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Vision
ENGINEERING



L Y N X[®]

User Guide

Lynx Stereo Dynascopic Microscope

Lynx stereo dynascopic microscope

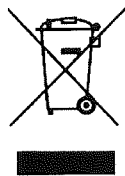
Vision Engineering manufacture a wide range of patented optical systems, offering fatigue-free viewing with superb hand/eye co-ordination, for improved quality and productivity.

The Lynx stereo microscope utilises Vision Engineering's patented Dynascope technology, offering the user advanced ergonomics by removing the need for restrictive eyepieces.

The eyepieceless optics of Lynx significantly increase head freedom and eye relief, reducing operator stress and fatigue over long periods of time.

Lynx is used in a wide range of industry applications including general manufacturing, medical devices, electronics, precision engineering, plastics and rubber. The multiple accessories available for the Lynx enable a wide variety of tasks including inspection, manipulation, assembly, dissection, soldering, polishing, finishing and measurement.

Health & Safety



Vision Engineering and its products conforms to the requirements of the EC Directives on Waste Electrical and Electronic Equipment (WEEE) and Restriction of Hazardous Substances (RoHS).

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OTHER SOLUTIONS FROM VISION ENGINEERING

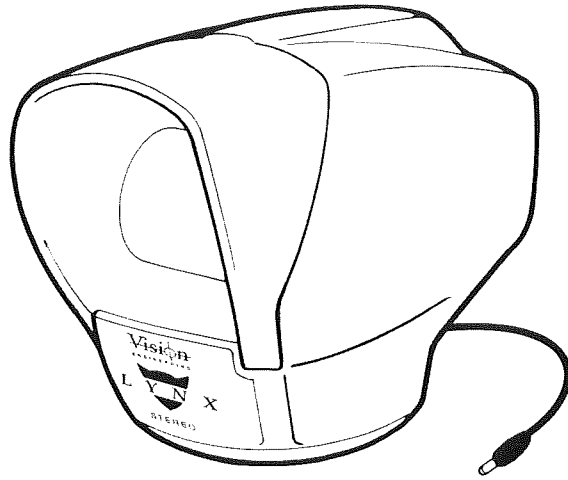
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SERVICE RECORD

WARRANTY

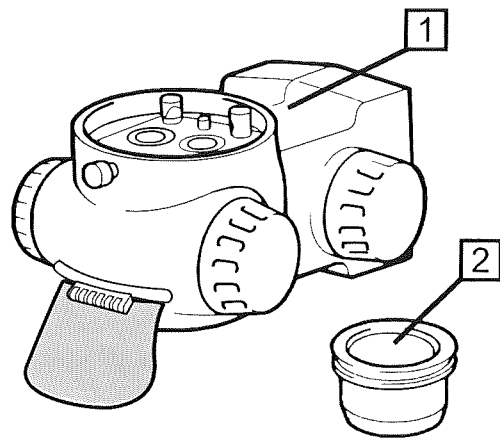
Head assembly

The head pack contains the Lynx viewing head.



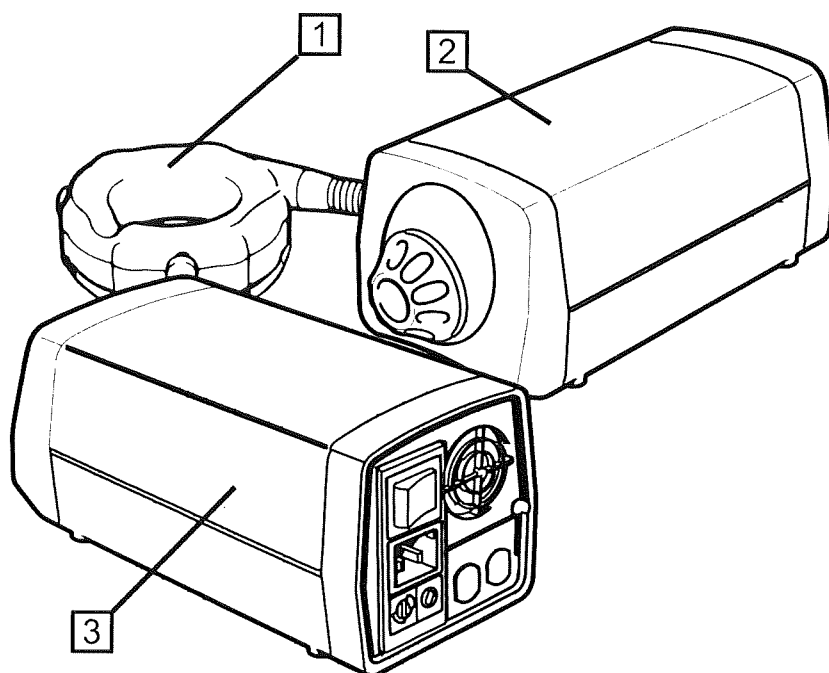
Zoom/focus assembly

- 1 Zoom/focus assembly
- 2 Objective



Illumination assembly

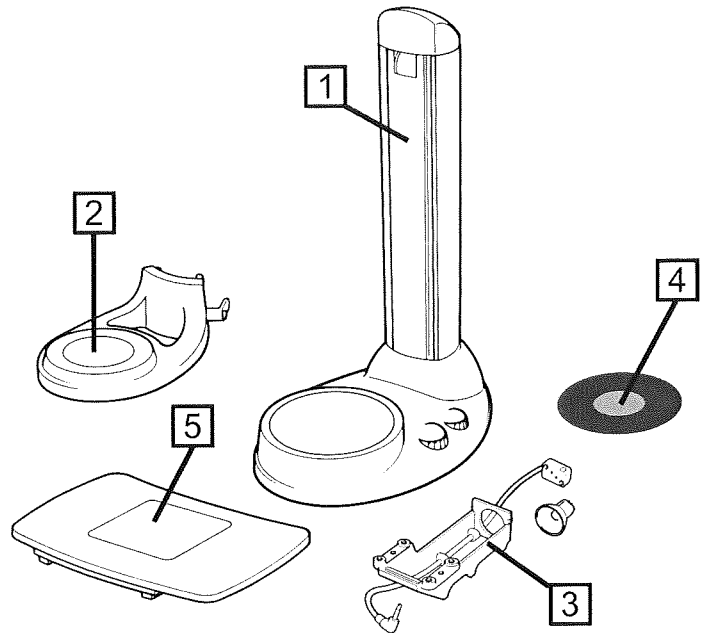
- 1 Ringlight
- 2 Illuminator
- 3 Power supply



Stand assembly

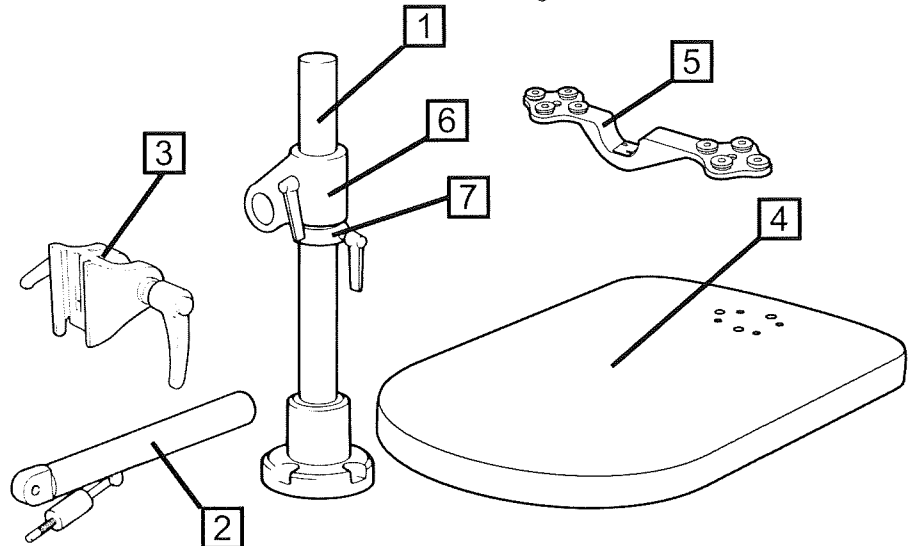
Bench stand

- 1 Column and stand
- 2 Adjustable subject platform
- 3 Substage illuminator (optional)
- 4 Condenser assembly with diffuser (optional)
- 5 Floating stage (optional)



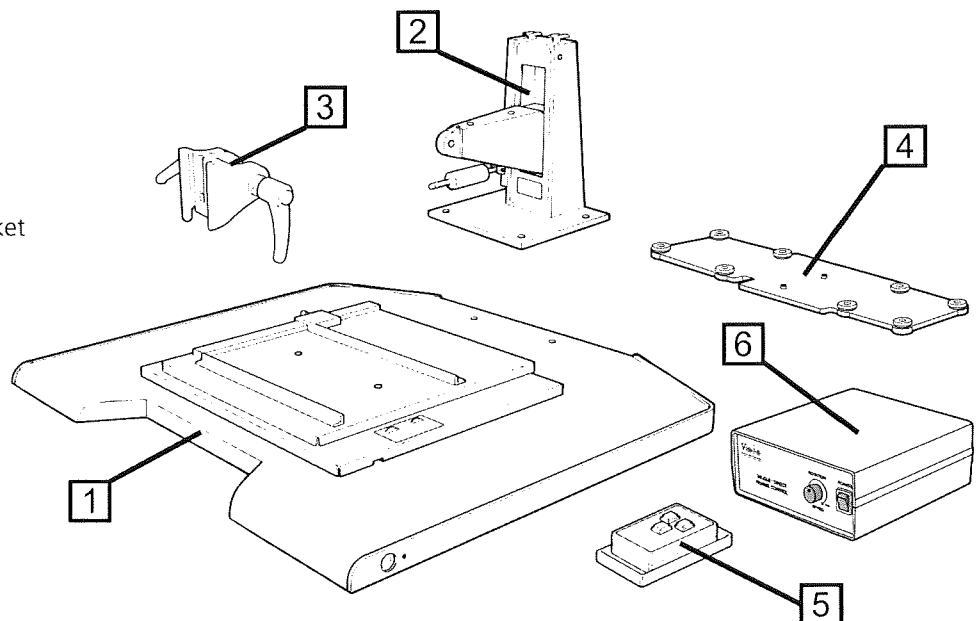
Boom mount

- 1 Upright boom bar
- 2 Horizontal boom bar
- 3 Boom mount bracket
- 4 Platform (optional)
- 5 Illuminator shelf
- 6 Support collar
- 7 Securing collar



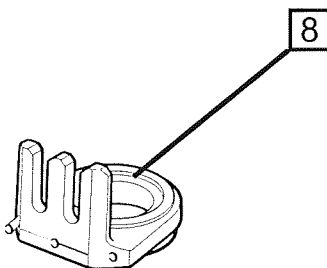
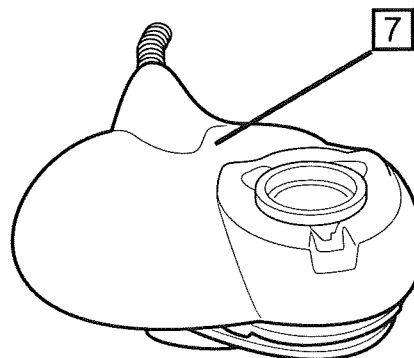
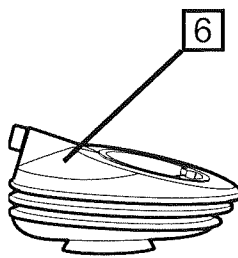
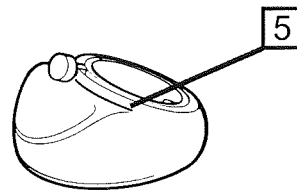
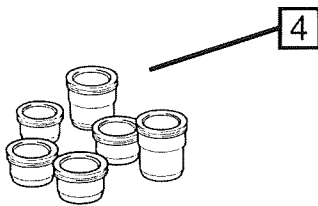
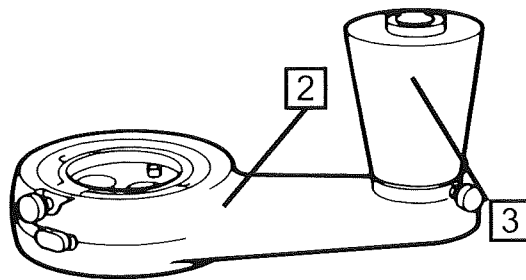
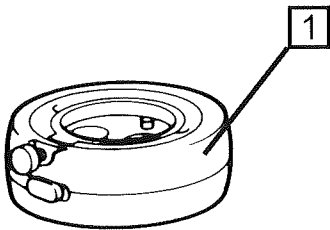
VS8

- 1 Platform
- 2 Column
- 3 Column mounting bracket
- 4 Illuminator shelf
- 5 Motorised controls for oblique and direct viewer (optional)
- 6 Power and speed control for oblique and direct viewer (optional)



Accessories

- 1 Zoom multiplier
- 2 Photo arm
- 3 Photographic adapter (various)
- 4 Objectives (various)
- 5 Fixed angle viewer
- 6 Ergowedge angle adapter
- 7 Oblique and direct viewer (manual or motorised)
- 8 Graticule



Bench stand

Substage illuminator (optional)

- ▶ Remove the protective film from the mirror ①.

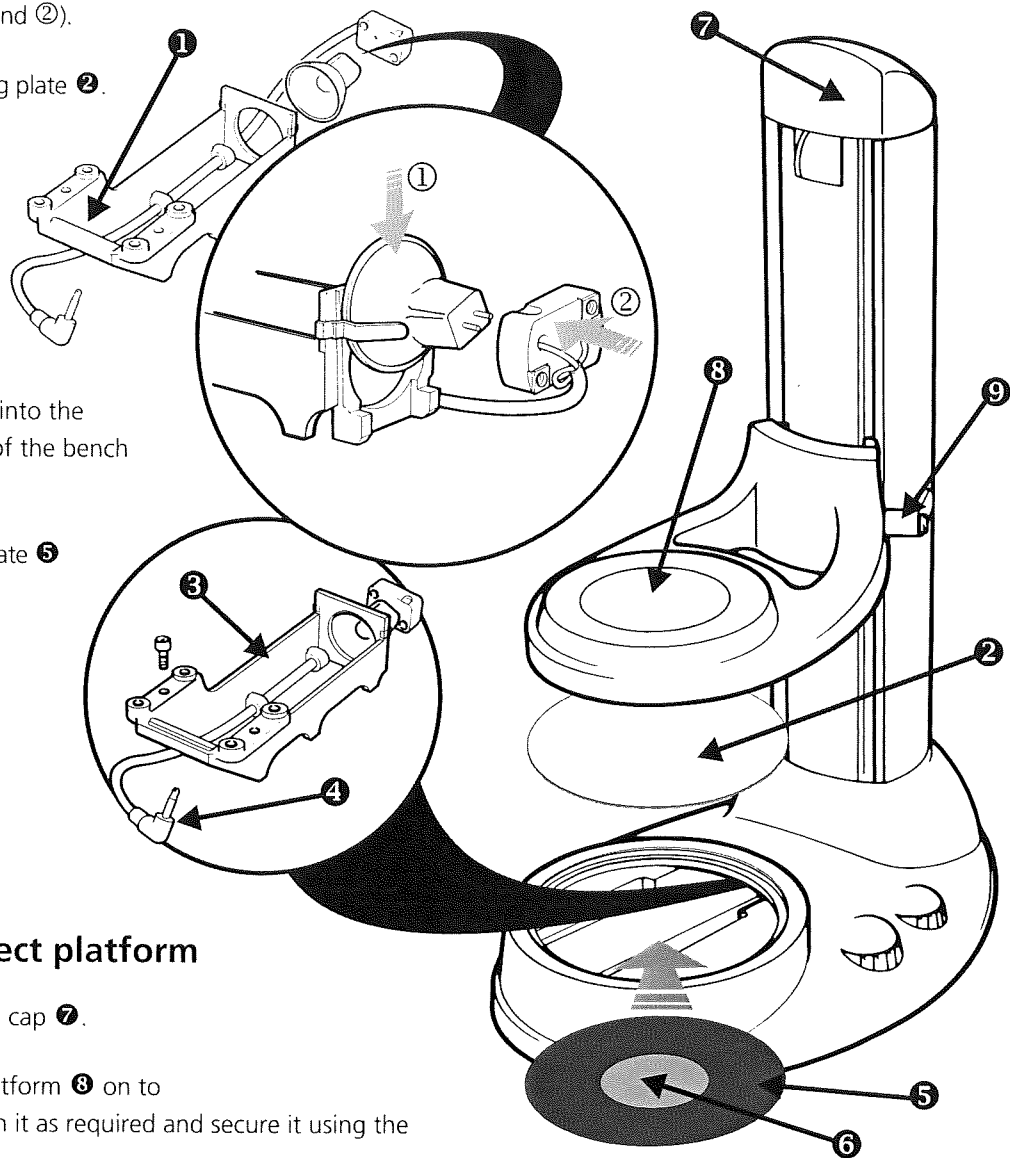
- ▶ Fit the bulb (see ① and ②).

- ▶ Remove the blanking plate ②.

- ▶ Slide the substage illuminator ③ into position and secure it with the two bolts supplied.

- ▶ Connect the assembly's plug ④ into the socket in the base of the bench stand.

- ▶ Put the condenser plate ⑤ into position and fit the diffuser ⑥ in either the base or subject platform (see below) as required.



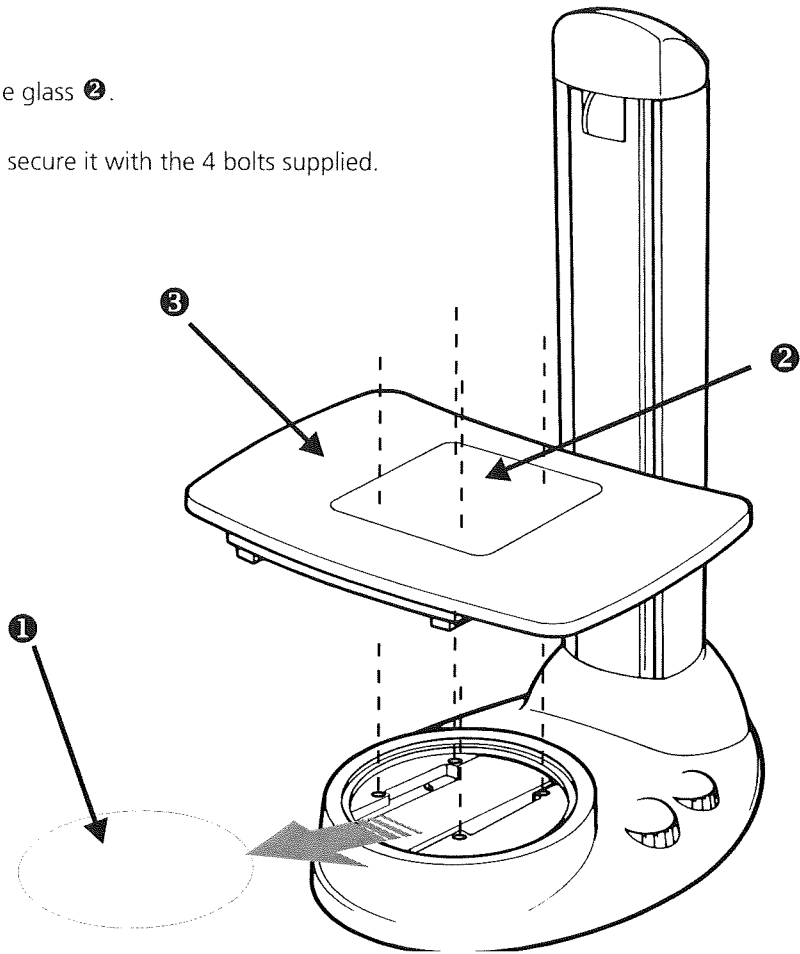
Adjustable subject platform

- ▶ Remove the column cap ⑦.

- ▶ Slide the subject platform ⑧ on to the column, position it as required and secure it using the clamp ⑨.

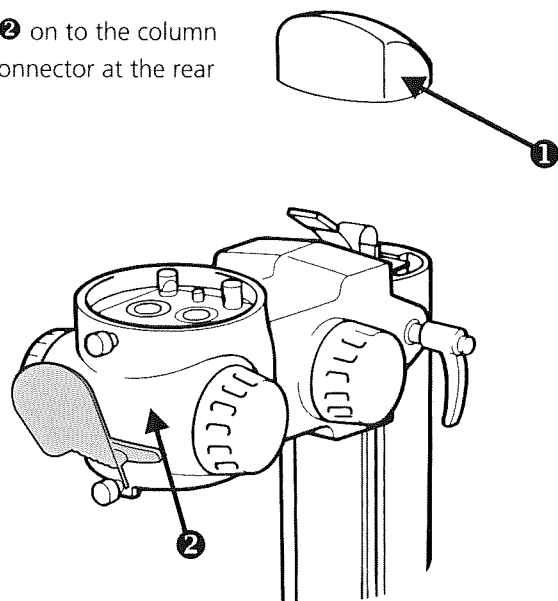
Floating stage (optional)

- ▶ Remove the blanking plate ① and stage glass ②.
- ▶ Lower the stage ③ onto the stand and secure it with the 4 bolts supplied.
- ▶ Replace the stage glass.



Zoom/focus assembly

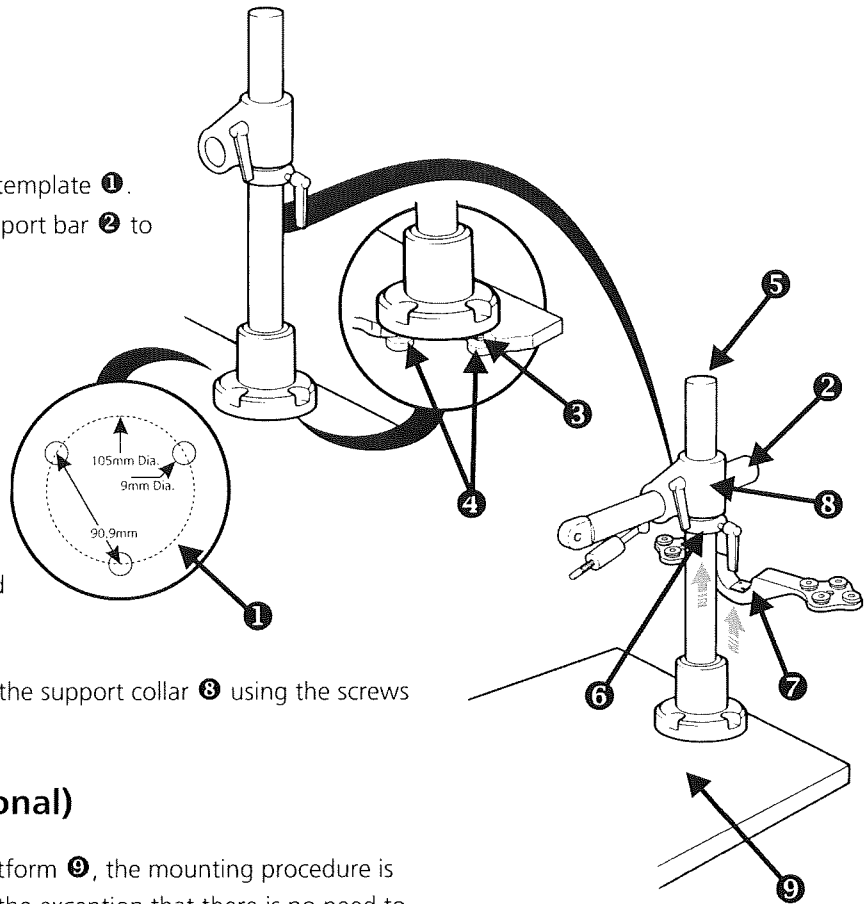
- ▶ Remove the column cap ①. Slide the zoom/focus assembly ② on to the column to allow the column connector to be attached to the male connector at the rear of the assembly.
- ▶ Position the zoom/focus assembly as required and secure it.
- ▶ Replace the column cap.



Boom mount

Work surface mounting

- ▶ Drill holes in the bench using the template **1**. Allow room for the horizontal support bar **2** to protrude behind the Lynx.
- ▶ Feed the stand securing bolts **3** up through the pressure cups **4** and secure into the stand base.
- ▶ Attach the horizontal support bar to the vertical bar **5**.
- ▶ Slide the securing collar **6** up and lock it in the desired position.
- ▶ Attach the illuminator shelf **7** to the support collar **8** using the screws and Allen key provided.

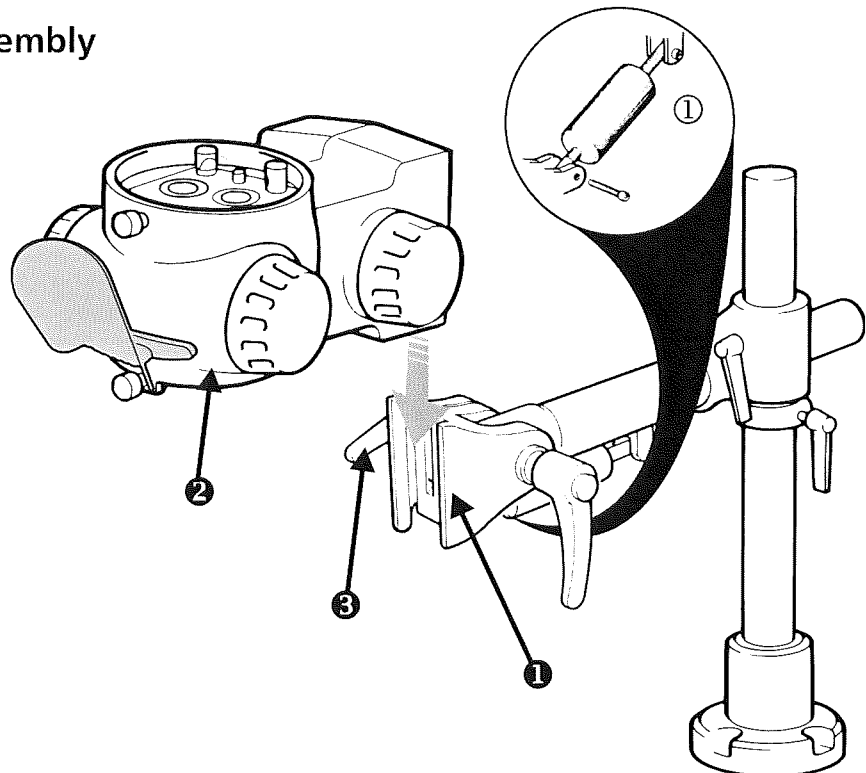


Platform mounting (optional)

If you have purchased the optional platform **9**, the mounting procedure is identical to that described above with the exception that there is no need to drill the mounting holes as the platform comes pre-drilled.

Boom mount bracket assembly

- ▶ Attach the boom mount bracket **1** to the horizontal post (see inset **1**).
- ▶ Slide the zoom/focus assembly **2** on to the interface and tighten its securing clamp **3**.

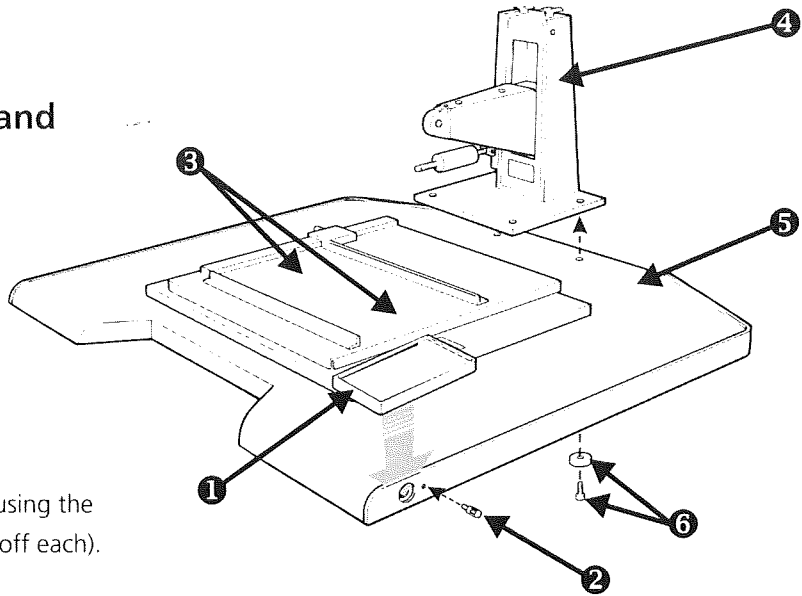


VS8

Motor controller tray and stand

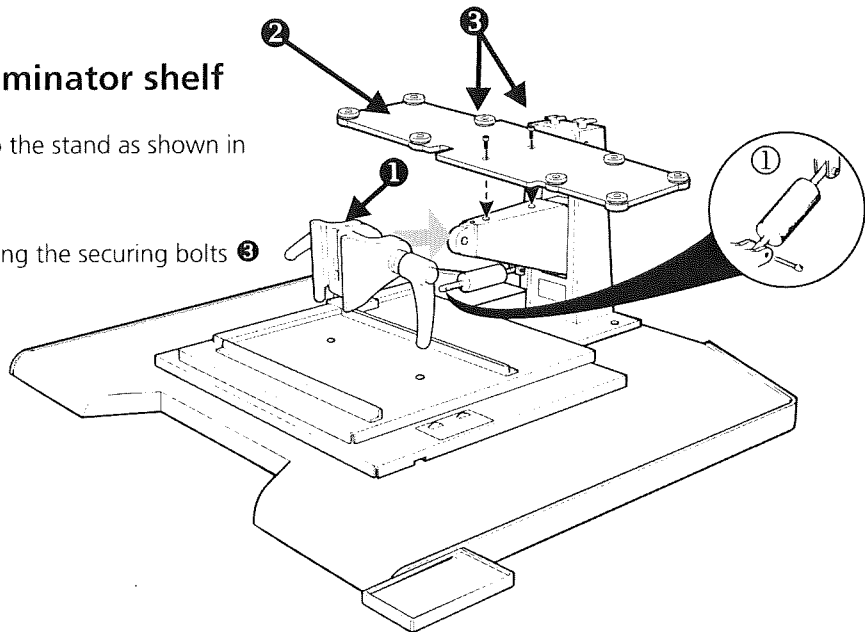
The motor controller tray is for use with the optional oblique and direct viewer.

- ▶ Attach the optional motor controller tray **1** and secure it with the screw **2** supplied.
- ▶ Remove the transit screws **3**.
- ▶ Attach the column **4** to the stand **5** using the securing bolts and pressure cups **6** (4 off each).



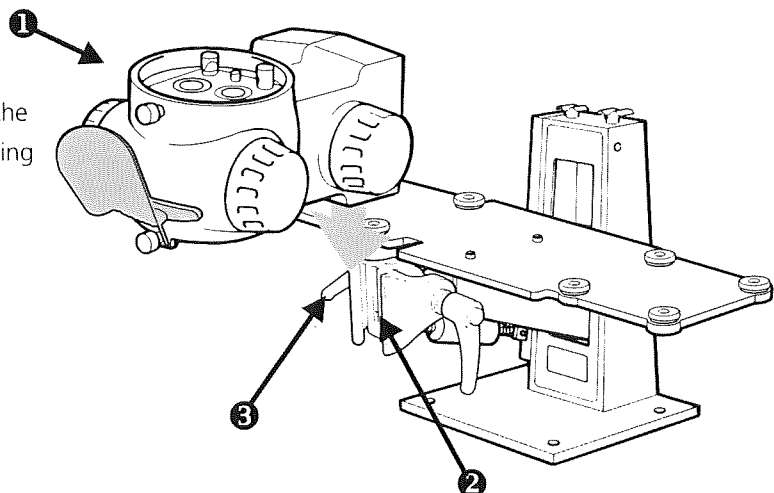
Interface bracket and illuminator shelf

- ▶ Attach the interface bracket **1** to the stand as shown in inset **1**.
- ▶ Attach the illuminator shelf **2** using the securing bolts **3** supplied.



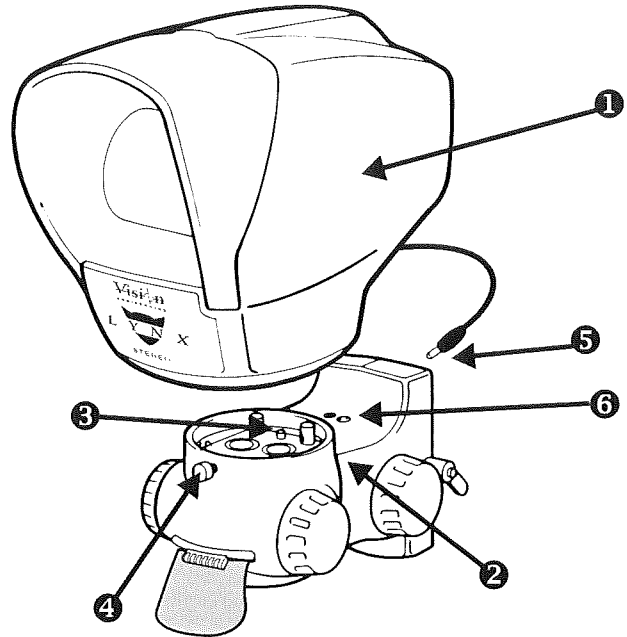
Zoom/focus assembly

- ▶ Slide the zoom/focus assembly **1** on to the interface bracket **2** and tighten its securing clamp **3**.



Head

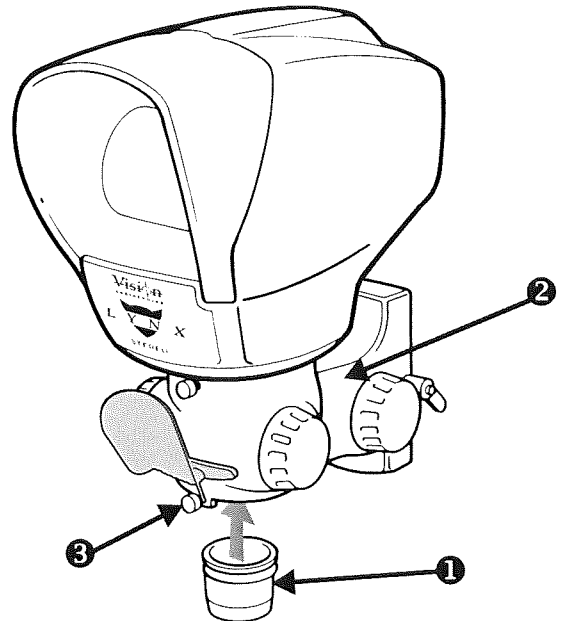
- ▶ Place the head ① on to the zoom/focus assembly ②, ensuring the alignment pin ③ in the zoom/focus assembly lines up with the relevant slot in the head. Tighten the securing screw ④.
- ▶ Insert the head connector ⑤ into the head socket ⑥.



Objective lens

- ▶ Position the objective lens ① up into the zoom/focus assembly ② and tighten the securing screw ③ to lock it into place.

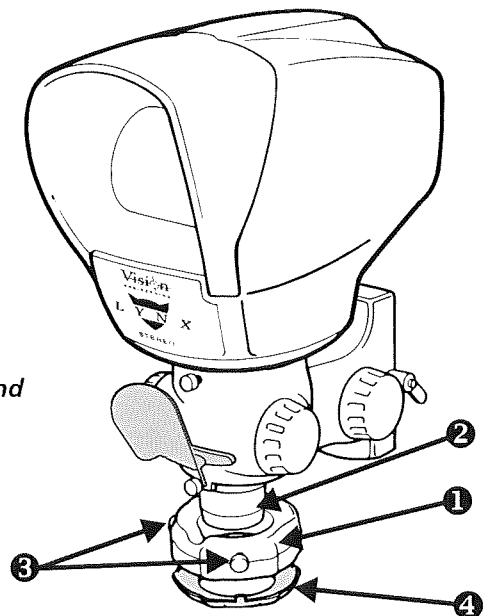
Note: For the equivalent procedure for the VS8, see oblique and direct viewer on page 11.



Ringlight

- ▶ Place the ringlight ① into position over the objective lens ② and tighten the securing screws ③.
- ▶ Attach the ringlight's fibre optic cable to the illuminator (see **Attaching the fibre optic cable** on page 9).
- ▶ Clip the beam converger ④ into place (only required if using x1.5 or x2 magnifying lenses, or x0.3 or x0.5 reducing lenses).

Note: For the equivalent procedure for the VS8, see oblique and direct viewer on page 11.

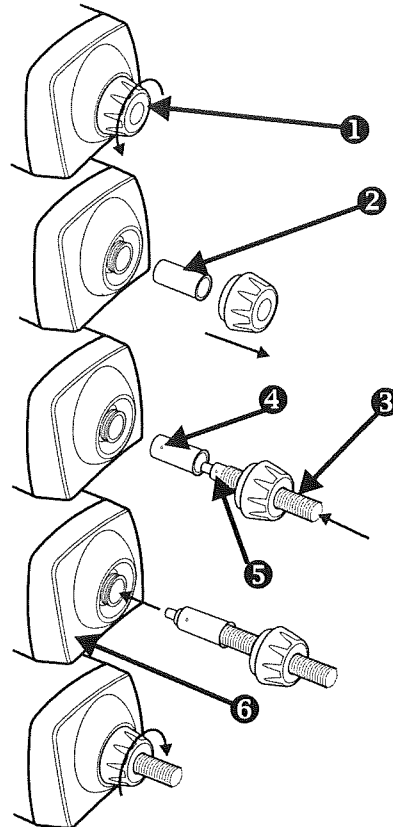


Cable connection

Attaching the fibre optic cable

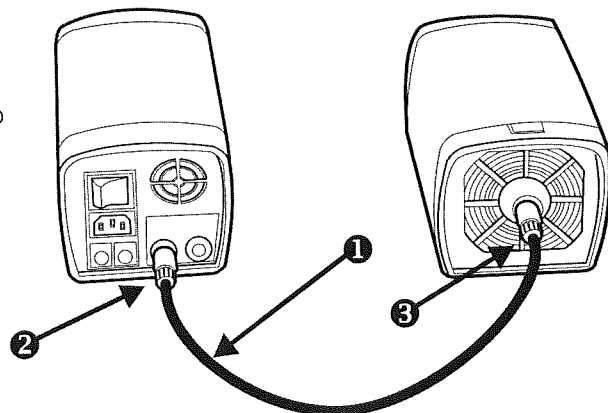
- ▶ Unscrew the locking collar ①.
- ▶ Remove the locking collar and ferrule ②.
- ▶ Insert the fibre-optic cable ③ through the locking collar and ferrule.
- ▶ Align the grub screw ④ with the indent ⑤ on the cable and tighten the screw with the Allen key provided (taped to the base of the illuminator ⑥).
- ▶ Insert the cable and ferrule into the illuminator.
- ▶ Tighten the locking collar.

Warning: *The fibre optic cable gets hot during use.
Do not attempt to disconnect it until it is cool.*



Illuminator power cable

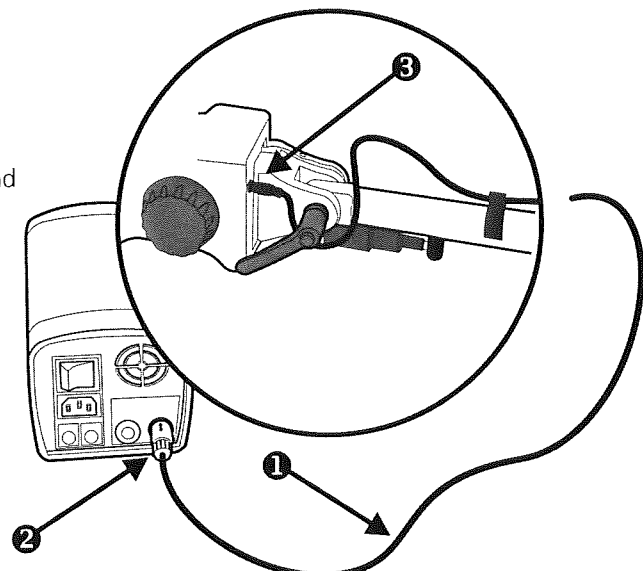
- ▶ Connect the illuminator power cable ① from the lamp connector ② on the power supply to the illuminator's power input connector ③.



Zoom/focus assembly power cable

Note: *This procedure is for the boom stand only.*

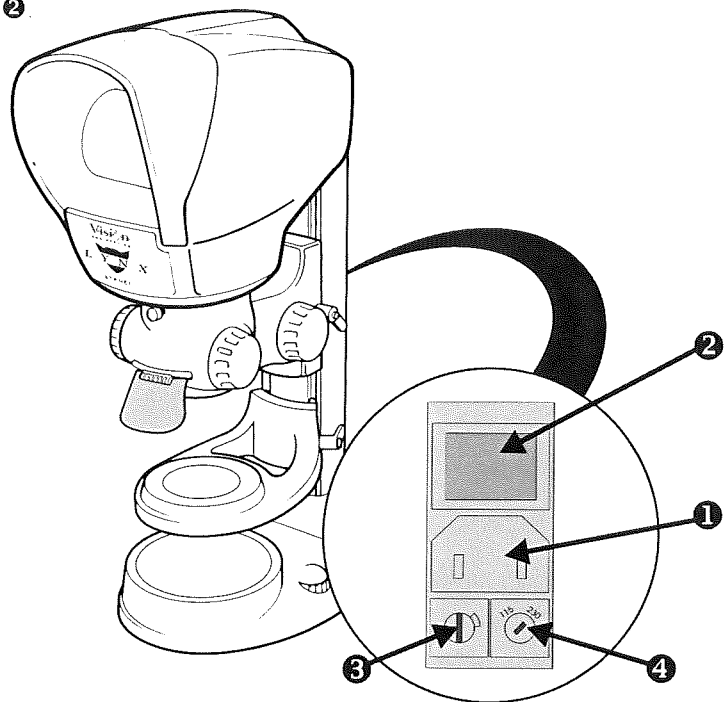
- ▶ Connect the zoom/focus power cable ① from the head connector ② on the power supply to the zoom/focus power input connector ③.



Mains connection bench stand

The mains input connector is located on the rear of the bench stand and is comprised of the input socket ①, on/off switch ②, fuse ③ and input voltage selector ④.

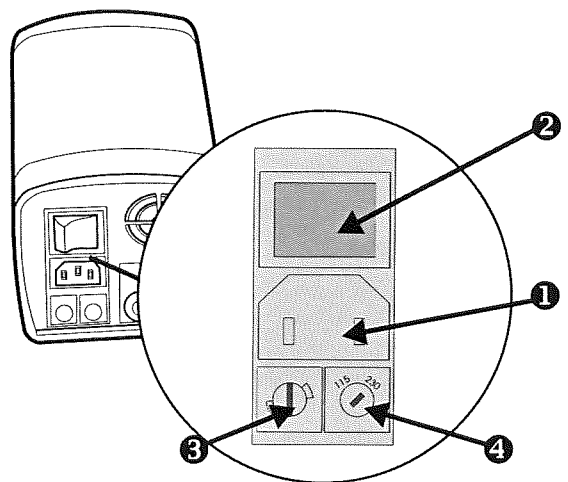
Note: *Ensure the input voltage selector is set to the correct mains supply voltage.*



Mains connection boom mount & VS8

The mains input connector is located on the rear of the power supply unit and is comprised of the input socket ①, on/off switch ②, fuse ③ and input voltage selector ④.

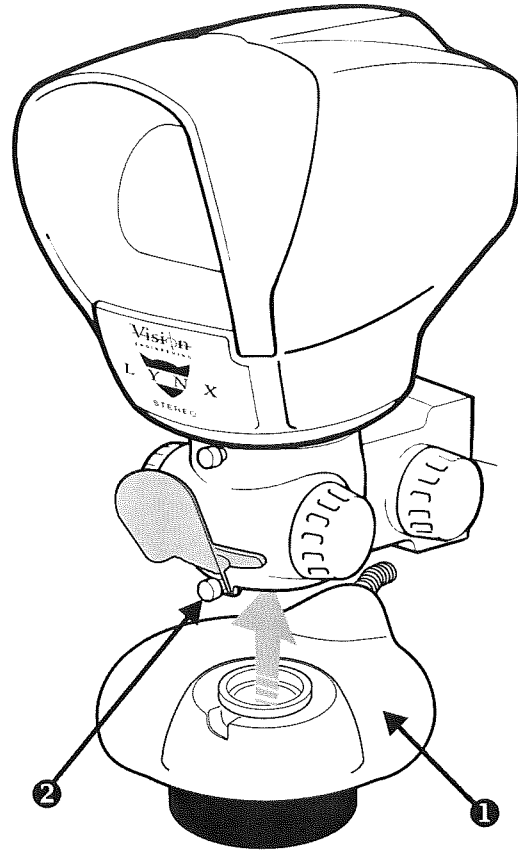
Note: *Ensure the Input voltage selector is set to the correct mains supply voltage.*



Oblique and direct viewer

Note: *The oblique and direct viewer includes an integrated objective lens and ringlight.*

- ▶ Place the oblique and direct viewer ❶ into position and tighten the securing screws ❷.
- ▶ Attach the viewer's fibre optic cable to the illuminator (see **Attaching the fibre optic cable** on page 9).



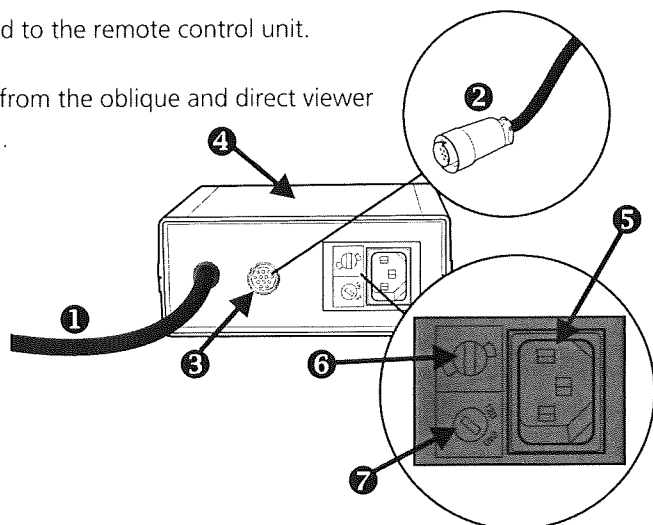
Manual oblique and direct viewer operation

The direct and oblique viewer can be switched between direct and oblique view by swivelling the viewer into the designed position. Once in position, the oblique viewer can be manually rotated by turning the knurled ring on the viewer to provide a rotated oblique view of the subject.

Note: *See oblique viewer operating techniques on page 12.*

Motorised oblique and direct viewer connection

- ▶ The remote control cable ❶ is permanently connected to the remote control unit.
- ▶ Connect the power supply and control connector ❷ from the oblique and direct viewer to the connector ❸ on the rear of the control box ❹.
- ▶ The mains connector is located on the rear of the control box and is comprised of the input socket ❺, fuse ❻ and input voltage selector ❼.



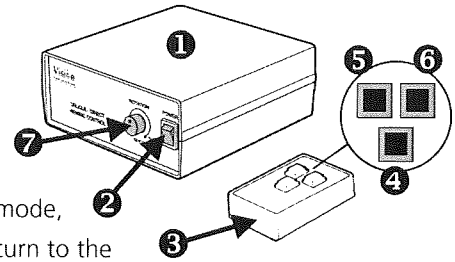
Note: *Ensure the Input voltage selector is set to the correct mains supply voltage.*

Motorised oblique and direct viewer operation

An oblique/direct view control box ① is included that must be turned "On" (via the front panel switch ② on the control box) to power the drive motors.

Also included with this viewer is a wired remote control ③ for switching between the normal and oblique views and for rotating the oblique view.

There are three buttons on the remote control: when viewing in the normal mode, button ④ will bring the oblique viewer into position (pressing it again will return to the normal, top down view), in the oblique mode, button ⑤ will rotate the view clockwise and the button ⑥ will rotate the view counter-clockwise. The view can be endlessly rotated in either direction. A speed control ⑦ on the oblique and direct view control box adjusts the rotational speed of the oblique view. Rotate the control clockwise to increase the rotational speed.



Oblique viewer operating techniques

When properly set up, and when viewing in the oblique mode, the centre of the image should be sharply in focus. The fringes of the field of view will not be as sharp as the centre due to the angle of the optical paths. At the lowest magnification settings, it is normal to have a dark area at the edge of the field of view. This is also due to the angle of the optical paths and diminishes as the zoom magnification is brought up from its minimum.

Procedure:

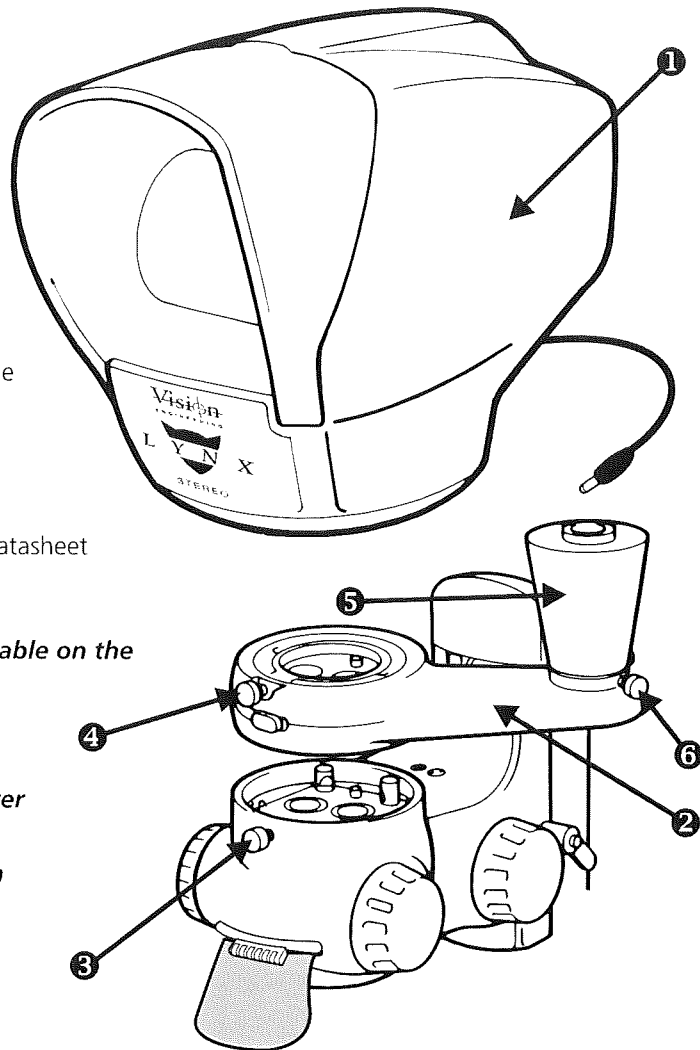
- ▶ Swing the viewer to the direct view position.
- ▶ Rotate the zoom knob fully clockwise to adjust for maximum magnification.
- ▶ Adjust the focus knob as required to get a sharp image of the subject. The system is now parfocal. The zoom magnification can be adjusted to any position and the image will stay clearly in focus.
- ▶ Swing the viewer to the oblique viewing position. The centre of the image will be in focus on the subject.
- ▶ To view a section of the subject that is not in focus, move the subject into the focussed area. Do not adjust the focus knob on the zoom body.
- ▶ The oblique and direct viewer is now set up and ready for use.

Photo arm

- ▶ Remove the head ①. Place the photo arm ② into position and tighten the securing screw ③.
- ▶ Replace the head on to the assembly and tighten the head securing screw ④.
- ▶ Attach the appropriate camera adapter ⑤ to the photo arm and tighten the securing screws ⑥.
- ▶ The camera attaches to the interface.
- ▶ Set up the camera interface as detailed in the datasheet provided.

Note: *There are many digital cameras available on the market. In order for a digital camera to interface to your Lynx, it must have a C-Mount interface. Contact Vision Engineering to see if an adapter is available. Cameras and video equipment purchased through Vision Engineering have been tested for compatibility.*

Note: *Adapters for USB, digital and 35mm SLR cameras are different.*

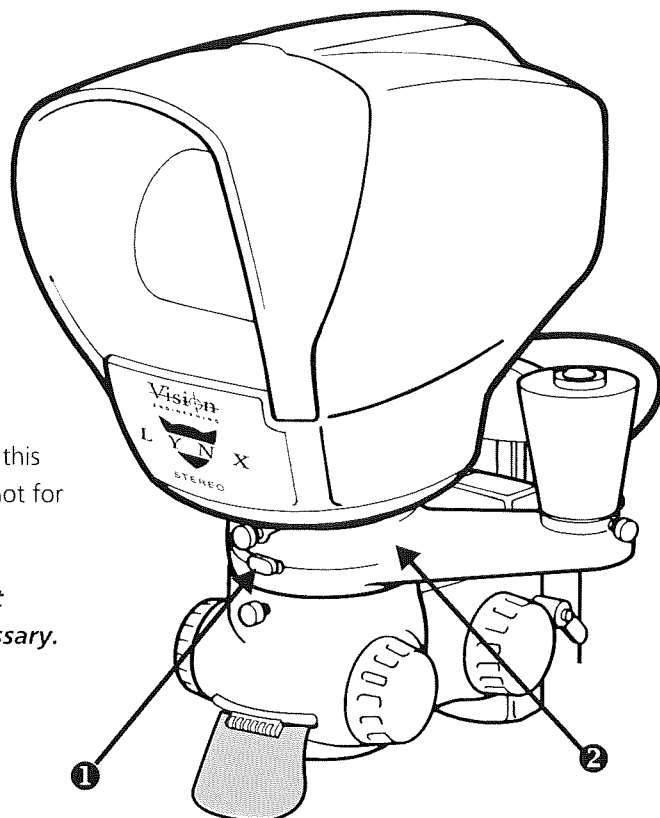


Operation

The photo arm is the first component to be installed, regardless of camera type. It mounts between the zoom body and the Dynascope head (see above).

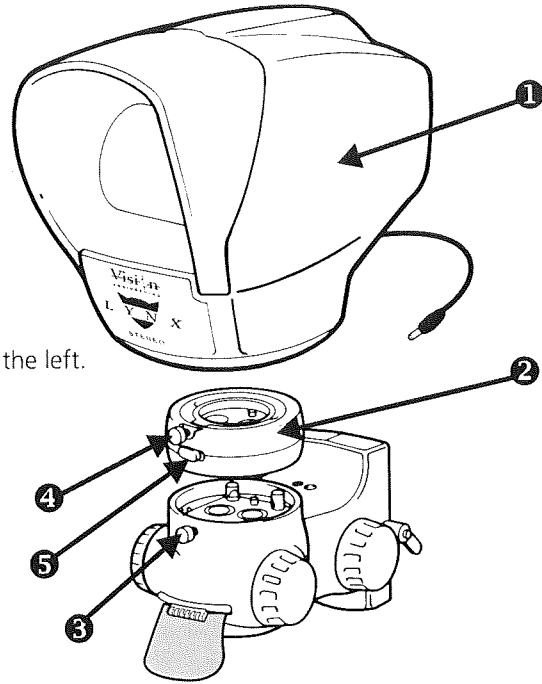
- ▶ To see the image through the camera, slide the lever ① on the camera arm ② all the way to the left. This will re-direct the right-hand optical path to the camera and eliminate that path from the viewing screen, thereby yielding a mono image. For this reason engage the camera only when needed and not for normal stereo viewing.

Note: *Refer to the camera and adapter product datasheets for more information if necessary.*



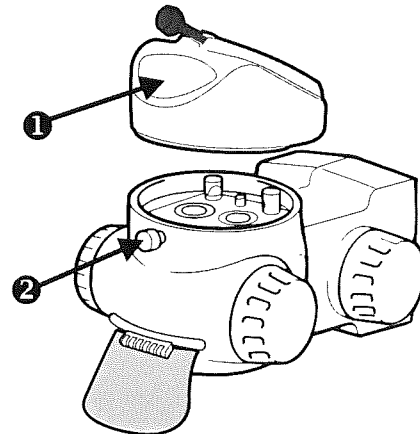
Zoom multiplier

- ▶ Remove the head **1**. Place the zoom multiplier assembly **2** into position and tighten the securing screw **3**.
- ▶ Replace the head on to the assembly and tighten the head securing screw **4**.
- ▶ To engage the multiplier, slide its lever **5** all the way to the left.

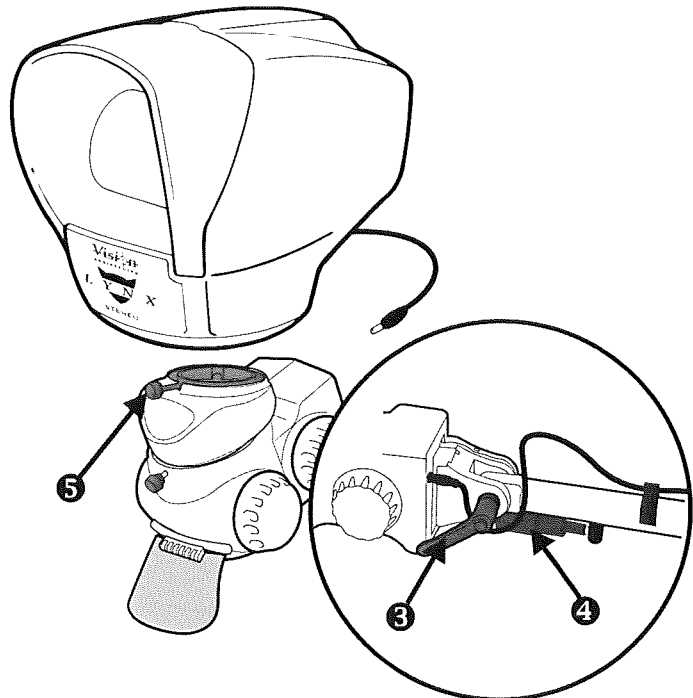


Fixed angle viewer (boom mount only)

- ▶ Remove the head. Place the fixed angle viewer **1** into position and tighten the securing screw **2**.

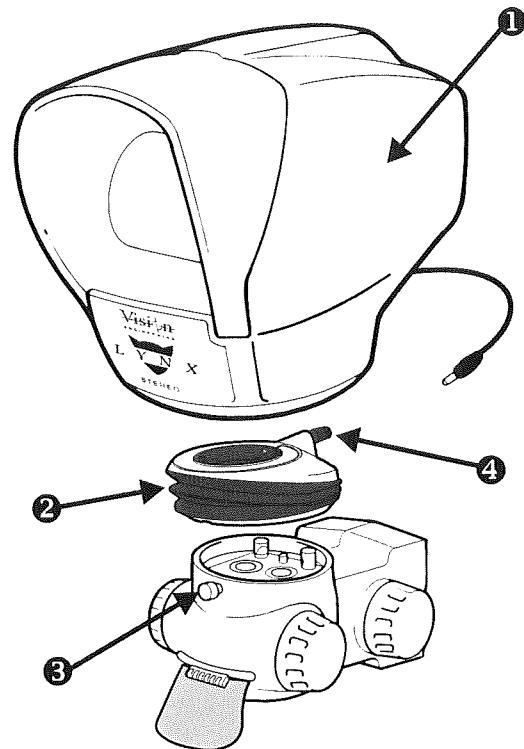


- ▶ Loosen the securing clamp **3** and turn the knurled tilt adjustment knob **4** so that the top of the fixed angle viewer is parallel to the work surface.
- ▶ Retighten the securing clamp.
- ▶ Replace the head on to the assembly and tighten the head securing screw **5**.



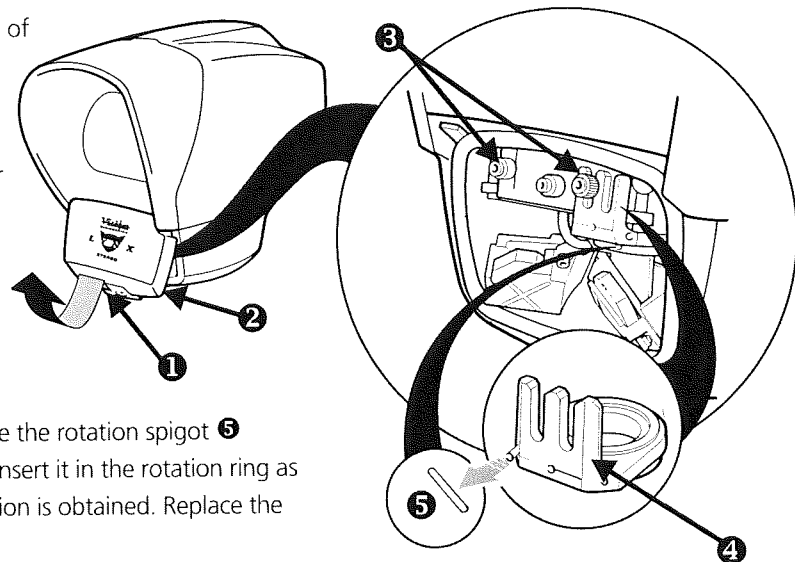
Ergowedge

- ▶ Remove the head ❶. Place the ergowedge ❷ into position and tighten the securing screw ❸.
- ▶ Replace the head on to the assembly and tighten the head securing screw ❹.
- ▶ The head can now be tilted forward and backward as required.



Graticule

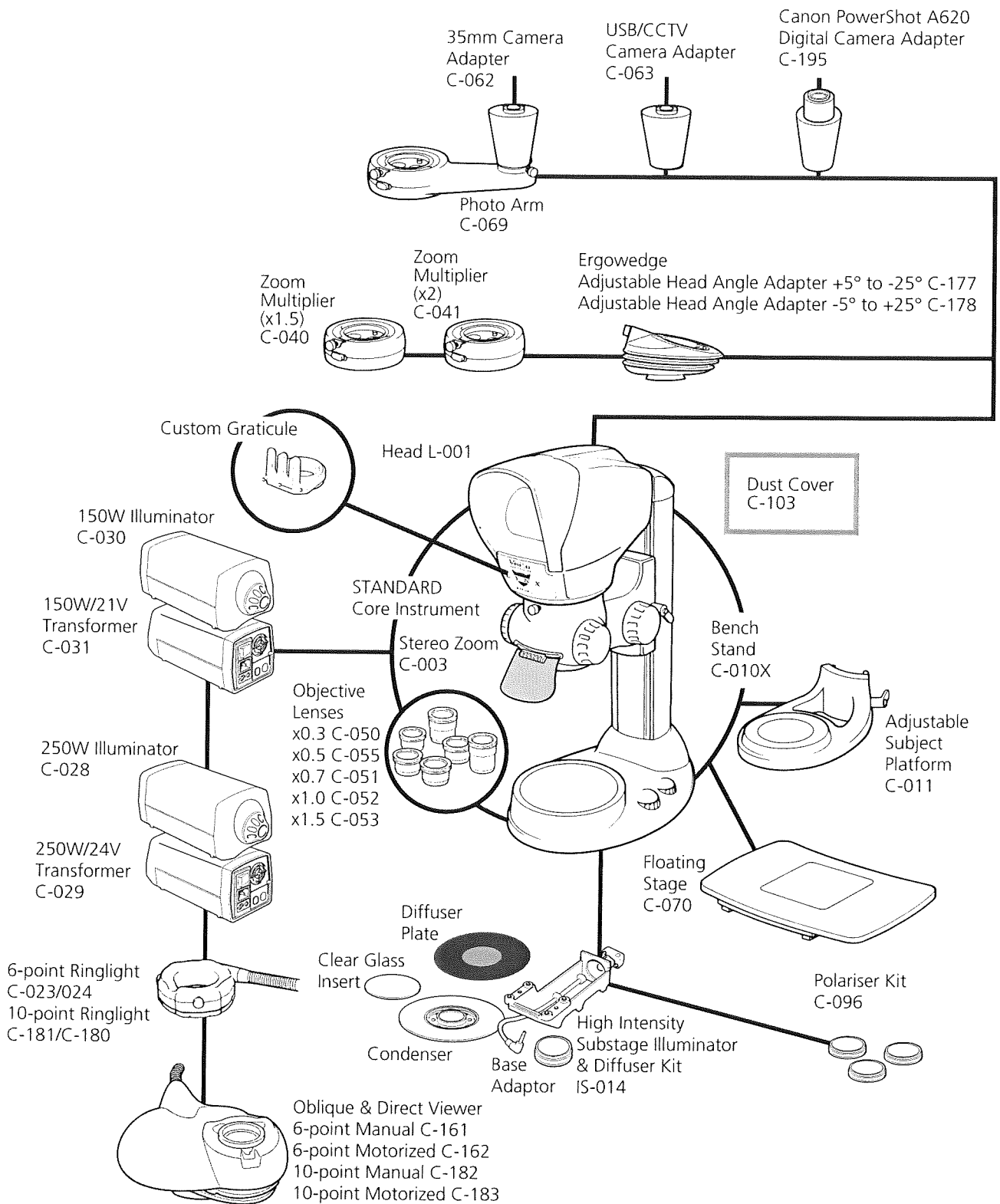
- ▶ Turn on the Lynx and place a subject in the centre of the viewing platform.
- ▶ Squeeze the securing clip ❶ at the base of the front cover ❷ and lift the cover off.
- ▶ Loosen the appropriate retaining knob ❸ (the graticule can be placed on either side of the head), slide the graticule ❹ into position and move the graticule up or down for focus and sideways to centralize. Re-tighten the retaining knob.
- ▶ To adjust the graticule rotationally, remove the rotation spigot ❺ from its storage position in the graticule, insert it in the rotation ring as shown and rotate it until the correct position is obtained. Replace the spigot and close the front cover.



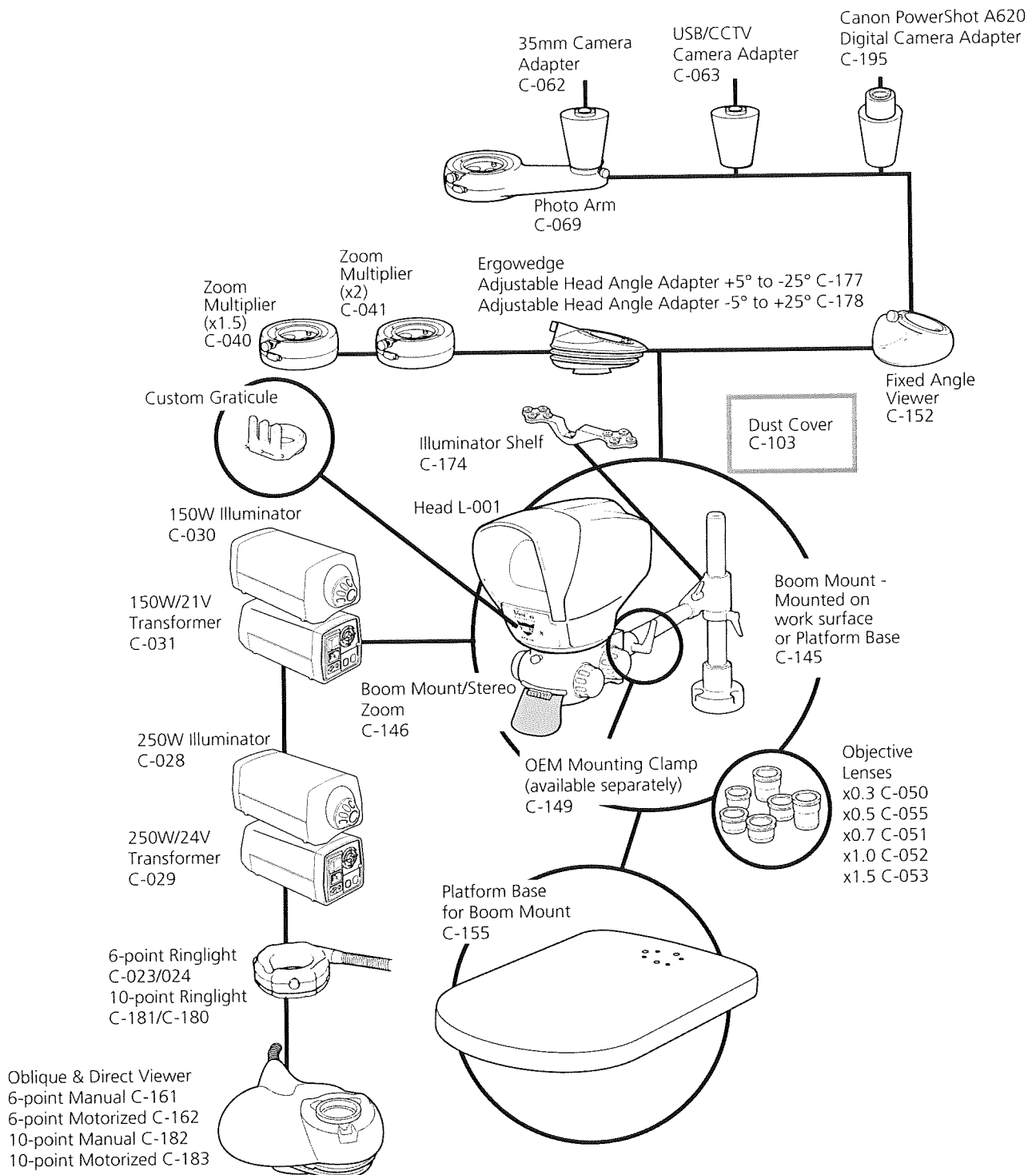
Note: For the use and operation of graduated graticules, refer to the datasheet supplied with the graticule.

PRODUCT FAMILY

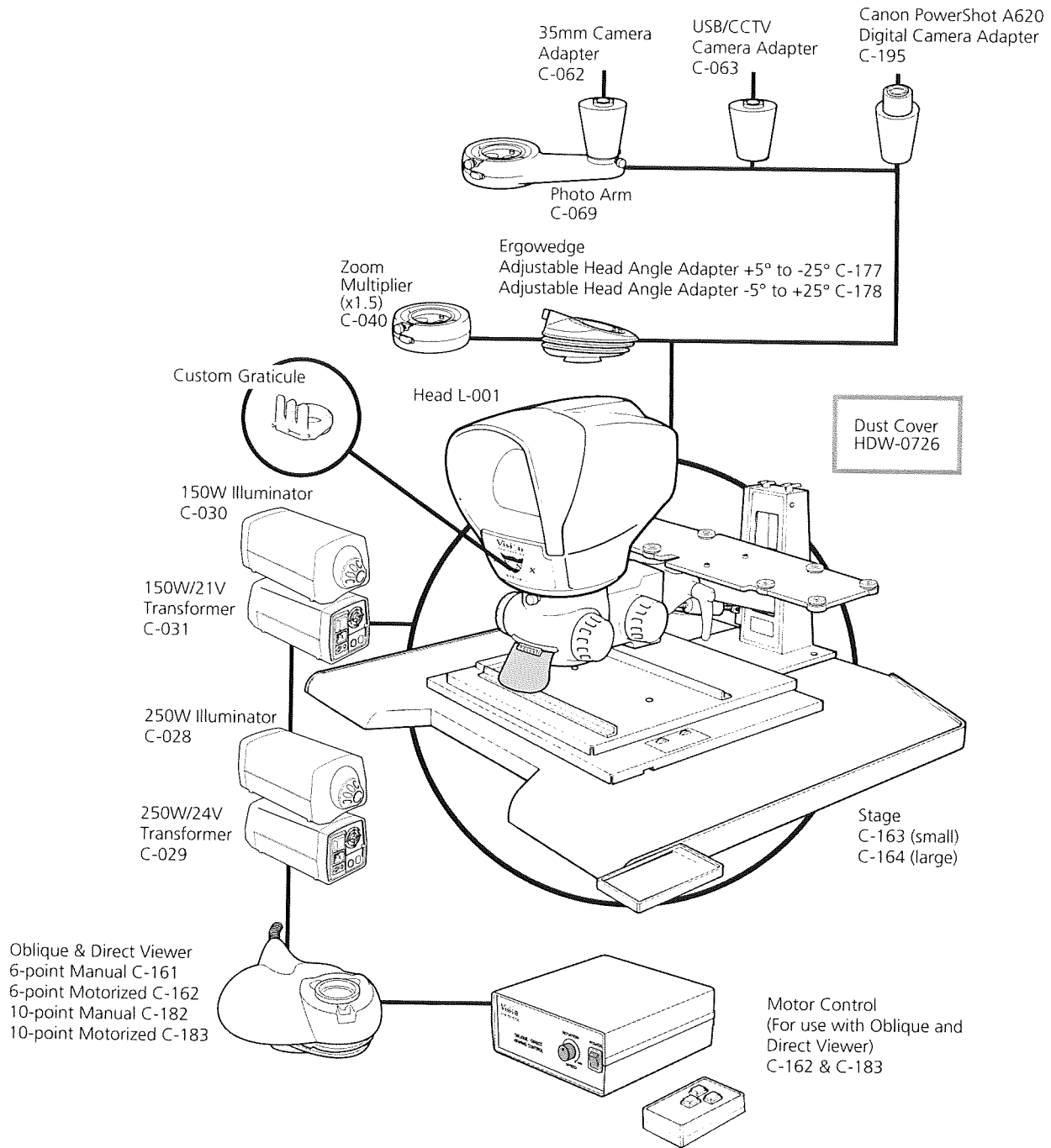
Bench stand



Boom mount

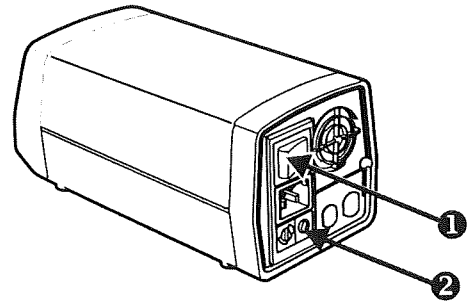


VS8



Illuminator power supply

The rear of the illuminator's power supply incorporates the on/off switch ❶ and the voltage selector ❷.

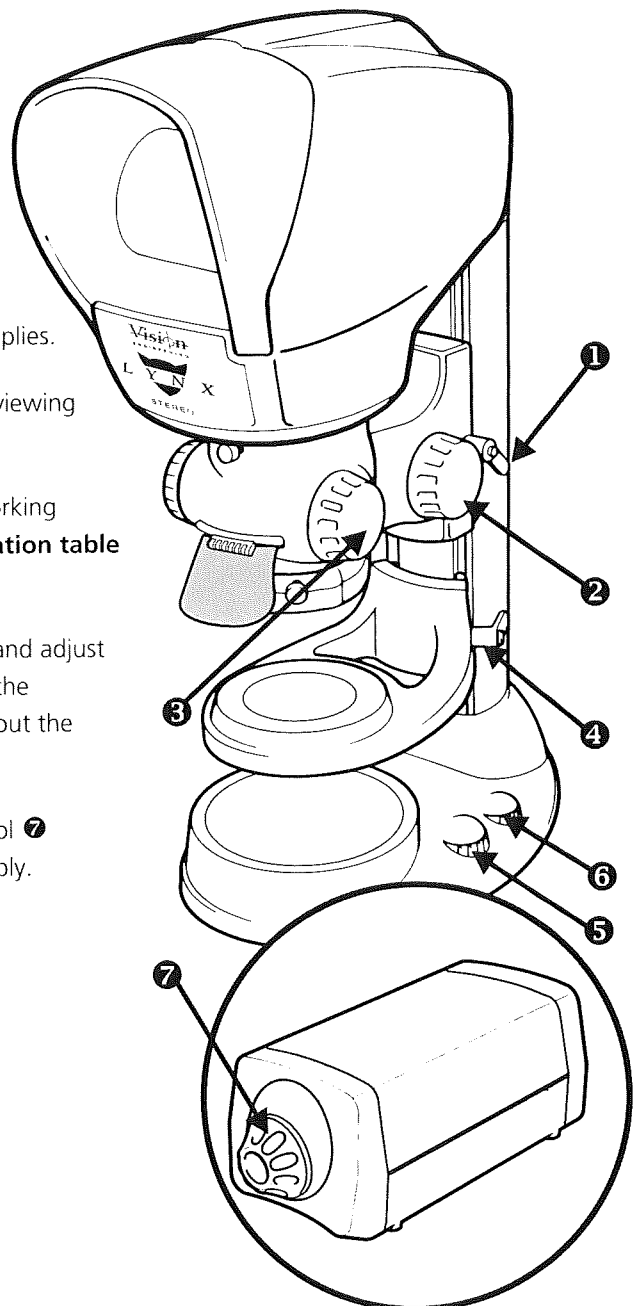


Bench stand controls

The bench stand controls are comprised of the zoom height control ❶, focus control ❷, zoom control ❸, subject platform height adjuster ❹, substage illuminator dimmer ❺ and redundant control ❻.

Getting started

- ▶ Turn on the illuminator and bench stand power supplies.
- ▶ Place the subject to be viewed in the centre of the viewing platform.
- ▶ Set the zoom height control to the approximate working distance for the objective lens fitted (see **Magnification table** on page 22).
- ▶ Turn the zoom control to maximum magnification and adjust the focus control to obtain a clear, sharp image of the subject. The focus will now be maintained throughout the zoom range.
- ▶ The level of illumination is adjusted using the control ❷ located on the front of the illuminator's power supply.

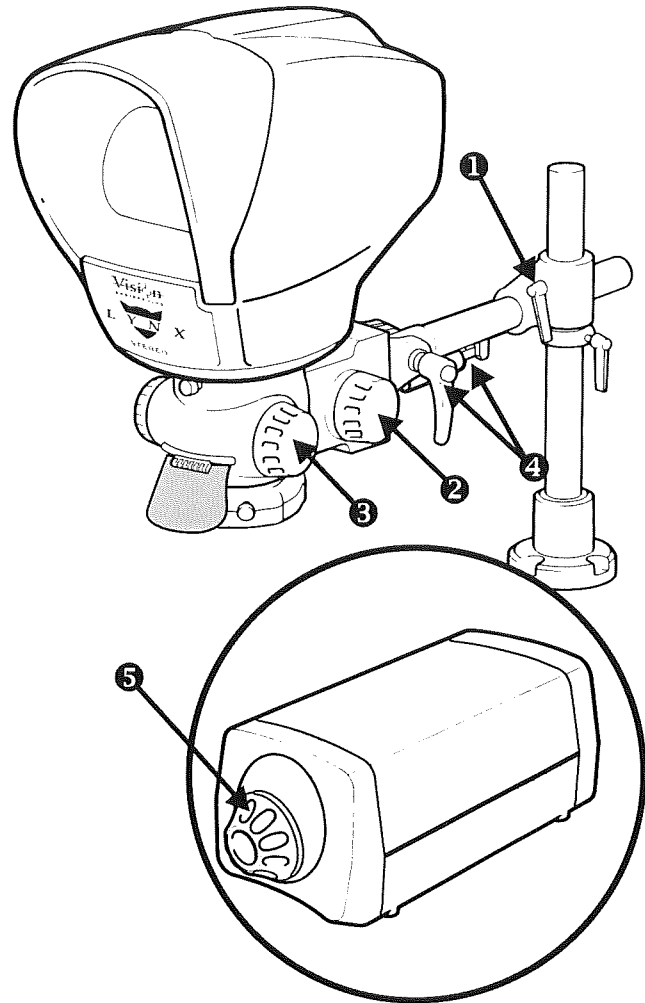


Boom mount controls

The boom mount controls are comprised of the head height control ①, focus control ②, zoom control ③ and zoom angle controls ④.

Getting started

- ▶ Turn on the illuminator and bench stand power supplies.
- ▶ Place the subject to be viewed in the centre of the viewing platform.
- ▶ Set the zoom height control to the approximate working distance for the objective lens fitted (see **Magnification table** on page 22).
- ▶ Turn the zoom control to maximum magnification and adjust the focus control to obtain a clear, sharp image of the subject. The focus will now be maintained throughout the zoom range.
- ▶ The level of illumination is adjusted using the control ⑤ located on the front of the illuminator's power supply.

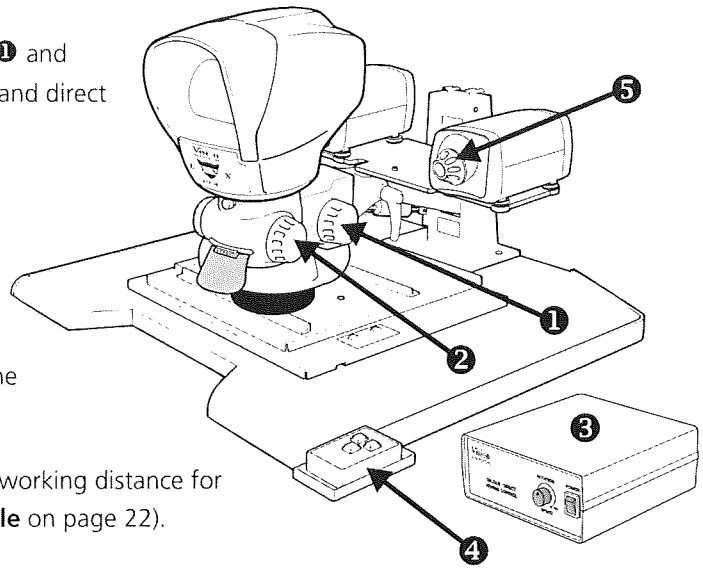


VS8 controls

The VS8 controls are comprised of the focus control ❶ and zoom control ❷ and the optional motorised oblique and direct viewer control box ❸ and remote control ❹.

Getting started

- ▶ Turn on the illuminator and bench stand power supplies.
- ▶ Place the subject to be viewed in the centre of the viewing platform.
- ▶ Set the zoom height control to the approximate working distance for the objective lens fitted (see **Magnification Table** on page 22).
- ▶ Turn the zoom control to maximum magnification and adjust the focus control to obtain a clear, sharp image of the subject. The focus will now be maintained throughout the zoom range.
- ▶ The level of illumination is adjusted using the control ❺ located on the front of the illuminator's power supply.
- ▶ For details of how to operate the oblique and direct viewer, see pages 11 and 12.



Magnification table

Objective lens	Zoom range			Working distance	Field of view at max zoom			Field of view at min zoom		
		with x1.5 multiplier	with x2 multiplier			with x1.5 multiplier	with x2 multiplier		with x1.5 multiplier	with x2 multiplier
x0.3*	x2.1 – x12	x3.2 – x18	x4.2 – x24	312mm	10.9mm	7.3mm	5.4mm	62.0mm	41.3mm	31.0mm
x0.5	x3.5 – x20	x5.3 – x30	x7.0 – x40	177mm	6.7mm	4.3mm	3.3mm	38.0mm	25.3mm	19.0mm
x0.7	x4.9 – x28	x7.4 – x42	x9.8 – x56	130mm	4.8mm	3.2mm	2.4mm	27.0mm	18.0mm	13.5mm
x1.0	x7.0 – x40	x10.5 – x60	x14 – x80	85mm	3.5mm	2.3mm	1.7mm	18.7mm	12.5mm	9.4mm
x1.5	x10.5 – x60	x15.8 – x90	x21 – x120	47mm	2.3mm	1.5mm	1.2mm	12.9mm	8.6mm	6.5mm

*When using the x0.3 objective lens with a bench stand model, an extended stand column is required to accommodate the increased working distance.

General care

- ▶ Cover your Lynx with a dust cover when not in use.
- ▶ Remove dust with a soft brush or cleaning cloth.
- ▶ The viewing screen and lenses should be cleaned with a lens cleaning cloth.
- ▶ Keep accessories in a dust-free environment when not in use.

Warning: Switch the mains supply to the unit off before performing any maintenance.

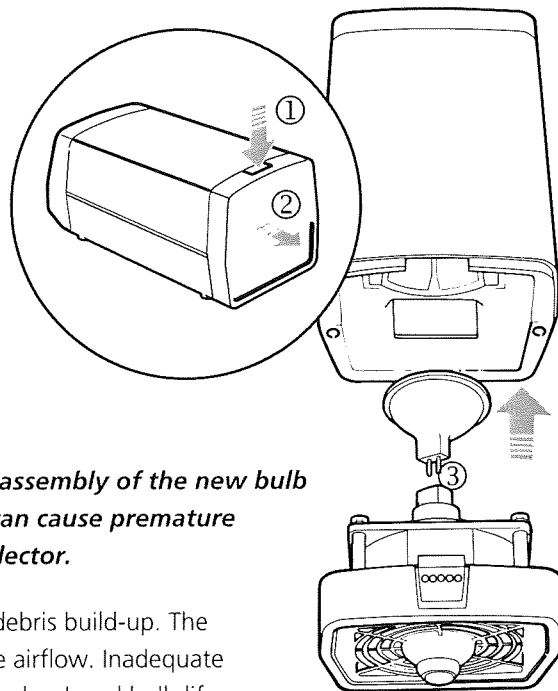
Illuminator lamp changing

Note: ENSURE THE ILLUMINATOR IS NOT HOT.

- ▶ Press the bulb/fan assembly release button (see ①).
- ▶ Lift out the bulb/fan assembly (see ②).
- ▶ Disconnect the lamp as shown in ③.
- ▶ When relocating the Halogen lamp, ensure it is fully pushed into the lamp holder.

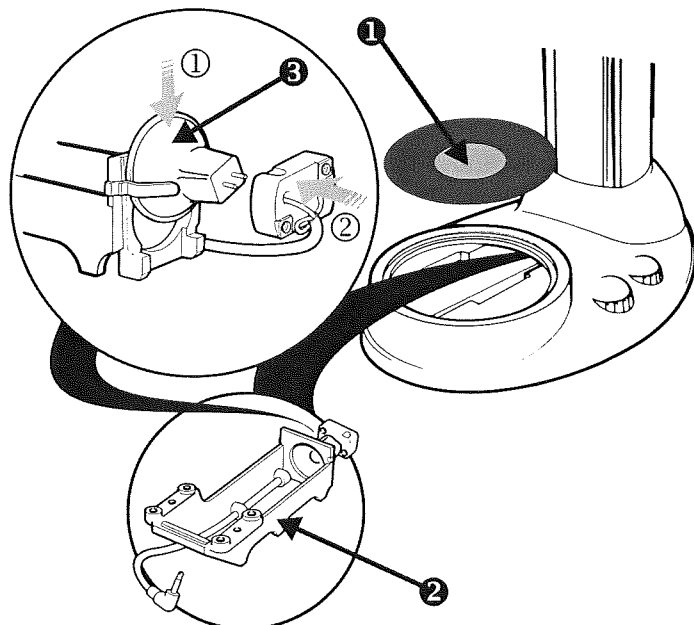
Note: DO NOT touch the base, pins or filament assembly of the new bulb during installation. Oil from your hands can cause premature bulb failure. Only hold the bulb by its reflector.

- ▶ Periodically inspect the cooling fan and its vents for debris build-up. The front and rear vents must be clean to allow adequate airflow. Inadequate airflow results in increased operating temperatures and reduced bulb life. The fan should be running whenever power is supplied to the illuminator.



Changing the substage bulb

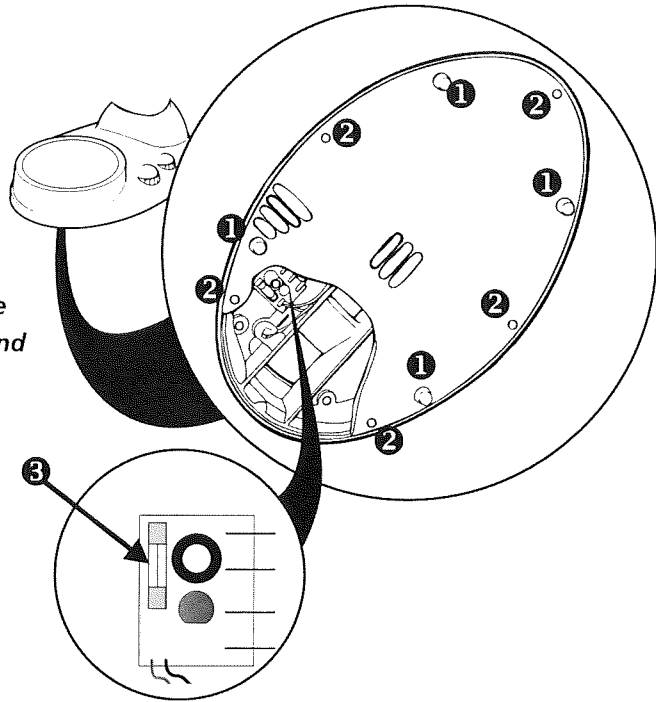
- ▶ Remove the condenser and diffuser plate ①.
- ▶ Disconnect and remove the substage illuminator ②.
- ▶ Remove the bulb ③ and replace it with a 20W/12V Dichroic lamp (2000 hour) as shown in ① and ②.
- ▶ Replace the substage illuminator, condenser and diffuser plate.



Changing the substage fuse

- ▶ Remove the four rubber feet ① from the base (push fit).
- ▶ Remove the five base securing screws ②.
- ▶ Replace the substage fuse ③ with an 800mA quick blow type.

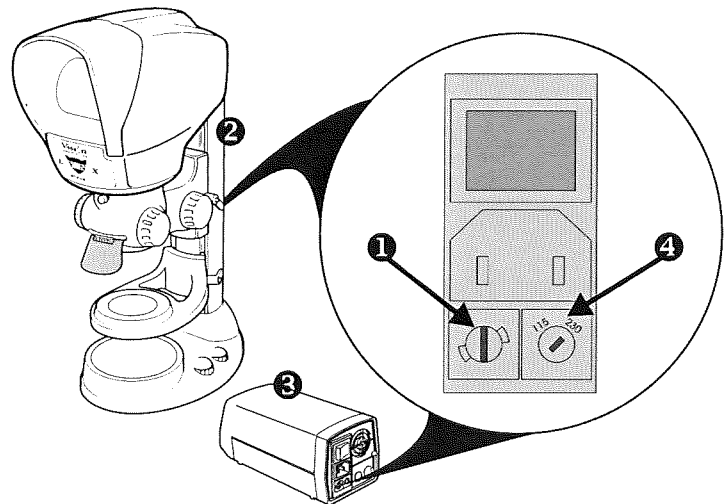
Note: *When the base is replaced, ensure the heat slots line up with the heatsink and substage bulb.*



Changing the mains input fuse

- ▶ The mains input fuse ① is located on the rear of the bench stand ② and the back panel of the power supply ③.
- ▶ Replace with the correctly rated fuse as indicated.

Note: *Ensure the voltage selector ④ is set to the correct mains supply voltage.*



Servicing

Service and repair work must only be carried out by service engineers authorised by Vision Engineering.

Environmental considerations

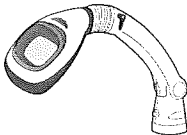
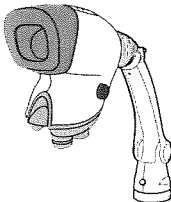
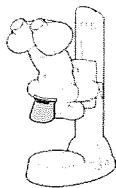
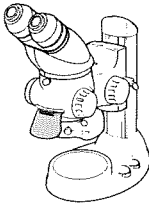
- ▶ Position the Lynx on a firm, rigid table
- ▶ Avoid locating the instrument near to any source of vibration
- ▶ Ensure illuminator power supply has sufficient ventilation
- ▶ Do not position the instrument close to a radiator or similar heating system
- ▶ Do not position the instrument in direct sunlight, or where bright reflections will prevent a comfortable viewing position.

Consumable and replacement parts

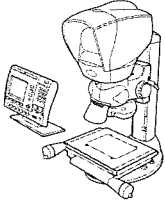
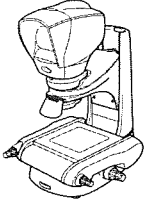
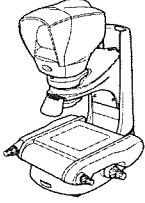
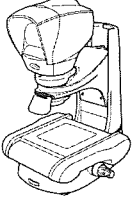
Item	Details	Part Number
Substage bulb	12V/20W (x4)	C-101
Illuminator bulb	21V/150W (x1) 24V/250W (x5)	C-102 C-156
Anti-glare shield	Hinged glare shield	C-126
Substage fuse	800mA quick blow fuse	FUS-0255

Vision Engineering manufactures a wide range of stereo inspection and non-contact measuring systems. For all product information, please visit our website.

Stereo inspection systems

Product	Picture	Features	Description
Lentis		<ul style="list-style-type: none"> • 2.5 dioptres • Multi layered anti reflective coated lens 	A state of the art bench magnifier for inspection, manipulation and material rework.
Mantis		<ul style="list-style-type: none"> • x4 - x20 Magnification • Shadow-free LED cold illumination, both surface and substage • Long working distances, large depth of field 	The Mantis family is a unique range of optical systems without eyepieces, for intricate tasks requiring superb quality viewing over long periods of use. Available with universal arm or rigid bench stand option.
Alpha		<ul style="list-style-type: none"> • x2.1 – x160 magnification • Camera option • Expanded Pupil eyepieces 	Expanded Pupil eyepiece stereo zoom microscope. Available in boom and bench stand configuration with a wide range of optional accessories (e.g. lighting, cameras)
Beta		<ul style="list-style-type: none"> • x2.1 – x160 magnification • Camera option • Conventional eyepieces 	Conventional eyepiece stereo zoom microscope. Available in boom and bench stand configuration with a wide range of optional accessories (e.g. lighting, cameras)

Non-contact measuring systems

Product	Picture	Features	Description
Kestrel		<ul style="list-style-type: none"> • 150mm x 100mm stage • QC200 Microprocessor • Eyepieceless viewing system 	Entry level, 2-axis measuring system. Ideal for shop floor gauging applications.
Hawk manual		<ul style="list-style-type: none"> • 150mm x 150mm stage • 2 or 3 axis capability • Large stage option • Eyepieceless viewing system 	Advanced manual measuring system, offering increased accuracy and capacity. Operates with QC200 and QC300 microprocessors.
Hawk precision		<ul style="list-style-type: none"> • 200mm x 150mm stage • 2 or 3 axis capability • Eyepieceless viewing system 	High accuracy measuring system for 2 and 3 axis measurement. Operates with QC200 and QC300 microprocessors or QC5000 PC software.
Hawk automatic		<ul style="list-style-type: none"> • 200mm x 150mm stage • Video Edge Detection • Motorised stage movement • 2 or 3 axis capability 	Automated measuring system combining optical viewing head with PC based Video Edge Detection. 2 and 3 axis motorised stage movement controlled by QC5000 PC software.



WARRANTY

This product is warranted to be free from defects in material and workmanship for a period of one year from the date of invoice to the original purchaser.

If during the warranty period the product is found to be defective, it will be repaired or replaced at facilities of Vision Engineering or elsewhere, all at the option of Vision Engineering. However, Vision Engineering reserves the right to refund the purchase price if it is unable to provide replacement, and repair is not commercially practicable or cannot be timely made. Parts not of Vision Engineering manufacture carry only the warranty of their manufacturer. Expendable components such as fuses carry no warranty.

This warranty does not cover damage in transit, damage caused by misuse, neglect, or carelessness, or damage resulting from either improper servicing or modification by other than Vision Engineering approved service personnel. Further, this warranty does not cover any routine maintenance work on the product described in the user guide or any minor maintenance work which is reasonably expected to be performed by the purchaser.

No responsibility is assumed for unsatisfactory operating performance due to environmental conditions such as humidity, dust, corrosive chemicals, deposition of oil or other foreign matter, spillage, or other conditions beyond the control of Vision Engineering.

Except as stated herein, Vision Engineering makes no other warranties, express or implied by law, whether for resale, fitness for a particular purpose or otherwise. Further, Vision Engineering shall not under any circumstances be liable for incidental, consequential or other damages.