

# Revelation **ZOOM**

Owner's Manual



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## 1 - General and Safety Information

This Manual intends to familiarize you with the utilization and cautions to your equipment. Contact Seiler Precision Microscopes in case of some doubt. Seiler Precision Microscopes, reserves itself the right of perform changes or modifications on its products due to improvements. Notice this manual release version; safety information and accessories available are updated until this revision. Always contact Seiler Precision Microscopes before you perform an alteration in your equipment. Seiler Precision Microscopes does not take responsibility due damages resulting from non-observation of this Manual content – professionals have to be trained before its use. Seiler Precision Microscopes does not have responsibility of any thirties parts claims due to the equipment utilization.

### 1a – Advices:

Some advices information are important, attempting special cautions. They are classified according to the risk degree and are highlighted as below:



**DANGER:** This symbol and the text along with it mark personal damages danger condition.



**ATTENTION:** This symbol and the text along with it mark the possibility of personal damages.

**NOTICE:** This text marks the possibility of damages to the equipment.

### 1b – Safety Advertisements



**DANGER:** The greater is the oxygen concentration, the faster is the combustion. There is fire risk when electric equipments are used in high oxygen concentrated ambient. There is the possibility of explosion when used in presence of flammable anesthetics. Before using the equipment, read carefully the user's manual, its accessories utilization and cautions advertisements.



**DANGER:** Contamination risk. Special attention must be kept when cleaning and disinfecting the equipment, in order to avoid undesirable risks.



**ATTENTION:** Electric shock risk. Exclusively Seiler Precision Microscopes personnel must open the equipment. Inside it there are not user's serviceable parts (nor mechanics, electricians or optics).



**ATTENTION:** Burning damages. Be sure the lamp is at environment temperature before touching it.



**ATTENTION:** Special caution must be kept to the power cable. Never pull it to disconnect from the outlet; always pull it handling the connector. To turn off the equipment, always switch off the main switch.

Do not let objects on it; it can be damaged by the object weight. Avoid stepping on it. Do not let it stretched avoiding falls and undesirable disconnection. Electric extension cable must be used carefully, considering its capability; it may cause the cable overheating. In case of nonoperation long periods, unplug the cable from the outlet.

### 1c – Precautions

**NOTICE:** Never immerse the equipment (even if turned off and disconnected from the power line) its parts or accessories in liquids, nor use caustics or abrasives cleaning products. Follow the Cleaning and Disinfection instructions on section 6b.

**NOTICE:** Do not touch the lamp glass bulb with your naked fingers. The skin natural grease deposits over it reducing considerably its life.

**NOTICE:** Special care must be kept with the Fiber Optical Cable. Do not bend or smash it under risk of damage.

In its construction, hundreds of fibers were used, and they can break, reducing considerably the light flux. If you need removing (cleaning, maintenance, etc.), roll it up in a 10cm (4”) radius and place it on a protected place. Especial attention must be kept with the ends, naturally more rigid than its body and do not allow any bend.

**NOTICE:** Avoid mechanical shocks on the optical head or on the binoculars; they can cause optical misalignments.

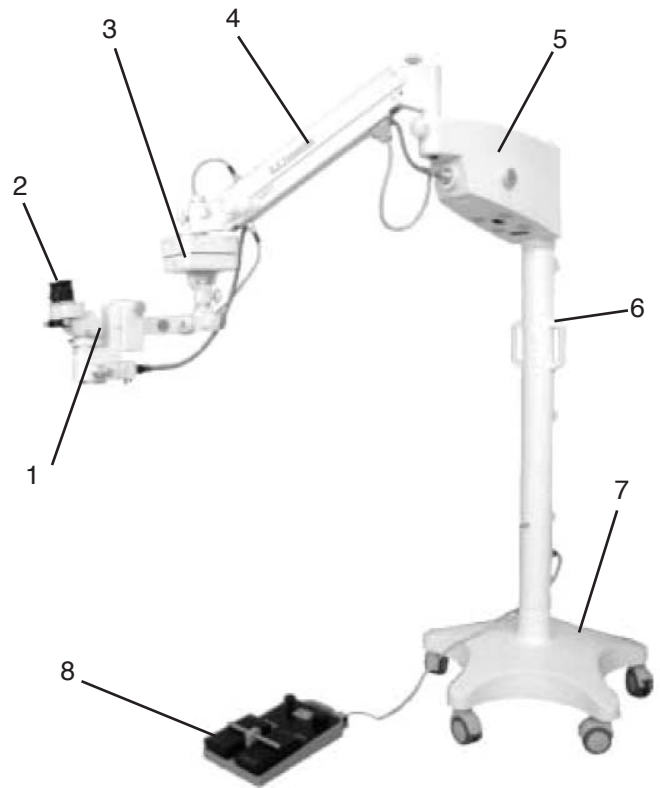
**NOTICE:** Only after you are sure the equipment as a whole is correctly assembled connect the equipment power cable to the wall outlet.

**NOTICE:** Electromagnetic interference – This equipment is not affected by electromagnetic interference.

## 2 - Description and Technical Data

This equipment was developed under rigid manufacture and quality control standards, produced for utilization on surgical or diagnosis procedures.

The following figure describes the equipment main parts:



1. Optical Head
2. Binoculars
3. XY System (MC-M3101XY Plus version)
4. Pantographic Arm
5. Cold Light Generator Arm
6. Column
7. Base with Casters
8. Multi-function pedal

| Technical Data   |                              |
|--|------------------------------|
| <b>A – Optical head</b>                                  |                              |
| Apochromatic objective Ø55mm                             | Focal length = 200mm         |
| Observed field   | 9 to 54mm                    |
| Illuminated field diameter                               | 55mm                         |
| Light intensity  | >120000lux                   |
| Continuous zoom magnification system, manual or by pedal | 0,4 – 2,4 (3,9x to 23,3x)    |
| Handles  | 2 removable and sterilizable |
| Filter   |                              |
| Micro focalization displacement                          | ±25mm                        |
| Rotation movement on the vertical - longitudinal plane   | -45° to +45°                 |
| Rotation movement on the vertical transversal plane      | -150° to +150°               |
| Weight (approximately)                                   | 4,5Kg                        |
| <b>B - Binoculars</b>                                    |                              |
| Inclinable   | 0° to 60°                    |
| Eyepieces  | Wide angle, 12,5x            |
| Focal length   | 155mm                        |
| Interpupillary distance                                  | 55 to 75mm                   |
| Weight   | 0,93Kg                       |

|   |   |
|---|---|
| <b>C - Cold light generator arm</b>                       |   |
| Automatic power supply                                    | 100 to 240VCA   |
| Main lamp   | 2 Halogen – cold mirror<br>15V/150W                           |
| Optical fiber cable                                       | 1,70m   |
| <b>D – Pantographic arm</b>                               |   |
| Vertical displacement                                     | -350 to +350mm  |
| Total length  | 690mm   |
| Video power connection                                    | 12VDC – 200mA   |
| Weight  | 5,0Kg   |
| <b>E – Floor stand</b>                                    |   |
| 5 ends star type base                                     | Ø720mm  |
| Weight  | 32,5Kg  |
| Casters   | 5 (2 with brakes)   |
| Additional weight   | 5x 4Kg each one   |
| <b>F – XY System (for MC-M3101XY Plus version)</b>        |   |
| X axis displacement                                       | 40mm  |
| Y axis displacement                                       | 40mm  |
| Auto reset button (X and Y axis centering)                |   |
| Weight  | 2,15Kg  |
| <b>G – Multi-function pedal</b>                           |   |
| Right pedal   | Zoom control  |
| Left pedal  | Focalization control  |
| Upper right side switch                                   | On / Off main lamp control                                    |
| Joystick at upper left side (for MC-M3101XY Plus version) | X/Y displacement command                                      |
| <b>H - Optional components</b>                            |   |
| Objective lens  | 175mm,<br>250mm,<br>300mm,<br>350mm, and<br>400mm             |
| Filter  | Green, Orange,<br>Cobalt Blue,<br>Anticaloric and<br>Neutral. |
| <b>Coaxial illumination</b>                               |   |
| 45° Inclined binoculars, Porro II system                  | 125mm focal length  |
| 45° Inclined binoculars, Porro II system                  | 160mm focal length  |
| Straight binoculars, Porro II telephoto system            | 125mm focal length  |
| Straight binoculars, Porro I system                       | 160mm focal length  |
| Eyepiece, focal length = 25mm                             | 10x magnification   |
| Extension arm   | 300mm, 90°  |
| Short straight terminal                                   | 90°   |

### 3 - Equipment Reception

3a – Check out

Inform immediately the delivery company in case of damages or violation at the packing.

3b - Parts List

The following parts are supplied along with the equipment:

| Item:                               | Quantity: |
|-------------------------------------|-----------|
| Column                              | 01        |
| Pantographic arm                    | 01        |
| Optical fiber cable                 | 01        |
| Power cable                         | 01        |
| Base with casters                   | 01        |
| 3/8" x 1" Allen screws              | 02        |
| Allen key                           | 01        |
| Column Knob                         | 01        |
| First arm with cold light generator | 01        |
| Main lamp                           | 02        |
| Optical head (with fork)            | 01        |
| Binoculars                          | 01        |
| Handle                              | 02        |
| Camera power cable                  | 01        |
| Pedal (with harness)                | 01        |
| XY assembly (for MC-M3101XY Plus)   | 01        |
| Cover                               | 01        |

If any part is missed contact D.F.Vasconcellos dealer informing the equipment serial number.

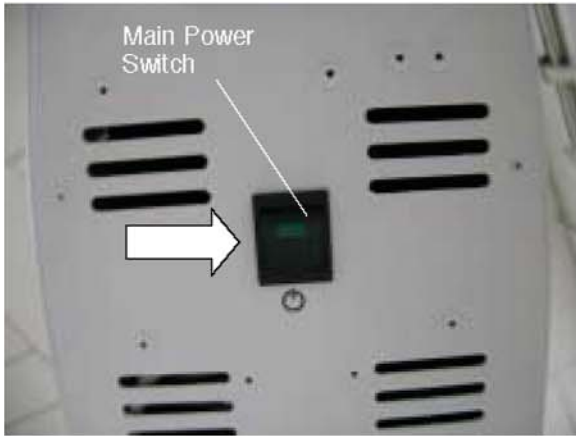
### 4 - Assembly and Installation

The Seiler Precision Microscopes dealer, or its legal representative, must assemble and install the equipment.

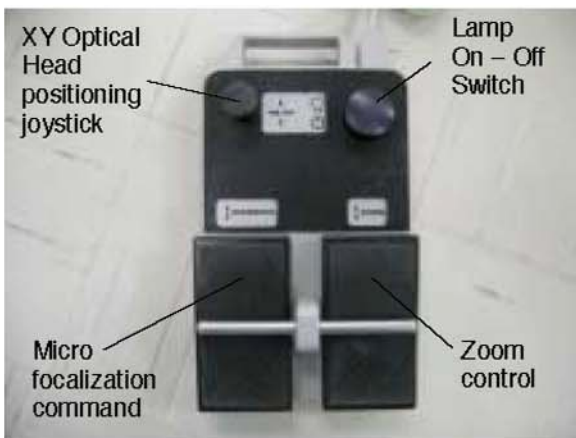
**NOTICE:** Only after you are sure the equipment as a whole is correctly assembled connect the equipment power cable to the wall outlet.

## 5 - Operation

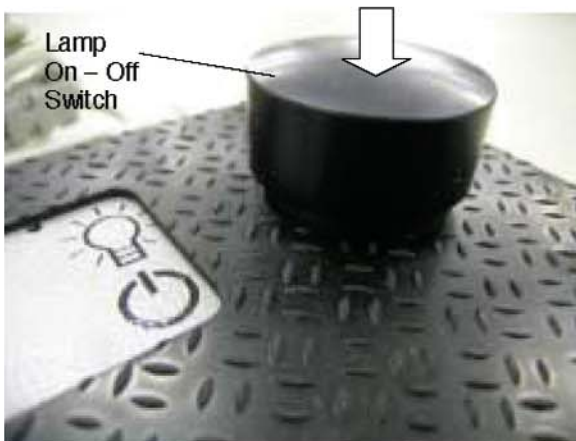
Put on the equipment by pressing the main powerswitch, on the cold light generator arm lower panel.



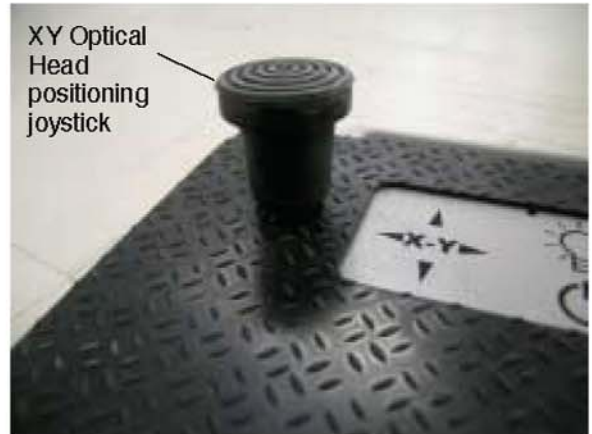
Microscope commands are located on the pedal, as described in the following figure:



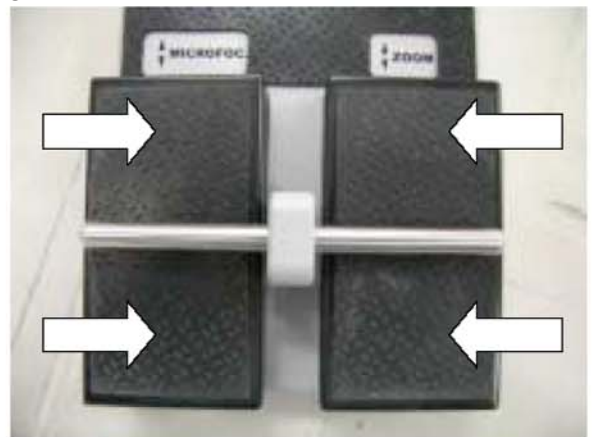
Press the lamp On - Off switch, to command the lamp status (On or Off).



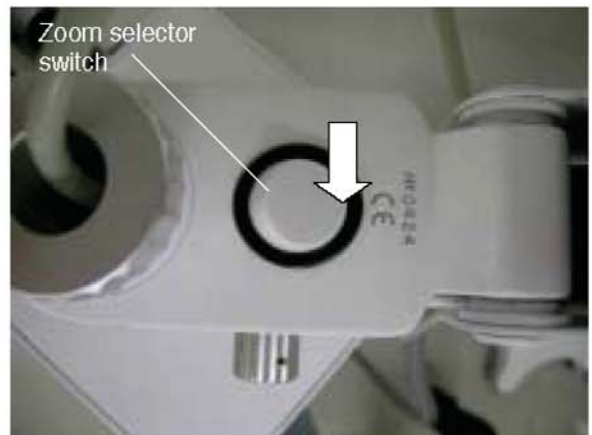
The XY optical head-positioning joystick locates the optical head as desired on the X and Y axis. Push or pull the lever to move the optical head.



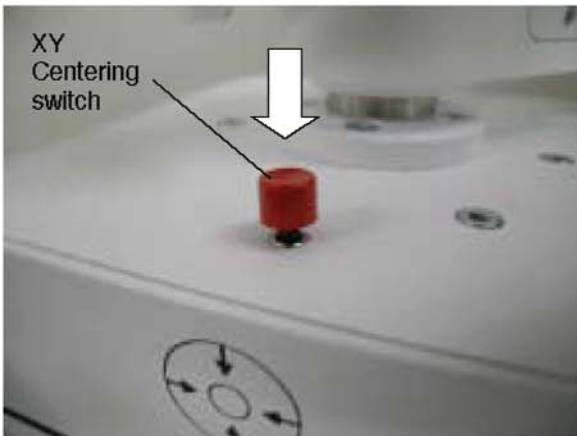
The micro focalization pedal commands optical head focus. Zoom pedal alters continuously the optical head magnification, when its rear or front side is pressed.



Keep the selector switch, located on the upper side of pantographic arm, at the position shown below, to prepare the zoom pedal.



Press the XY Centering Switch to retrieve the X and Y central point position; optical head resumes the central position automatically.



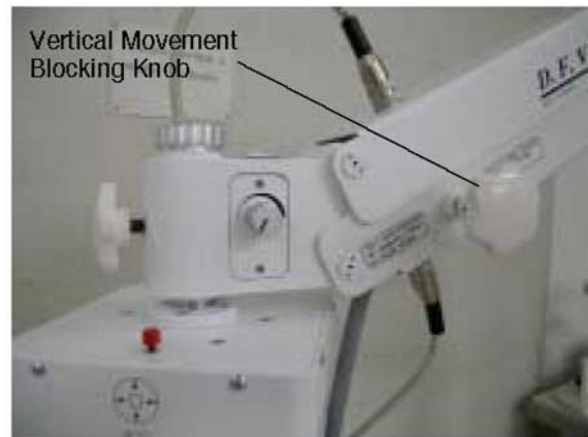
Adjust the cold light generator arm blocking knob to block rotation movement.



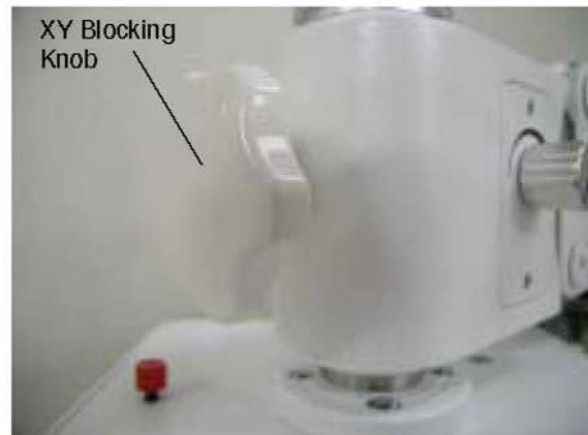
Adjust the pantographic arm blocking knob to block its rotation movement.



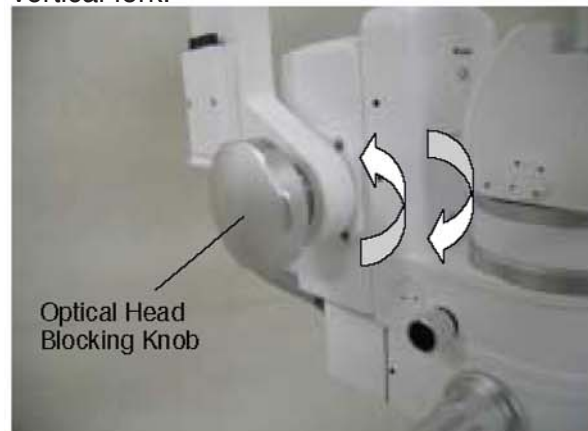
Pantographic arm vertical movement may be blocked acting the vertical movement blocking knob.



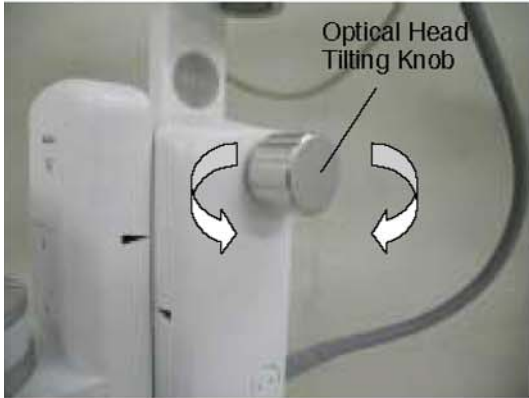
XY system turn movement may be blocked adjusting the XY blocking knob.



Optical head tilting movement may be blocked by the optical head blocking knob. Keep the knob lightly adjusted allowing small movements. Following image shows equipment assembled with vertical fork.



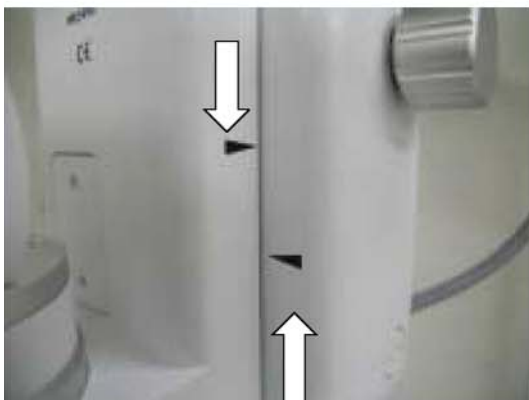
This movement may be adjusted manually or by the means of optical head tilting knob, for small displacements. Following image shows equipment assembled with vertical fork.



Immobilize the equipment on the floor applying the brakes on the casters (2). Press down the caster lever to brake it; pull it up to release brake.



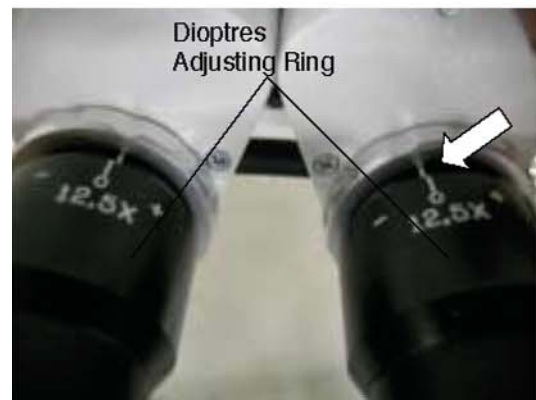
Focus the microscope. Acting on the micro focalization pedal the optical head slides. When two arrows are aligned, optical head is at the focalization central point.



Move the stand set, and pantographic arm making the distance between the objective lens and the object to focus approximately the objective lens focal length (engraved on the objective lens, in millimeters). That is for a 200mm objective keep a distance of about 200mm to the object to focus. Adjust zoom control (on the pedal) to the maximum magnification (2,4 position - 23,2x). Magnification scale is seen in the optical head viewfinder.



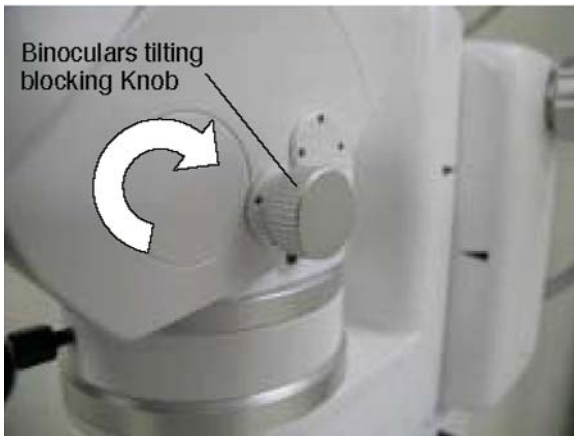
Adjust both eyepieces to zero dioptres. Press eyepiece red button and turn the dioptres-adjusting ring to align the marks.



Put the light system on pressing the pedal switch (lamp On – Off switch). Adjust light intensity on the potentiometer, at the end of pantographic arm.



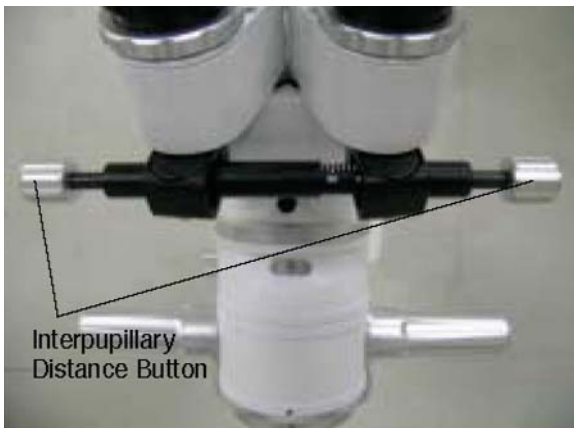
Binoculars watching angle may be adjusted. Loosen the binoculars tilting blocking knob, and set it to the desired position.



Watching through the left eyepiece, and closing the right eye, adjust focus by acting the micro focalization pedal, until seen the object image sharply.

Watch now through the right eyepiece, and close the left eye. Adjust right eye focus by turning the right eyepiece dioptrics-adjusting ring.

Afterwards, adjust binoculars interpupillary distance. Turn the interpupillary distance button; the interpupillary distance increases or decreases.

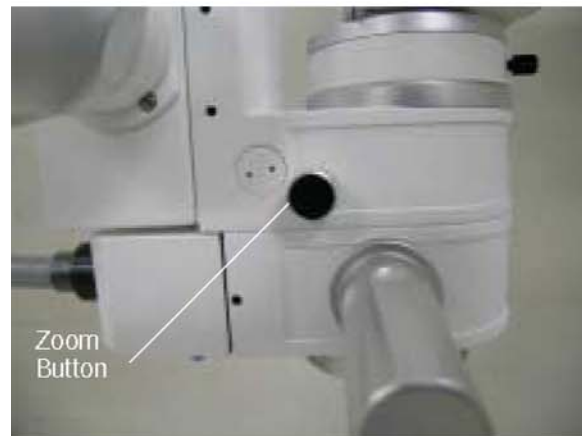


Object image must be clear and stereoscopic.

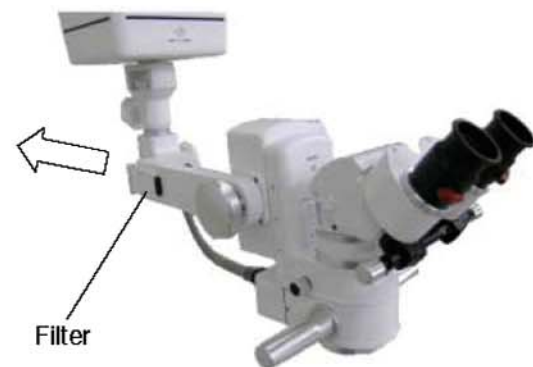
If desired, zoom control may be manually adjusted. Thus, free the electrical movement, by reverting the zoom selector switch. Press it at shown side to allow manual adjusting.



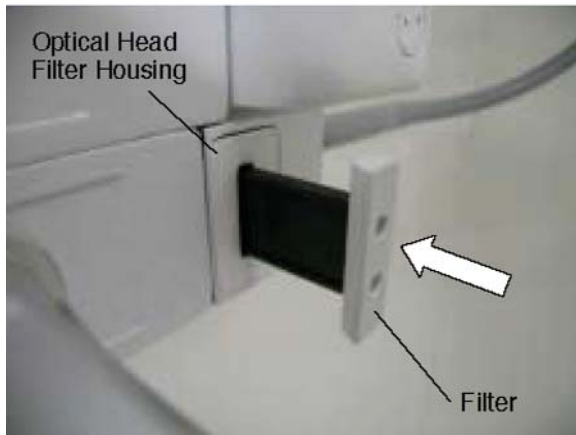
Then adjust magnification on the zoom button.



When needed, set the filter. It is at optical head left side. Pull it rearwards removing from the housing. Following image shows equipment with 90° terminal.



Set it into the optical head filter housing.

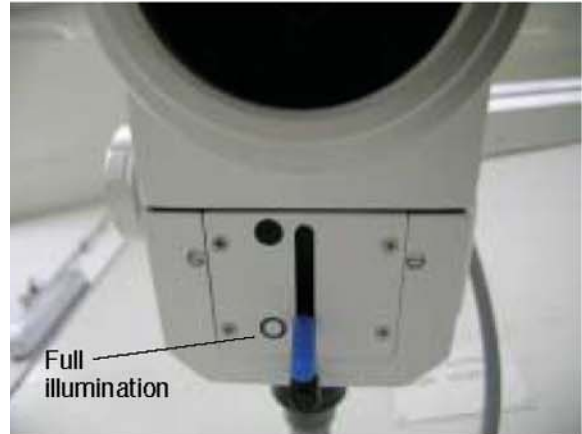


To illuminate the focused object on a zero degree incident light angle, dim the panoramic illumination sliding the blue lever to the position marked with a black circle. Panoramic illumination dims as the lever is acted.

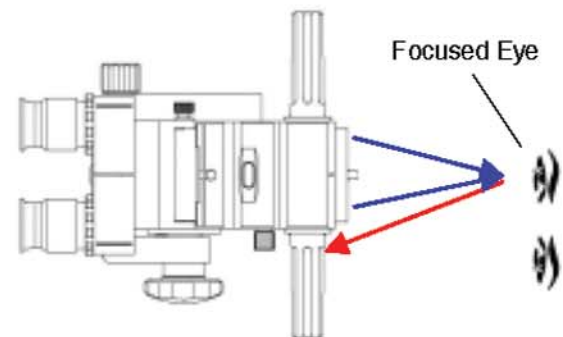
Only zero degree illumination lights the object at the end of its travel. This device is useful when dept of focus is required.



To restore full illumination, slide lever to the regular position.



For ophthalmologic use: eye's red reflex might be obtained when patient looks to the handle, approximately at the red arrow signed position. Act the coaxial illumination device, keeping only a small portion of panoramic illumination on duty.

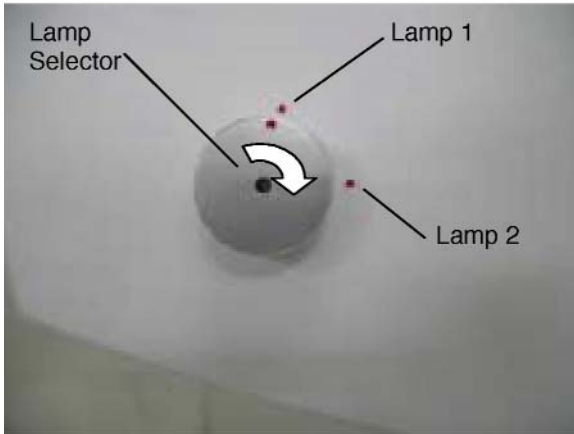


Pantographic arm connector allows connection of video system, when desired (12V, 200mACC).

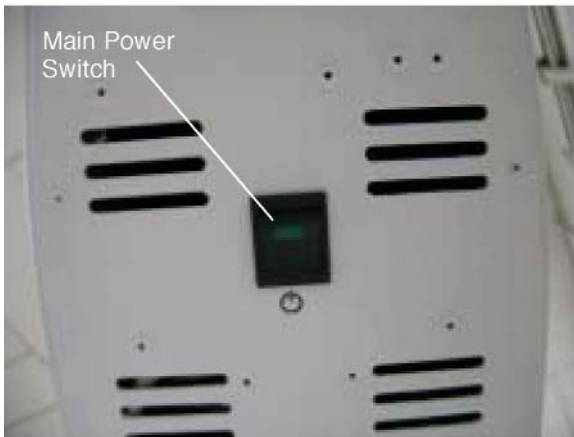


**NOTICE:** Do not exceed torque. Threads can be damaged.

The lamp selector allows selecting the lamp in use. There are two lamps. Keep it always at the same position. This way, second lamp is on good condition when it is selected.



Always switch off the equipment acting on the main power switch. Do not disconnect power cable to do this.



In order to increase lamp life, dim the lamp intensity to the minimum and wait for about 1 minute before switching off the equipment. This procedure allows fan cooling the lamp.

## 6 - Maintenance

### 6a - Periodic

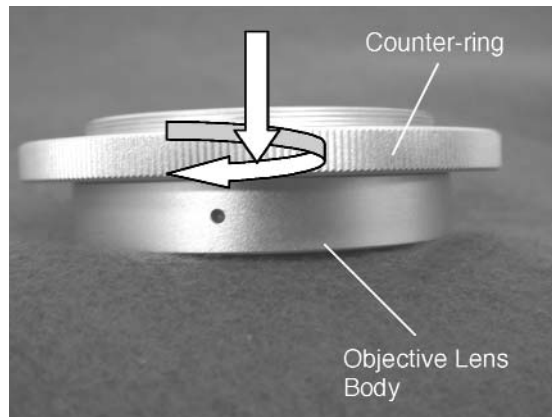
#### 6a1 – Objective Lens Removal and Adjusting

Unscrew the objective lens to remove it from the optical head (cleaning disinfection, etc). When screwing it back pay attention with threads (objective lens and optical head).

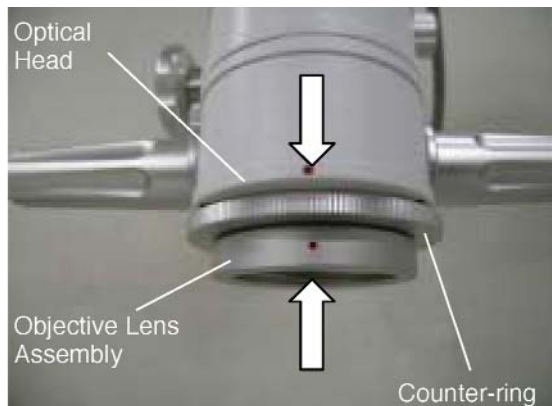


For 300mm, 350mm and 400mm focal length objective lens, set them back to the optical head following the instructions below.

Screw the counter-ring completely in the objective lens body.



Screw the objective lens assembly fully in the optical head. Unscrew it until aligning the red dots (on the optical head and on the objective body). Adjust counter-ring.



**NOTICE:** Do not exceed torque. Threads can be damaged.

### 6a2 – Pantographic Arm Balancing

If an accessory is installed, adjust pantographic arm balancing. Balancing knob (at pantographic arm upper side) increases pantographic arm inner spring tension when turned counterclockwise. Lift pantographic arm fully before adjusting the balancing knob. Adjust it until pantographic arm stands still at a desired position. Increase lightly the balancing knob, making a tendency to leave it slide upwards. Thus, if a non-intended movement occurs, optical head will move away from the focused object.



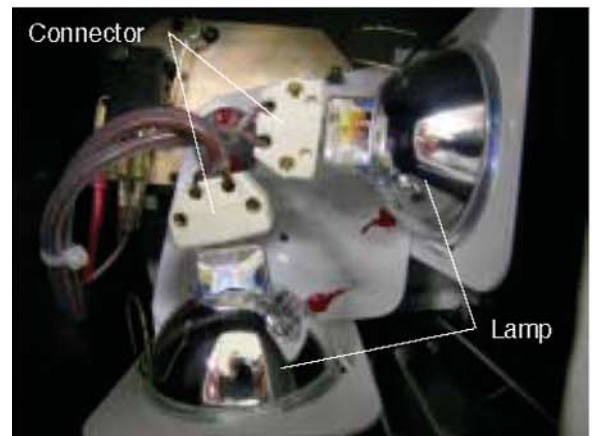
Both lamps are set on a tilting support.

### 6a3 – Lamp Replacement

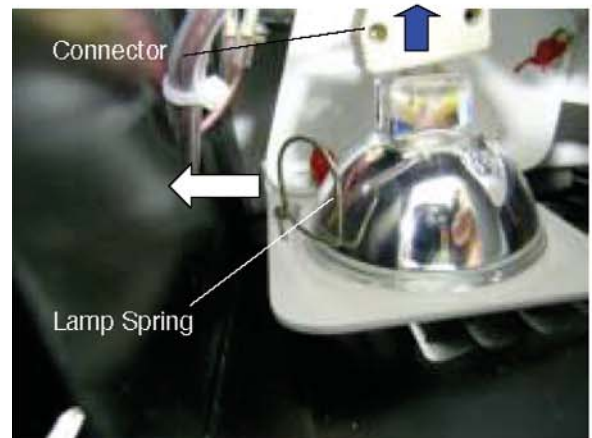
Turn off the equipment and unplug the power cable from the outlet. Loosen the lamp compartment button for accessing the lamp.



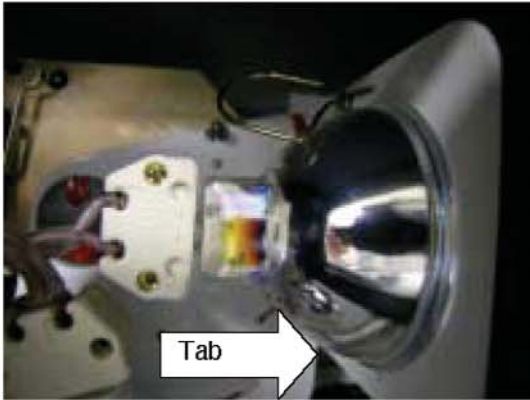
Remove cover.



Push the lamp spring outwards the lamp to loosen it. Disconnect the connector, and replace the lamp.

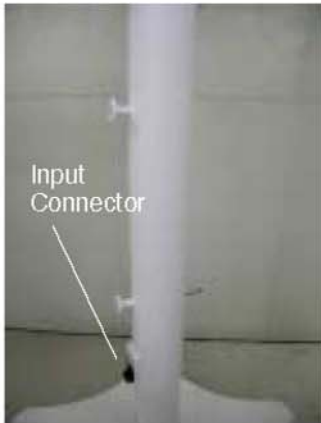


Install the new lamp and connect the connector. Make sure the lamp is centered in the support to assure the lamp is in focus. A non-centered lamp may cause loss of light. Lamp must fit in the tab.

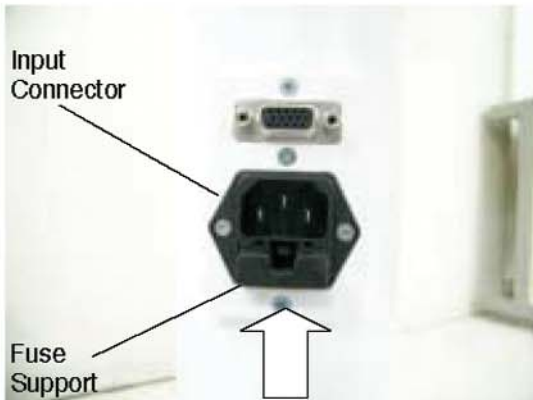


**6a4 – Fuse Replacement**

Turn off the equipment and unplug the power cable from the outlet. Fuses (2x 2,5A) are set into the input connector, at the stand set column.



Using a small screwdriver remove the fuse support to access the fuses. Replace them as needed.



**6b – Cleaning and Disinfection**

This procedure must be performed just after utilization, in order to avoid contamination.

**6b1 - Lenses**

For lens surface cleaning use cotton rolled on a stick lightly soaked up in ethylic alcohol or ether. Using soft and circular movements, clean its surface until you are sure it is fully cleaned. Avoid spreading the impurities replacing cotton often. Remove blotched blood by the means of peroxide (at 10%). Apply alcohol or ether just after.

**6b2 – Metallic Parts**

Use a non-abrasive sponge, or soft cloth, soaked up in a neutral soap water solution, diluted as 10ml for each water liter. Do not use general use domestic soap. Do not exceed the solution, avoiding it pouring out. Wait surfaces dry naturally or dry them with paper towels. Apply the sponge once more (or cloth), soaked up in a bactericide water solution at 50%. Optical head handles may be removed for cleaning. Pull them outwards to remove.



### 6b3 – Cleaning and Disinfection Advices

Discard the cotton, after using it, in a safe way. If non discard material was used, as sponges, clothes and brushes, reserve them only for this purpose and, after using, clean and disinfect keeping them immersed in an bactericide solution for at least 30 minutes.



**ATTENTION:** Wear personal protective equipment for this procedure.

To protect the objective lens there is the Sterilizable Objective Protector. As an accessory, it is set in front of the objective lens protecting against

impurities, and can be removed during a surgery for cleaning.

Handling parts of the equipment, or evenly touched (handles, fiber optical cable, etc.) may be protected with PVC film (or plastic covers), that should be discarded and replaced at every procedure. Make sure of not closing the Cold Light Generator vents to avoid electric faults.

### 6c – Technical Assistance

Having some doubt due to equipment handling or maintenance, contact Seiler Precision Microscopes (800) 489-2282

(314) 968-2282

Fax: (314) 968-3601

e-mail: [micro@seilerinst.com](mailto:micro@seilerinst.com)

[www.seilerinst.com](http://www.seilerinst.com)

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## 7. LIFETIME WARRANTY

Except as set forth in this Limited Lifetime Warranty, Seiler Instrument Company (“SIC”) hereby warrants that each Seiler microscope product manufactured and/or sold by SIC shall be free from defects in materials and workmanship under normal use and service for the life of the product. This warranty is non-transferable and is valid only with respect to the original purchaser of the product. SIC obligation under this warranty shall be limited to repairing or replacing, at SIC facility and at SIC expense, any parts or components which are demonstrated to be defective. The purchaser shall be responsible for shipment of the product to SIC facility at 170 E. Kirkham Avenue, St. Louis MO 63119, Attention: Micro Product Department, or such other facility as SIC may otherwise designate. Under certain circumstances which are pre-approved by SIC, necessary repairs may be made at the purchaser’s facility. A return authorization is required before returning any product for warranty service by calling 1-800-489-2282 x347.

This warranty shall not apply to electronic and electrical components of the microscope or accessories such as video equipment, monitors and VCRs which carry a one (1) year warranty OR any components which are consumable or are required to be replaced or disposed of in normal use of the product, such as lamps, fiberoptic cables and rubber eyecups OR any product which was purchased prior to November 1, 2001.

This warranty shall be void and of no effect: (1) if the product is damaged due to misuse, use in a manner other than pursuant to the instruction for the use of the product, abuse, physical mishandling or natural causes such as flood, fire, earthquake or other perils, as determined by SIC, or (2) if any repairs are made by persons unauthorized by SIC to perform such services.

The warranties set forth here are in lieu of any and all other warranties expressed or implied, including, without limitation, warranties of merchantability and fitness for a particular purpose. Purchaser’s rights thereunder are granted in lieu of any other rights purchaser may have and purchaser hereby waives all other rights, warranties, remedies or guarantees whatsoever with respect to the product.

SIC shall not be liable for any reason to any third parties in respect of the product or its performance. Further, SIC shall not be liable for, and purchaser hereby releases SIC from any direct, indirect, consequential, special, incidental or punitive damages in respect to the product. In no event shall SIC be liable for any breach of warranty or other claim in an amount exceeding the purchase price of the product.

## 8 – Optional Accessories

Ask Seiler Precision Microscopes for accessories to accessorize your equipment – video systems, beam splitters, second observer system, binoculars, extensions and many others devices are available.

## 9 – Problem Solving Guide (simple problems):

Before contacting Seiler Precision Microscopes, try solving a problem as per following instructions.

| Symptom:   | Action:   |
|--|---|
| Pilot lamp does not light, nor the equipment operates:                   | <ul style="list-style-type: none"> <li>• Check if the power cable is connected to the power outlet.</li> <li>• Check if the Power Switch is at ON position.</li> <li>• Check the fuse(s). Replace it (them) if needed.</li> <li>• Check the line power.</li> <li>• Check as to overheating. The equipment can be turned on when the environmental temperature is reached.</li> </ul>  |
| Pilot lamp lights but main illumination does not light:                  | <ul style="list-style-type: none"> <li>• Check if lamp switch (at pedal) is at on position.</li> <li>• Check if the lamp connector is fully connected.</li> <li>• Check the lamp. If appearing damaged (dark or white stains), replace it.</li> </ul>   |
| Pilot lamp lights, main illumination lights but is dimmed:               | <ul style="list-style-type: none"> <li>• Check the illumination potentiometer adjustment.</li> <li>• Check if coaxial illumination device is on duty.</li> <li>• Reverse the lever.</li> <li>• Check the lamp. If appearing damaged (with dark or white stains), replace it.</li> <li>• Check if the lamp is centered and correctly set to the guide / tab.</li> <li>• Check the light conductor as for damages or for its correct setting. Adjust or replace as needed.</li> </ul> |
| Observed image (one or both eyes) is not sharp:                          | <ul style="list-style-type: none"> <li>• Check lens cleaning.</li> <li>• Check the microscope focus. Focus correctly.</li> <li>• Check dioptre adjustment from both oculars (left, and right). Adjust if needed.</li> <li>• Check the work distance between objective lens and observed object. Must be approximately the same (in millimeters) as the number engraved on the objective.<br/>Correct distance if needed.</li> </ul>   |
| There is non-stereoscopic vision:  | <ul style="list-style-type: none"> <li>• Check eyepieces interpupillary distance, on the binoculars. Adjust it as needed.</li> <li>• Arm does not move or move heavily:</li> <li>• Check the blocking button adjustment.</li> </ul>   |
| Pantographic arm does not stand still when released at desired position: | <ul style="list-style-type: none"> <li>• Check the blocking button. Adjust it.</li> <li>• Check the balance spring tension. Adjust it if needed.</li> </ul>   |

Table (magnification, observed field and illuminated field)  
# Zoom microscope #

| EYEPIECE          | OBJECTIVE LENSES |            |               |            |               |             |               |             |               |             |               |             |               |             |
|-------------------|------------------|------------|---------------|------------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|
|                   | 100              |            | 175           |            | 200           |             | 250           |             | 300           |             | 350           |             | 400           |             |
|                   | magnification    | field      | magnification | field      | magnification | field       | magnification | field       | magnification | field       | magnification | field       | magnification | field       |
| <b>10X</b>        | 5 a 30           | 33.6 a 5.6 | 2.9 a 17.1    | 58.8 a 9.8 | 2.5 a 15      | 67.2 a 11.2 | 2 a 12        | 84 a 14     | 1.7 a 10      | 101 a 16.8  | 1.4 a 8.6     | 118 a 19.6  | 1.3 a 7.5     | 134 a 22.4  |
| FOCUS 125         | 6.2 a 37.2       | 27.1 a 4.5 | 3.5 a 21.3    | 47.4 a 7.9 | 3.1 a 18.6    | 54.2 a 9    | 2.5 a 14.9    | 67.7 a 11.3 | 2.1 a 12.4    | 81.3 a 13.5 | 1.8 a 10.6    | 94.8 a 15.8 | 1.5 a 9.3     | 108 a 18.1  |
| FOCUS 155         | 6.4 a 38.4       | 26.3 a 4.4 | 3.7 a 21.9    | 45.9 a 7.7 | 3.2 a 19.2    | 52.5 a 8.7  | 2.6 a 15.4    | 65.6 a 10.9 | 2.1 a 12.8    | 78.8 a 13.1 | 1.8 a 11      | 91.9 a 15.3 | 1.6 a 9.6     | 105 a 17.5  |
| FOCUS 160         | 6.3 a 37.5       | 33.6 a 5.6 | 3.6 a 21.4    | 58.8 a 9.8 | 3.1 a 18.8    | 67.2 a 11.2 | 2.5 a 15      | 84 a 14     | 2.1 a 12.5    | 101 a 16.8  | 1.8 a 11      | 118 a 19.6  | 1.6 a 9.4     | 134 a 22.4  |
| <b>12.5X</b>      | 7.8 a 46.5       | 27.1 a 4.5 | 4.4 a 26.6    | 47.4 a 7.9 | 3.9 a 23.3    | 54.2 a 9    | 3.1 a 18.6    | 67.7 a 11.3 | 2.6 a 15.5    | 81.3 a 13.5 | 2.2 a 13.3    | 94.8 a 15.8 | 1.9 a 11.6    | 108 a 18.1  |
| FOCUS 125         | 8 a 48           | 26.3 a 4.4 | 4.6 a 27.4    | 45.9 a 7.7 | 4 a 24        | 52.5 a 8.7  | 3.2 a 19.2    | 65.6 a 10.9 | 2.7 a 16      | 78.8 a 13.1 | 2.3 a 14      | 91.9 a 15.3 | 2 a 12        | 105 a 17.5  |
| FOCUS 155         | 10 a 60          | 19 a 3.2   | 5.7 a 34.3    | 33.3 a 5.5 | 5 a 30        | 38 a 6.3    | 4 a 24        | 47.5 a 7.9  | 3.3 a 20      | 57 a 9.5    | 2.8 a 17      | 66.5 a 11.1 | 2.5 a 15      | 75 a 12.7   |
| FOCUS 160         | 12 a 74.4        | 15.3 a 2.5 | 7.1 a 42.5    | 26.8 a 4.5 | 6.2 a 37.2    | 30.6 a 5.1  | 5 a 30        | 38.3 a 6.4  | 4.1 a 24.8    | 46 a 7.7    | 3.5 a 21.3    | 53.6 a 8.9  | 3.1 a 18.6    | 61.3 a 10.2 |
| ILLUMINATED FIELD | 13 a 77          | 24.8 a 2.5 | 7.3 a 43.9    | 26 a 4.3   | 6.4 a 38.4    | 29.7 a 4.9  | 5.1 a 30.7    | 37.1 a 6.2  | 4.3 a 25.6    | 44.5 a 7.4  | 3.7 a 22      | 52 a 8.7    | 3.2 a 19      | 59.4 a 9.9  |
|                   | 28               |            | 48            |            | 55            |             | 69            |             | 83            |             | 96            |             | 110           |             |



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