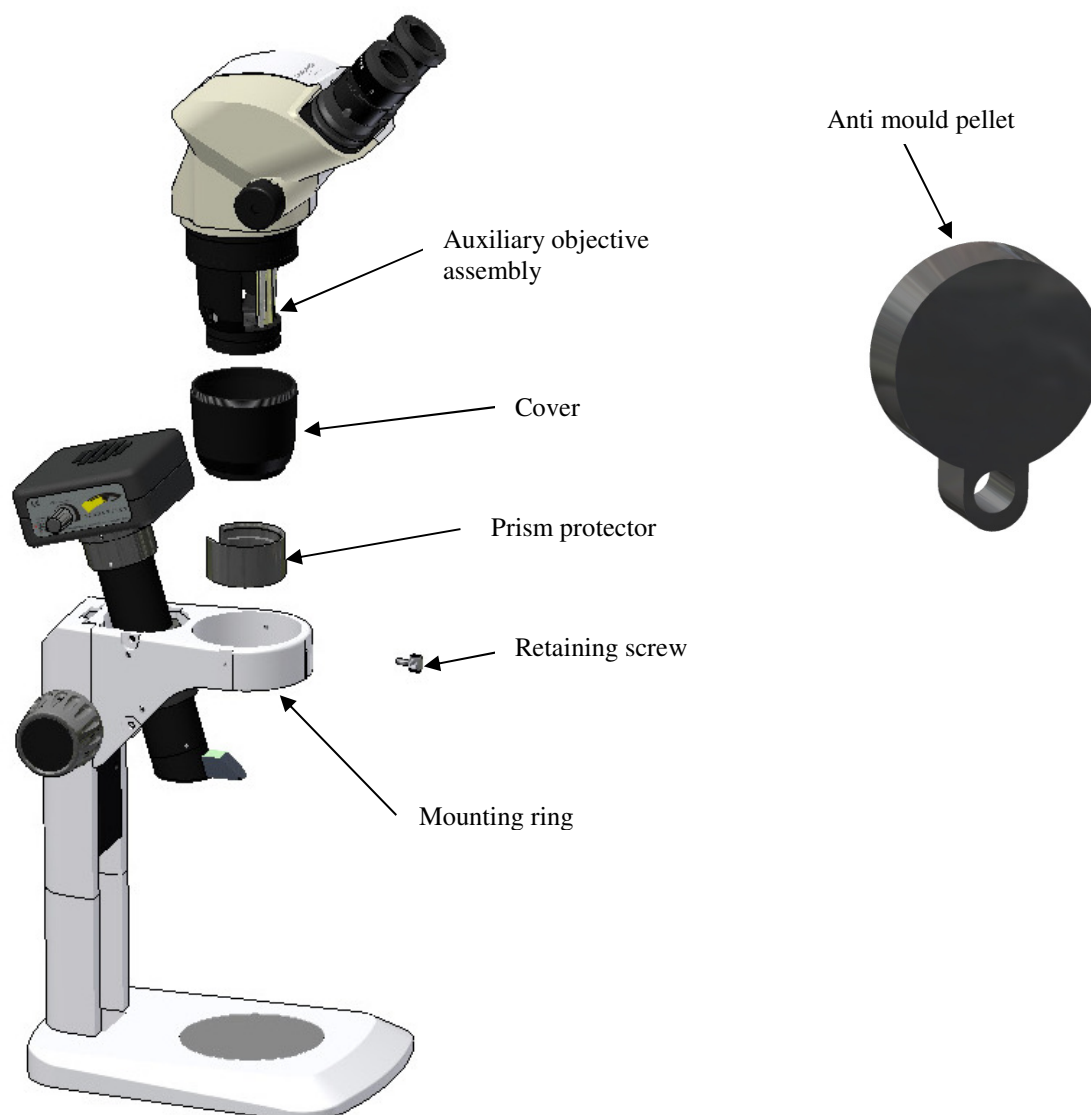
ADVANCED INSTRUCTIONS

Replacing mould protection

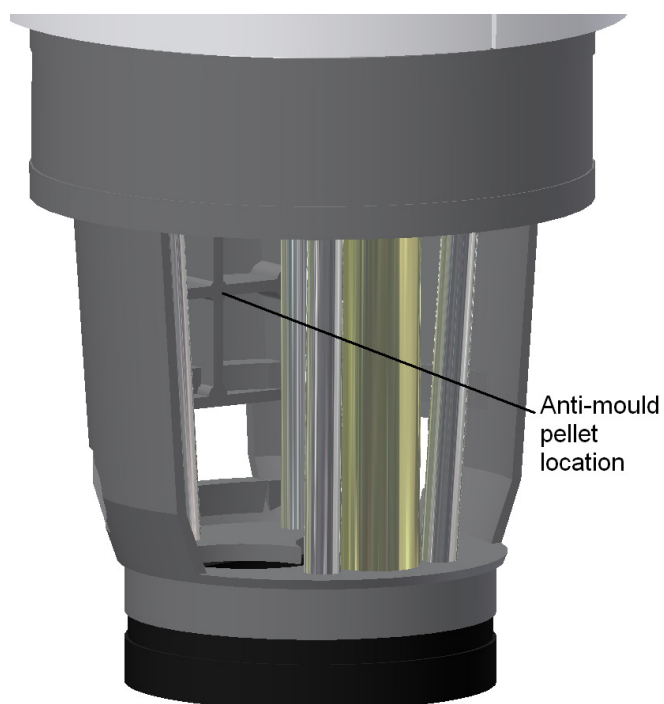
The microscope is fitted with anti-mould protection which is effective for approximately three years. However, the effective life of this protection will depend on environmental factors such as the temperature and humidity of the place where the microscope is stored. Regular inspection of the microscope will help early identification of mould and alert the user of the need to replace the anti-mould protection.

To replace the anti-mould pellet:

1. Zoom the microscope to the *lowest* magnification setting
2. Loosen the retaining screw at the front of the microscope head.
3. Lift the microscope out of the mounting ring
4. Remove the prism protector from the auxiliary objective assembly by prying it apart
5. Unscrew the cover from the bottom of the microscope head. The location of the existing anti-mould pellet will be revealed from the front of the microscope head.
6. Remove the old anti-mould pellet.



7. Remove the adhesive backing from the new anti-mould pellet and place it in the same location.
8. Zoom the microscope in and out all the way to make sure the zoom optics do not dislodge the pellet.
9. Screw the cover back on.
10. Replace the prism protector on the auxiliary objective assembly, making sure that the slot lines up with the location of the lamphouse prism.
11. Replace the microscope head back in the mounting ring and re-tighten the retaining screw.
12. Update the anti-mould label on the microscope head, or replace it with a new label.

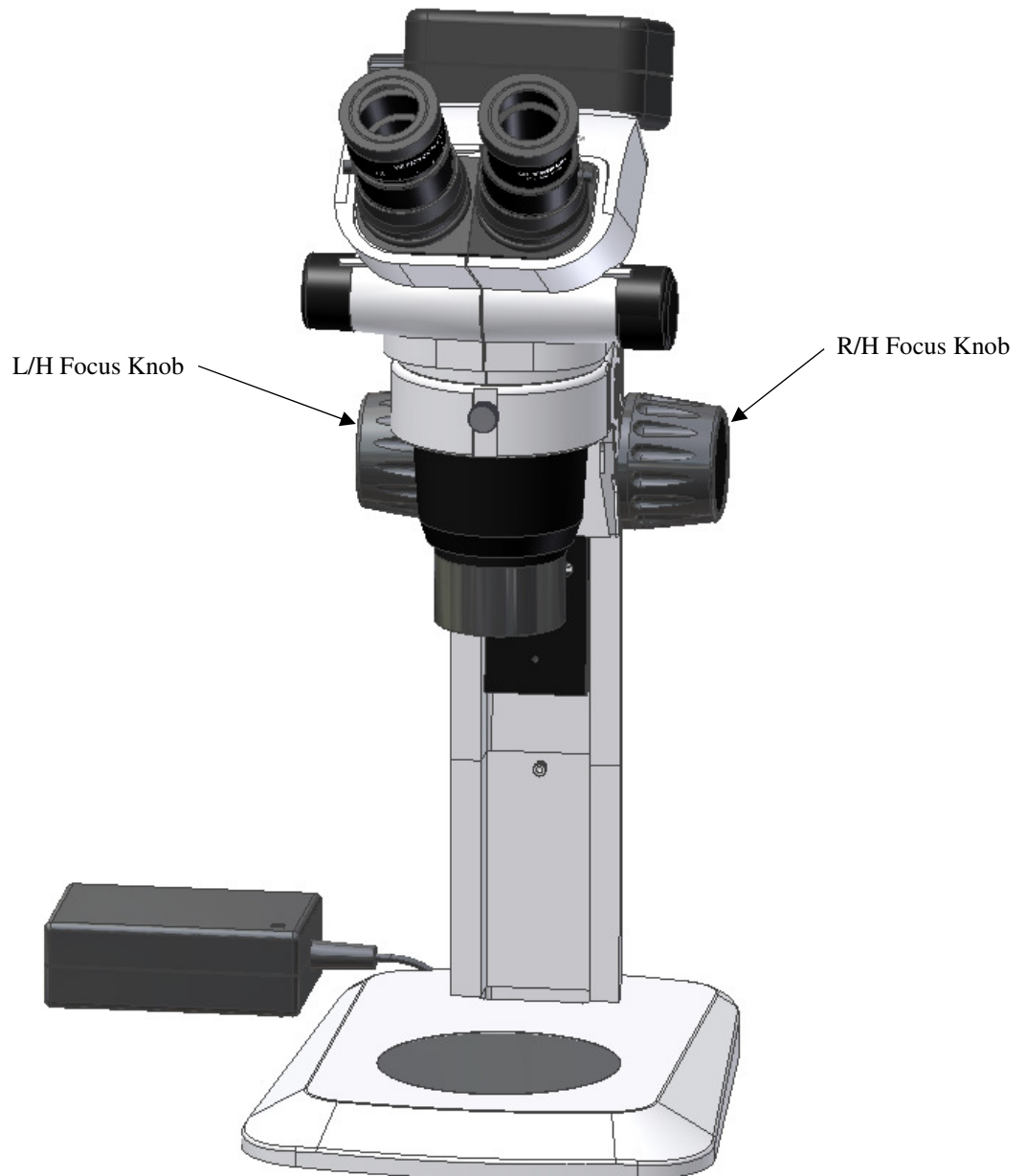


Adjusting focus friction

Over time, depending on the frequency of use, the focus friction may loosen, so that the microscope head starts to fall under its own weight. Conversely the focus knobs can be inadvertently tightened, so that they are difficult to turn.

To adjust the focus friction to a suitable level, while viewing the microscope from the front,

1. Hold the left hand side focus knob firmly
2. Rotate the right hand side focus knob clockwise to tighten the focus friction
3. Rotate the right hand side focus knob anti-clockwise to loosen the focus friction
4. Release the LHS knob and test the 'feel' of the focus system by rotating either the LHS or RHS knob on its own. The system should allow the microscope head to be focussed up or down easily without falling under its own weight.



TROUBLESHOOTING

SYMPTOM		FIRST STEP	REMEDY
VIEWING SYSTEM	The image is blurry	If the microscope or object has moved it may no longer be in focus.	Refocus the microscope.
		A different user may require adjustment for their refractive error.	Adjust the eyepieces for refractive error – refer <i>Focussing the microscope</i> .
		Check the eyepieces for cleanliness.	Carefully remove and clean the eyepieces if they are dirty, then replace them.
		Check the objective lens for cleanliness.	Carefully clean the objective lens, taking care not to damage the lamphouse prism.
	No image is seen	Check that the eyepieces have been inserted.	Insert the eyepieces.
		Check for obstructions in the viewing path	Remove the obstruction.
FOCUS SYSTEM	The focus system allows the microscope to fall under its own weight		Adjust the focus friction – refer <i>Advanced instructions</i>
	The focus system is too stiff	Check for obstructions	Adjust the focus friction – refer <i>Advanced instructions</i>

SYMPTOM		FIRST STEP	REMEDY
LIGHTING SYSTEM	The light is too dim	Check the intensity setting on the front panel. The intensity may be set low.	Increase the lamp intensity using the adjusting knob.
	There is no light	Check if there is mains power available	Switch to battery power if no mains power is available.
		Check the intensity setting on the front panel. The intensity may be set to zero.	Increase the lamp intensity using the adjusting knob.
		Check if the power supply cable is (firmly) connected to the socket on the lamphouse.	If not, connect it.
POWER SUPPLY	There is no power	Check the mains power supply	Use battery power if no mains power is available.
		Check the mains power supply cable is (firmly) connected to the IEC socket on the power supply.	If not, connect it..

SPECIFICATIONS

OPTICAL HEAD	
VIEWING SYSTEM	Binocular, stereoscopic (convergence angle 10°)
	Eyepiece tube inclination 45°
MAGNIFICATION	Zoom magnification, range 4.2 x - 25x
WORKING DISTANCE	Auxiliary objective to object distance 160 mm
FIELD OF VIEW	15 - 65mm, depending on magnification
REFRACTIVE ERROR	+/- 5D left eyepiece
FOCUSING	Range ± 55mm
INTERPUPILLARY DISTANCE	Adjustable for Distance PD range approximately 50 to 80mm
ILLUMINATION	
ALIGNMENT	Coaxial with viewing system, high intensity
LAMP	20W LED
FILTERS	Internal ultraviolet (435nm cutoff)
LAMP LIFE	Minimum 10 years
ILLUMINATION	50,000 Lux minimum.
POWER SUPPLY	
MAINS POWER	100-240V, 50-60Hz switch-mode auto selecting
OUTPUT	15V/2A Regulated output
EARTHING	Via earth lead of mains power cable (green/yellow)
CABLE: <i>Mains</i>	Length 5 metres

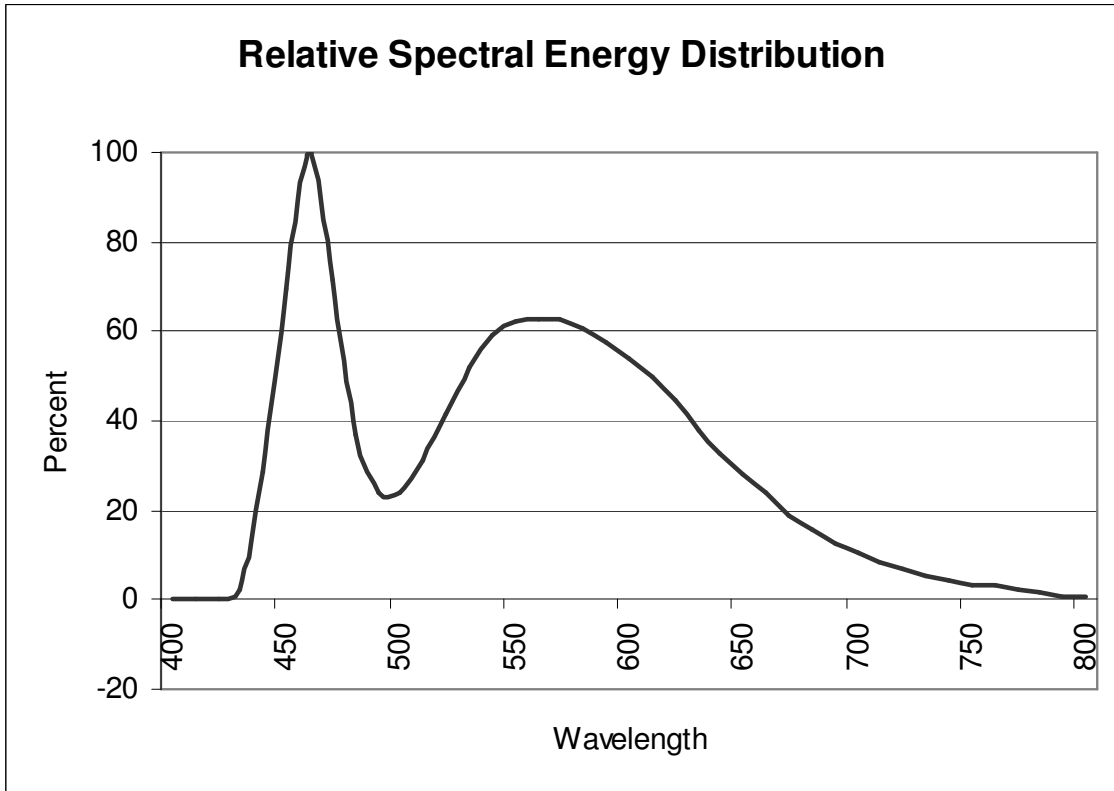


Figure 1: Spectral Energy Distribution