PriorLux™

PRIOR
Scientific

Advanced Laboratory Microscope

Operating Instructions

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1. Introduction

The PriorLux upright compound microscope is a high quality instrument equipped with infinity corrected optics for the best possible image quality along with maximum flexibility. The robust construction and hard wearing materials ensure long lasting and trouble free operation. The instrument can be used with a number of accessories allowing brightfield, dark ground, phase contrast and polarising contrast observations.

For documentation a trinocular head is available which permits mounting of a video or digital camera system.

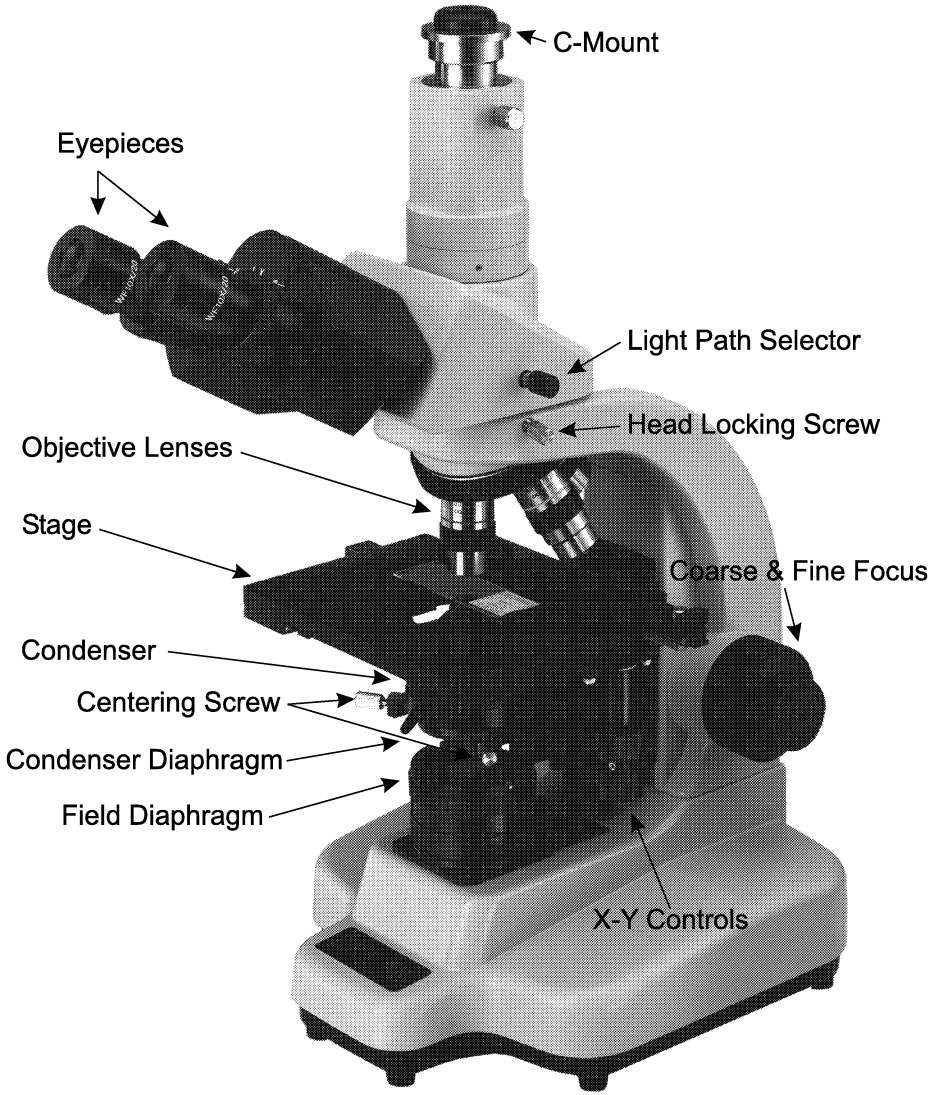
2. Specification

Mechanical Tube Length: ∞			
Objective Lenses			
Magnification	**N.A.**	**Cover Glass**	**Medium**
4 x	0.1	0.17mm	Air
10 x	0.25	0.17mm	Air
20 x	0.50	0.17mm	Air
40 x	0.65	0.17mm	Air
100 x	1.25	0.17mm	Oil

Eyepieces	
Magnification	**Field of View (mm)**
10x	20
12.5x	14

Components	
Condenser	1.25 N.A. Abbe Condenser
Stage	Mechanical x-y with 79mm(x) x 40mm(y) range
Focus	Co-axial coarse & fine with tension adjustment
Head	Binocular/Trinocular with 55-75mm interpupiliary distance adjustment.
Illumination	6V 20W Halogen, variable intensity
Power Supply	220/240 VAC 50 Hz or 110 VAC 60 Hz

3. Component Parts



4. Unpacking and Assembly

The PriorLux is shipped in protective bags within a pre-formed polystyrene box. Each component should be carefully unpacked and checked, cutting rather than tearing the plastic bags. The head (binocular or trinocular) should be fitted to the dovetail on top of the stand and locked in place with the head locking screw. The eyepieces then just drop into the eyepiece tubes at the front of the head, these should be pushed in as far as they will go.

Remove each objective lens from its protective "pot" and screw into the free positions on the nosepiece. Move the stage and the condenser carrier to the highest position and insert the condenser from underneath with the diaphragm control facing to the front. This is locked in position with the clamping screw, which is fitted from the side.

5. Electrical Connection and Safety

Stands are supplied with an operating voltage of either 220/240 VAC 50/60Hz or 110/120 VAC 50/60Hz. This voltage is marked on the base of the microscope at the rear. Before plugging in and switching on confirm that you have the correct stand for your local supply. The instrument is supplied with a power lead complete with appropriate plug for mains connection. UK plugs are fitted with a 3A fuse. This should only be replaced with a similarly rated fuse. The instrument should ALWAYS be switched off and isolated from the mains before any lamp or fuse is changed.

6. Setting Up

Connect the power cable to the base of the microscope, at the rear, and before switching on the power reduce the lamp intensity control to its minimum setting. After switching on, the intensity should be increased to a comfortable level. This procedure should be reversed before switching off. Following this method will considerably prolong the life of the bulb.

Binocular/Trinocular Head

Interpupiliary distance should be set by moving the eyepieces in an arc until the two images coincide and the view is perfectly circular to both eyes. Note the value on the scale between the eyepieces so that the position can quickly be regained for future viewing. Place a specimen on the stage and focus looking through only the right eyepiece. When the specimen is in focus close the right eye and adjust the dioptre on the left eyepiece so that the image is perfectly focused. The instrument is now balanced for your eyes.

7. Setting Köhler Illumination

A. Follow the procedure in section 6 to set up the instrument for your eyesight.

B. With a specimen in sharp focus using the 10x objective, close the field diaphragm until it impinges on the field of view, Figure 1, Picture A.

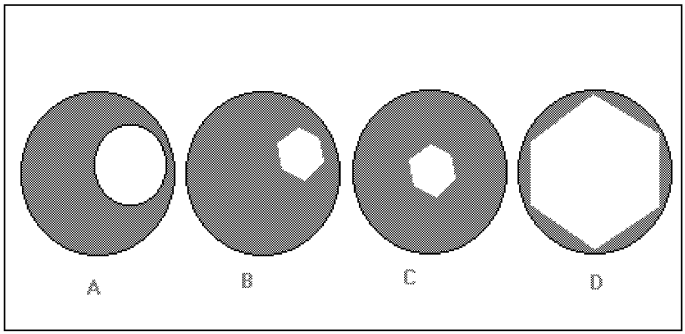


Figure 1

C. Focus the condenser using the side mounted rack and pinion controls until the leaves of the diaphragm are in sharp focus, Figure 1, Picture B.

D. Using the condenser centration controls move the diaphragm into the centre of the field of view, it may help to open it until it is nearly touching the outside of the field to attain perfect centration, Figure 1, Pictures C & D.

E. Fully open the field diaphragm.

F. Fully open the condenser diaphragm and then slowly close it until you see the contrast within the image increase. If you then remove an eyepiece and look directly down the tube from a distance of 20-30cm you should see an image similar to picture D in Figure 1. The aim here is to have the "bright" area occupying approximately 70% of the total field. The amount it occupies will change dependant on the objective lens in use. If you have set up the instrument using the 10x objective (recommended) then as you increase the magnification this diaphragm will need opening to optimise the contrast and resolution. Often it is set for the objective which is either most frequently used or most critical in terms of resolution and left in that position.

8. Cleaning Objectives

It is critical that the front lens of each objective is kept clean and free of contamination. Any dust or dried immersion oil will seriously affect the image quality attainable with that objective. If contamination is suspected then the easiest way to confirm this is by removing the objective lens and examining the front lens using the eyepiece. To do this take out one of the eyepieces, turn it around so that you are looking the wrong way through it and move it towards the front of the objective until you can focus on the front lens. This will clearly show any contamination. To remove dirt and oil a lens cloth, lens tissue or cotton bud dampened with industrial alcohol can be used. A spiral motion starting from the centre of the lens moving to the outside is the best way of achieving a thoroughly clean surface.

9. Phase Contrast

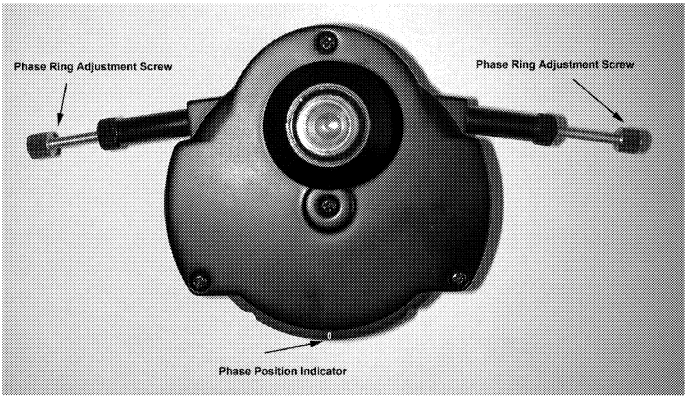


Figure 2

Phase contrast is a technique used to amplify contrast in unstained samples. To be able to see objects with phase contrast the optional phase kit is required. This includes a phase turret condenser (see figure 2), phase objectives, a centering telescope and a green filter. Firstly the standard condenser must be removed by loosening the retaining screw and the phase turret condenser installed in its place. Swap the standard objectives (if you have them) for phase contrast objectives, these are engraved PH, and select the correct condenser position (0 for brightfield, 10 for the 10x objective, 20 for the 20x objective etc.) Follow the steps in section 7 to ensure that Köhler illumination is set up properly. Remove an eyepiece and insert the centering telescope, this allows you to focus on the phase rings and make adjustments to their alignment. The two rings, one bright, one dark should overlap perfectly (A), if not (B) then their position relative to one another should be adjusted using the centration screws at the rear of the condenser (Figure 3).

To make adjustments to the phase ring alignment push in the adjustment screws and then turn. When the alignment is complete remember to pull the screws back out or it will be impossible to change condenser position.

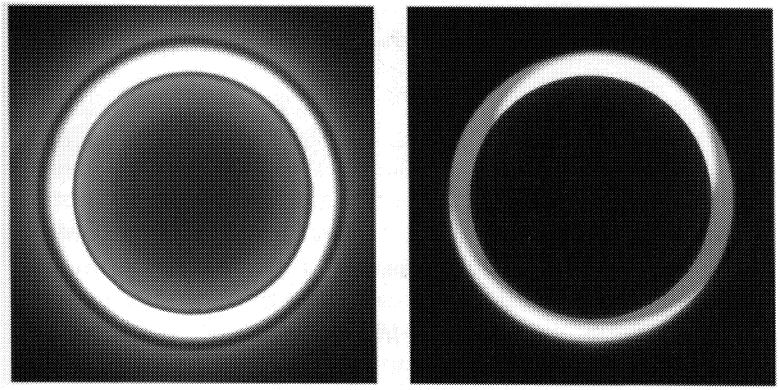


Figure 3

This procedure needs to be carried out for every objective, but unless deliberately adjusted should not need checking again frequently. If the quality of the phase contrast image is poor then check that the condenser is properly focused and centred and then ensure that the rings are correctly aligned.

10. Dark Ground

The microscope may be used for dark ground observations if the optional condenser has been purchased. To use dark ground simply exchange the condenser (brightfield or phase contrast) for the dark ground condenser and bring it up until it nearly touches the slide from underneath.

11. Photomicrography

The PriorLux microscope is designed to be used, with the addition of a Trinocular head, for photomicrography with either a video (CCTV) or digital camera system. The Trinocular head is supplied with a c-mount adapter suitable for mounting either of these options, although if a digital camera, such as the Nikon Coolpix 4500 is used an intermediate adapter is also required. The camera should simply screw onto the c-mount adapter. By pulling out the light path selector 80% of the light is diverted up to the camera and this image can either be displayed directly on a monitor, via a frame grabber onto a PC or captured using a digital camera. For more detailed set up information refer to the literature supplied with the camera.

12. Bulb Replacement

Halogen bulbs have a finite life and will need replacing from time to time. Replacement bulbs, part number W1052, are available from Prior Scientific. To change the bulb switch off the PriorLux and isolate from the mains supply by removing the power cable. Turn the instrument onto its side and access the bulb by pulling the lamp cover-clamping knob away from the base of the microscope. Remove the old bulb and, without touching the glass, replace it with a new one. Close the cover, re-connect to the mains and switch on the instrument.

CERTIFICATE NO: FM 61600
STANDARD: BS EN ISO 9001:2000

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