

# *Evolution xRB*

Dental Microscope LED

## User's Manual



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## Installation and Assembly



1. Remove the base from the box and set base bottom up (casters facing up) on the cardboard or foam from the box for cushion.
2. Remove the base weights from the weights box and insert the weights one at a time into the bottom of the base.

Align the pins with the holes and depress the thumb lock button to put the weights into place.

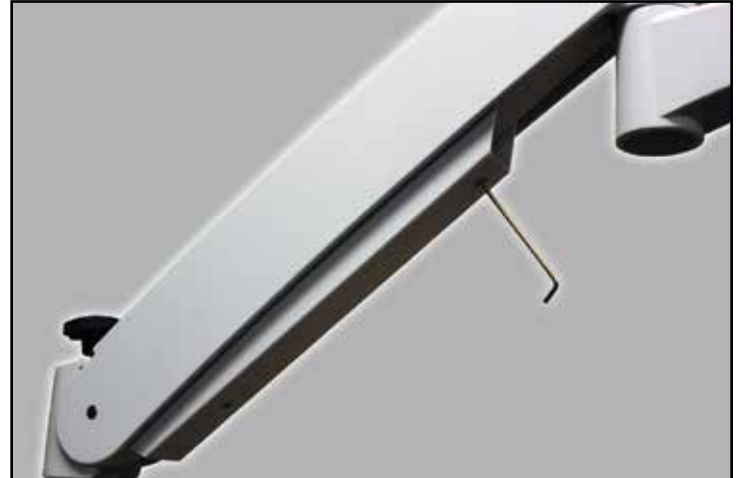
Flip the base over so that the top center post is facing upward.

*\* Be sure to check to make sure that the weights are secured before flipping the base over.*

3. Remove the pole from the packaging and insert pole into the center post hole in the base. Align the two indentation marks in the pole to the holes in the base center post hole collar.
4. Once the pole is secured into the base, insert the Light Housing/Light Source portion of the microscope into the top of the pole. This is where the illumination system is housed. Make sure that the light source is secured while inserting the light source into the pole.



Once the pole is in the collar and indentions are aligned, use the provided Allen Wrench to tighten the two Allen bolts in the base center post collar to secure the pole.



5. Next insert the Pantographic Arm into the light source.

6. Loosen the two set screws on the bottom arm cover with Allen Wrench provided.

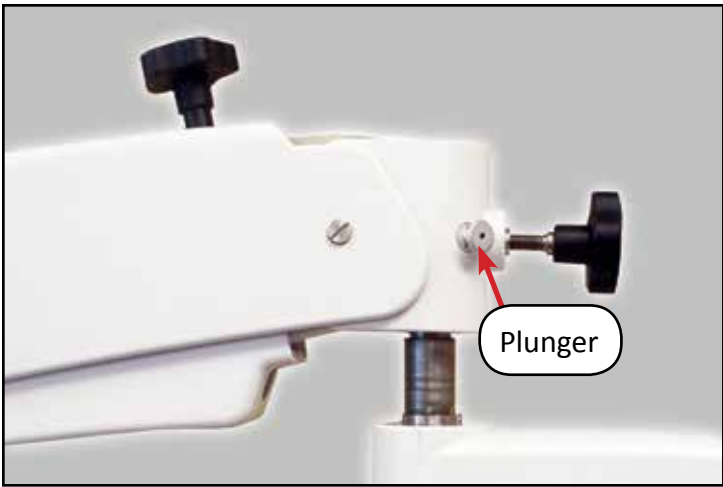


7. Remove the bottom cover.

8. Place the LED cable through the bottom cover.



9. Secure the bottom cover by tightening the set screws with the Allen Wrench.



10. After the Pantographic Arm is inserted and the LED cable is secure, add the extension piece into the top of the Pantographic Arm on the under side. Be sure to loosen the black knob and pull plunger on the Pantographic Arm in order to insert the extension arm. Screw on the white locking knob.



11. Next, insert the 45 degree coupler into the extension arm. Screw down the white locking knob.



12. Insert the Angle Arm into the 45 degree coupler. Screw down the white knob.



13. Insert the LED cable into the electrical connector on the Optical Pod. Be sure to the plug is seated completely and tighten Knurled locking ring.

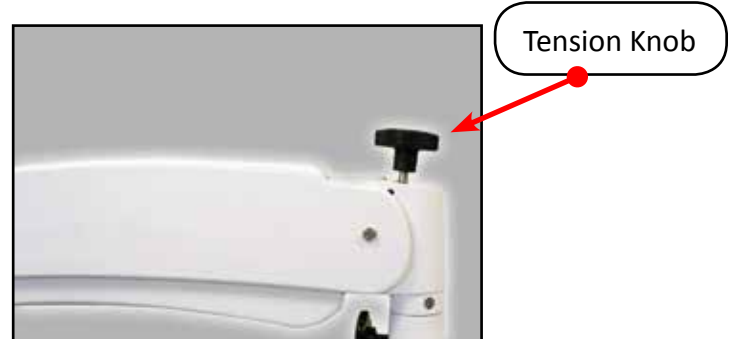


Thumb Screw

14. Secure the Binocular Head onto the Optical Pod by tightening the thumb screw.

#### PANTOGRAPHIC ARM BALANCING

NOTE: Pantographic Arm may need tension adjusted (black knob on top, turn counter-clockwise to add tension, clockwise to release tension). This may need to be done if camera/video are added to the scope. This will increase or decrease the tension to desired function for user. The Pantographic Arm may have to be in the horizontal position to make adjustments.



Tension Knob

# LED Illumination Instructions

## Symbols

### Symbols Used in this Manual or on the Device

**NOTE:** This term contains important information regarding set-up and operation to facilitate ease of use and obtain effective results.



This term contains critical information regarding safe handling and use of this system. Device malfunction or property damage could result if these instructions are not followed.



This symbol cautions that surfaces may be hot and could be a burn hazard.

**WARNING:** This term contains critical information by identifying conditions or practices that may result in injury or loss of life if these instructions are not followed.

|                |   |
|----------------|---|
| <b>Hazard</b>  | Actions To Be Taken/Prevented   |
| <b>General</b> | Read the manual in its entirety and heed all safety warnings before operating the light source.<br><br>Only qualified personnel shall inspect the unit for internal damage. |

**Warning - This device emits high intensity light that can be harmful.**



|   |  |
|---|--|
| <b>Hazard</b>                           | Actions To Be Taken/Prevented  |
| <b>Exposure to intense bright light</b> | Never look directly into the objective lens of the microscope when the unit is turned on as the light intensity can be damaging. |

**Warning - This device presents a risk of fire.**

|               |  |
|---------------|--|
| <b>Hazard</b> | Actions To Be Taken/Prevented  |
| <b>Fire</b>   | Do not operate the unit near any flammable materials including flammable gases or liquids.<br><br>If the microscope is to be cleaned with a volatile liquid (such as IPA) turn off the unit before proceeding.<br><br>After cleaning allow vapors to disperse before turning on. |



**Warning -This device presents a burn risk.**



**Hazard**

**The unit produces significant amounts of heat.**

**Actions To Be Taken/Prevented**

Always allow the unit to cool to ambient temperature before attempting any adjustments or replacement of parts.

**Warning -This device can overheat.**



**Hazard**

**Microscope overheating**

**Actions To Be Taken/Prevented**

Do not block air inlets or outlets (vents) with anything including plastic protection covers.

If the microscope overheats it will turn the light off. If this happens, turn off the unit and allow sufficient time for the unit to cool (approx. 10 minutes) then turn the unit back on.

If the light still remains off, turn off the unit and allow more time for cooling.

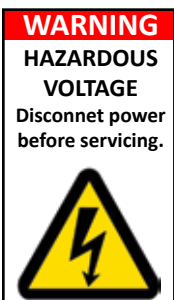


Vent



Vent

**Warning - This device presents a risk of electrical shock.**



**Hazard**

**This device operates at high electrical currents (>10A)**

**Actions To Be Taken/Prevented**

Only qualified personnel shall inspect the unit for internal damage. Only operate the equipment in a professional manner as set forth in this manual.

Do not remove interior components from the power supply with the unit connected to wall outlet.

**Warning - The internal components of this device can be damaged.**



**Hazard**

Unqualified personnel can create hazardous conditions and cause damage to internal components.

**Actions To Be Taken/Prevented**

Only operate the equipment in a professional manner as set forth in this manual.

Only employ authorized and properly trained personnel to perform maintenance functions.

**Warning -This device emits electromagnetic energy which may be harmful.**

**Hazard**



**This equipment has passed testing for EMI/RFI radiation and susceptibility; however, if not installed and used in accordance with the instructions, interference to other devices in the near vicinity may occur.**

**Electromagnetic energy can travel through the power cord or through radio transmission.**

**Actions To Be Taken/Prevented**

Select an appropriate location for the unit.

Ensure there is adequate separation distance between the unit and any device that may be affected by the electromagnetic energy coming from the unit.

Power the illuminator from a separate AC mains circuit that does not have a device connected that could be affected by the electromagnetic energy coming from the illuminator.

## **Equipment Classifications**

**Type of protection against electric shock**

**Class I**

**Degree of protection against ingress of water**

**IPX0**

**Degree of safety of application in the presence of flammable mixtures.**

**Equipment not suitable for use in the presence of flammable mixtures.**

**Mode of operation:**

**Continuous operation**

## Overview

The P1026 product is an LED illumination system integrated into a Seiler surgical microscope. The power supply for the system is mounted between the vertical post and microscope swivel arm and is connected via a heavy duty custom interface cable.



Photo above shows power supply module with interface cable.



Photo above shows rear view of the microscope and the electrical connector.

## Controls

The On/Off control for the system is located on the front face of the power supply, which is mounted on the post end of the swivel arm.

Light output intensity is controlled by a knob located on top of the microscope.



Photo above shows microscope light intensity control.

## Cooling

The microscope unit contains a fan system that utilizes an air inlet located on the rear panel above the power connector and outlet side vents to provide cooling for the LED illuminator. The large electrical connector located on the microscope unit provides power from the power supply for the illumination and cooling systems.

**Caution:** The cooling intake by the rear connector and the vents on either side of the microscope must not be blocked or restricted. Overheating may occur.



Photo above shows cooling vents on the filter control side.



Photo above shows rear cooling intake port.

**12 volt Auxiliary power jack and Main ON/OFF indicator**

The front panel of the power supply contains the main power On/Off push button switch and a barrel plug connector power jack output for operating a camera.

The max output power is 12 vdc @ 500mA.  
The barrel plug is center pin positive.



*Above photo shows the 12 vdc output connection and On/Off button*

## Set Up

**Unpack**

Carefully unpack all components. If necessary, the unit can be cleaned with isopropyl alcohol and a soft cloth. Inspect all components for any signs of damage that may have occurred during shipping.

If shipping damage is suspected, notify Seiler or your authorized Seiler dealer immediately.

**Connect the Power Cord**

Plug the power cord into a wall receptacle. The system features universal power input range of 90 - 240 vac / 50-60 Hz

If the unit should malfunction, and this troubleshooting matrix does not correct the problem, then contact technical assistance.

|                                     |   |
|-------------------------------------|---|
| <b>Console Won't Power Up</b>       | CHECK ..... AC power and that cord is plugged in.<br>CHECK ..... Fuses are installed and in good order.<br>CHECK ..... On/Off switch on front panel is 'ON'.<br>CHECK ..... If air vents are blocked or fans are not operating then the over-temperature thermal circuit will turn off the LED. Correct the blockage and turn off the LED power supply for 10 minutes to allow the LED to cool, then retry. If it still will not illuminate wait for a longer period of time before turning on the power. |
| <b>Temperature High or Exceeded</b> | CHECK..... Ambient air temp is too high, improve air<br>CHECK..... Air vents blocked or restricted.   |
| <b>Replacing the Fuses</b>          | Use only the fuses rated as marked on the rear panel.<br><br>Replace the fuses as follows:<br>1. Disconnect the device from the main power supply.<br>2. Retract fuse holder drawer on mains jack.<br>3. Measure resistance of each fuse, and replace as necessary.<br>4. Close fuse holder drawer.<br>5. Re-attach mains power cable.  |
| <b>Cleaning</b>                     | Exterior surface cleaning with window cleaner.<br>Do not attempt to clean any internal components.  |

## Specifications

|                              |                                   |
|------------------------------|-----------------------------------|
| <b>Mains Cable / Jack</b>    | 10 Amp /250 VAC IEC 320/C13       |
| <b>Power Supply</b>          | 90-264 VAC, 47/63 Hz, 2.0A@115VAC |
| <b>Fuses</b>                 | 5x20mm 3A 250V                    |
| <b>ANSI/UL</b>               | 61010-1                           |
| <b>CAN/CSA</b>               | C22.2 Number 61010-1              |
| <b>CENELEC</b>               | EN 61326-1:2006                   |
| <b>Rated Life (LED)</b>      | 40,000 Hours                      |
| <b>LED Power Consumption</b> | 35 Watts                          |

## Environmental Limitations

|                   | Operating Limits              | Storage Limits                 |
|-------------------|-------------------------------|--------------------------------|
| Temperature       | 10° to 25° C<br>(50° to 77°F) | 0° to +50° C<br>(32° to 122°F) |
| Relative Humidity | 30% to 75%                    | 0% to 100%<br>(Non-Condensing) |
| Air Pressure      | T700 hPa to 1060 hPa          | Same                           |

### **Limited Guarantee / Warranty**

Seiler Instrument warrants this product to be free from defect in material and workmanship for a period of 12 months following original purchase. The warranty excludes lamps, lamp sockets, and any other items that have been misused, neglected, damaged, altered, or used in any manner inconsistent with the instructions in this manual.

Seiler Instrument's obligations under this warranty are limited to the repair, replacement, or reimbursement of the product only, and, in no event, is Seiler Instrument liable for any consequential or special damages, or costs related to the transportation, installation, or any other costs related to a warranted product.

# Interpupillary Distance Adjustment

Looking through the eyepieces on the binocular head, adjust the Interpupillary distance as shown in the image below, until the end user is the Field of View in one single image.



0-220° BINOCULAR MICROSCOPE HEAD



0-180° STRAIGHT/FIXED BINOCULAR MICROSCOPE HEAD

# Parfocalizing

STEPS:

Set both eyepieces at 0

Take a piece of paper and draw an "X" on it. Place that piece of paper onto a flat area at the recommended focal length (10" with 250mm, 12" with 300mm objective). Adjust the eyepiece until you get a single solid image.

Set the scope to the highest power and position the scope to where the "X" is as sharp as possible.

Then go to the lowest power without moving the microscope's physical position and one eye at a time focus the eyepieces.

Look through the scope and focus on the "X" and change the magnification levels to make sure each setting stays in focus. If the scope goes out of focus start the process over again.

Once the image is clear in both eyes, this completes the Parfocalizing Process.

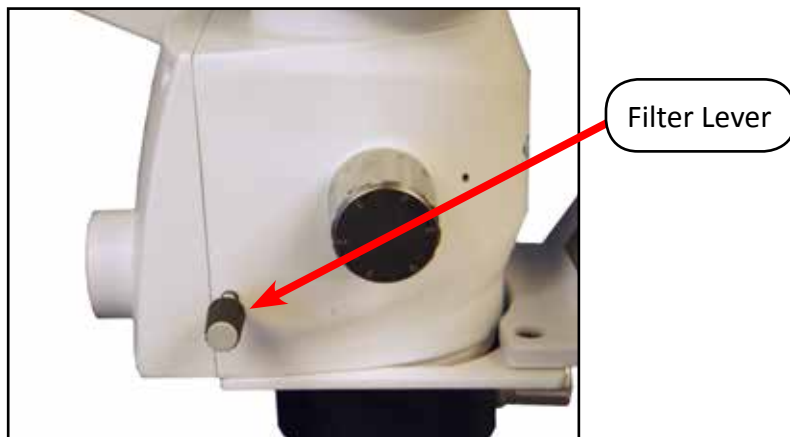
# Evolution xR6 Magnification Chart

|                   |                    | OBJECTIVE LENS |       |               |       |               |       |               |       |               |       |               |       |               |       |               |       |       |       |        |        |
|-------------------|--------------------|----------------|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|-------|-------|--------|--------|
|                   |                    | 175            |       |               |       | 200           |       |               |       | 250           |       |               |       | 300           |       |               |       | 400   |       |        |        |
| eyepiece          | position of button | magnification  | field | magnification | field | magnification | field | magnification | field | magnification | field | magnification | field | magnification | field | magnification | field |       |       |        |        |
| 10x/18mm          | 1 (0.4x)           | 3.08           | 3.88  | 58.44         | 46.39 | 2.70          | 3.40  | 66.67         | 52.94 | 2.16          | 2.72  | 83.33         | 66.18 | 1.80          | 2.27  | 100.00        | 79.41 | 1.35  | 1.70  | 133.50 | 105.88 |
|                   | 2 (0.6x)           | 4.62           | 5.82  | 39.00         | 31.00 | 4.05          | 5.10  | 44.45         | 35.30 | 3.24          | 4.08  | 55.55         | 44.10 | 2.70          | 3.40  | 66.70         | 53.00 | 2.02  | 2.55  | 89.10  | 70.60  |
|                   | 3 (0.78x)          | 6.01           | 7.57  | 29.95         | 23.79 | 5.27          | 6.63  | 34.19         | 27.15 | 4.21          | 5.30  | 42.75         | 33.96 | 3.51          | 4.42  | 51.28         | 40.80 | 2.63  | 3.32  | 68.44  | 54.30  |
|                   | 4 (1.28x)          | 9.86           | 12.42 | 18.26         | 14.50 | 8.64          | 10.88 | 20.83         | 16.54 | 6.91          | 8.70  | 26.05         | 20.69 | 5.76          | 7.25  | 31.25         | 24.83 | 4.31  | 5.44  | 41.76  | 33.09  |
|                   | 5 (1.6x)           | 12.32          | 15.52 | 14.60         | 11.60 | 10.80         | 13.60 | 16.66         | 13.25 | 8.64          | 10.88 | 20.85         | 16.70 | 7.20          | 9.06  | 25.00         | 19.90 | 5.40  | 6.80  | 33.40  | 26.50  |
|                   | 6 (2.5x)           | 19.25          | 24.25 | 9.35          | 7.42  | 16.88         | 21.25 | 10.67         | 8.47  | 13.50         | 17.00 | 13.33         | 10.59 | 11.25         | 14.17 | 16.00         | 12.70 | 8.42  | 10.63 | 21.38  | 16.94  |
| 12.5x/18mm        | 1 (0.4x)           | 3.85           | 4.85  | 58.44         | 46.39 | 3.37          | 4.25  | 66.70         | 52.95 | 2.70          | 3.40  | 83.33         | 66.18 | 2.25          | 2.83  | 100.00        | 79.50 | 1.69  | 2.13  | 133.50 | 105.60 |
|                   | 2 (0.6x)           | 5.78           | 7.28  | 39.00         | 31.00 | 5.06          | 6.38  | 44.45         | 35.30 | 4.05          | 5.10  | 55.55         | 44.10 | 3.38          | 4.25  | 66.70         | 53.00 | 2.53  | 3.20  | 90.00  | 70.50  |
|                   | 3 (0.78x)          | 7.51           | 9.46  | 29.96         | 23.79 | 6.58          | 8.29  | 34.20         | 24.14 | 5.27          | 6.63  | 42.70         | 33.95 | 4.39          | 5.53  | 51.25         | 40.72 | 3.29  | 4.16  | 68.40  | 54.09  |
|                   | 4 (1.28x)          | 12.33          | 15.52 | 18.25         | 14.50 | 10.79         | 13.61 | 20.85         | 16.53 | 8.64          | 10.88 | 26.05         | 20.68 | 7.21          | 9.07  | 31.20         | 24.82 | 5.40  | 6.83  | 41.70  | 32.96  |
|                   | 5 (1.6x)           | 15.40          | 19.40 | 14.60         | 11.60 | 13.50         | 17.00 | 16.66         | 13.25 | 10.80         | 13.60 | 20.85         | 16.55 | 9.00          | 11.32 | 25.00         | 19.90 | 6.74  | 8.50  | 33.40  | 26.50  |
|                   | 6 (2.5x)           | 24.06          | 30.31 | 9.35          | 7.42  | 21.08         | 26.58 | 10.67         | 8.47  | 16.88         | 21.25 | 13.33         | 10.59 | 14.08         | 17.71 | 15.98         | 12.70 | 10.54 | 13.33 | 21.35  | 16.88  |
| 16x/16mm          | 1 (0.4x)           | 4.93           | 6.21  | 51.95         | 41.24 | 4.32          | 5.44  | 59.26         | 47.06 | 3.47          | 4.35  | 73.80         | 58.90 | 2.88          | 3.62  | 88.89         | 70.72 | 2.16  | 2.73  | 118.60 | 93.77  |
|                   | 2 (0.6x)           | 7.40           | 9.31  | 34.65         | 27.50 | 6.48          | 8.16  | 39.50         | 31.40 | 5.20          | 6.52  | 49.40         | 39.20 | 4.32          | 5.43  | 59.25         | 47.15 | 3.24  | 4.10  | 79.00  | 62.75  |
|                   | 3 (0.78x)          | 9.62           | 12.11 | 26.62         | 21.15 | 8.42          | 10.61 | 30.40         | 24.13 | 6.76          | 8.48  | 37.87         | 30.20 | 5.62          | 7.06  | 45.58         | 36.27 | 4.21  | 5.33  | 60.80  | 48.03  |
|                   | 4 (1.28x)          | 15.78          | 19.87 | 16.23         | 12.88 | 13.82         | 14.41 | 18.52         | 14.71 | 11.09         | 13.91 | 23.08         | 18.40 | 9.22          | 11.58 | 27.78         | 22.10 | 6.91  | 8.75  | 37.10  | 29.27  |
|                   | 5 (1.6x)           | 19.70          | 24.83 | 13.00         | 10.30 | 17.28         | 21.76 | 14.80         | 11.75 | 13.82         | 17.40 | 18.55         | 14.70 | 11.52         | 14.50 | 22.25         | 17.70 | 8.63  | 10.90 | 29.70  | 23.50  |
|                   | 6 (2.5x)           | 30.80          | 38.80 | 8.31          | 6.60  | 27.00         | 34.00 | 9.48          | 7.53  | 21.67         | 27.17 | 11.82         | 9.42  | 18.00         | 22.63 | 14.22         | 11.31 | 13.50 | 17.08 | 17.00  | 14.99  |
| 20x/12mm          | 1 (0.4x)           | 6.16           | 7.76  | 38.96         | 30.93 | 5.40          | 6.80  | 44.44         | 35.29 | 4.32          | 5.44  | 55.56         | 44.12 | 3.60          | 4.53  | 66.67         | 52.98 | 2.69  | 3.40  | 89.25  | 70.59  |
|                   | 2 (0.6x)           | 9.24           | 11.64 | 26.00         | 20.65 | 8.10          | 10.20 | 29.60         | 23.50 | 6.48          | 8.16  | 37.05         | 29.45 | 5.40          | 6.80  | 44.45         | 35.35 | 4.04  | 5.10  | 59.40  | 47.05  |
|                   | 3 (0.78x)          | 12.02          | 15.13 | 19.97         | 15.86 | 10.53         | 13.26 | 22.79         | 18.10 | 8.42          | 10.61 | 28.50         | 22.62 | 7.02          | 8.85  | 34.19         | 27.15 | 5.25  | 6.63  | 45.71  | 36.20  |
|                   | 4 (1.28x)          | 19.72          | 24.83 | 12.17         | 9.67  | 17.28         | 21.76 | 13.89         | 11.03 | 13.82         | 17.41 | 17.37         | 13.80 | 11.52         | 14.51 | 20.83         | 16.54 | 8.62  | 10.88 | 27.85  | 22.06  |
|                   | 5 (1.6x)           | 24.64          | 31.04 | 9.75          | 7.70  | 21.60         | 27.20 | 11.10         | 8.80  | 17.28         | 21.76 | 13.90         | 11.05 | 14.40         | 18.10 | 16.70         | 13.25 | 10.80 | 13.60 | 22.30  | 17.65  |
|                   | 6 (2.5x)           | 38.50          | 48.50 | 6.23          | 4.95  | 33.75         | 42.50 | 7.11          | 5.65  | 27.00         | 34.00 | 8.99          | 7.06  | 22.50         | 28.33 | 10.67         | 8.47  | 16.83 | 21.25 | 14.26  | 11.30  |
| illuminated field |                    | 59             |       |               |       | 68            |       |               |       | 85            |       |               |       | 101           |       |               |       | 136   |       |        |        |



## The Color Filter and Cleaning

There is a lever installed on the side of the microscope body to put in front of the lamp luminous flux an orange and green filter.



### Cleaning

The objective, placed in front of the field under clinical or surgical treatment, is exposed to blood and topical medicine spots, etc. The spots dim the passage of the light, with loss of brightness in the optical observation.

Alcohol or ether applied with a clean cotton swab can be used to remove all smudges. Use a soft CIRCULAR movement. Use your laboratory's prescribe procedures to remove blood stains or other contaminants from your equipment.

If the objective is blotched too much, change the cotton swab in each circular friction, avoiding spreading again the impurities.

The Objective lens can be protected by use of an objective protector (6132000). It is placed under pressure in the external margin of the objective lens and protects it against eventual blows of the surgical tools and against contamination.

The metallic parts (chrome-plated or painted) are cleaned with cotton, alcohol and ether.

### Lubrication

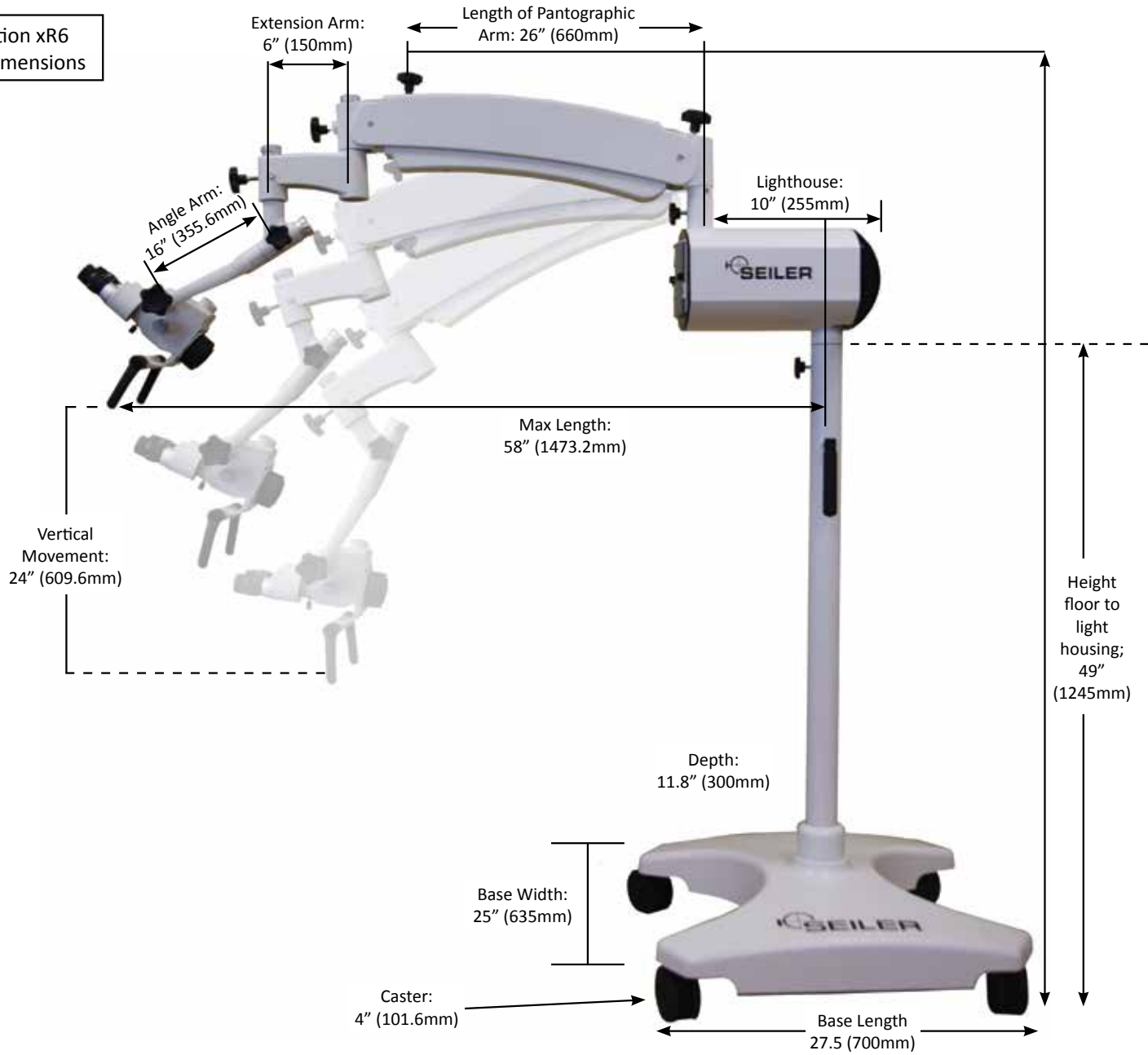
After some years of use we recommend lubrication of the "dovetail", the sliding orthogonal rules for X-Y translation. Apply here, with a cotton swab a delicate oil film.

Do not exaggerate the lubrication. It is self-defeating, and if the microscope is operated inclined to the front, for sure the oil excess will come out through the front.

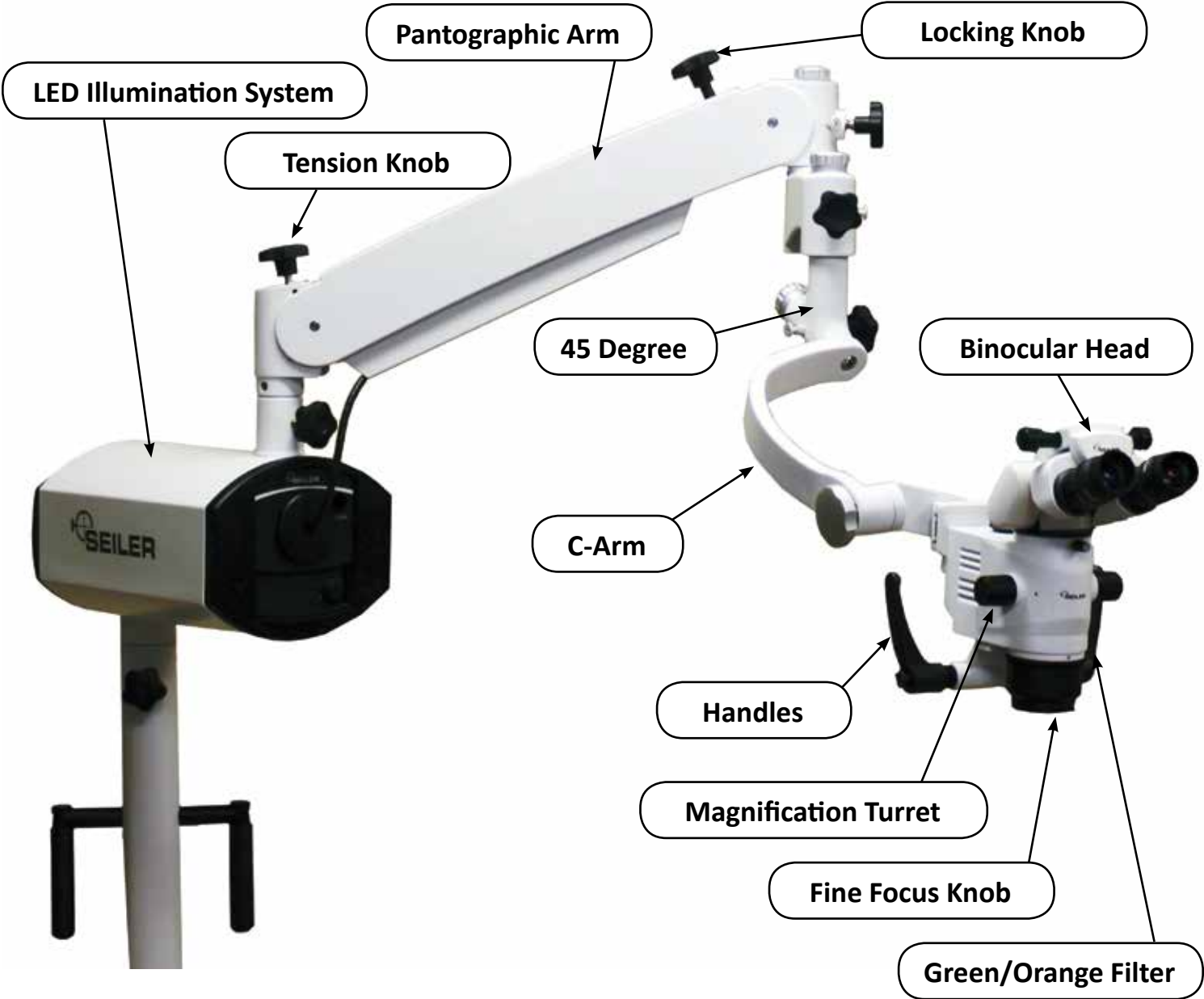
For lubrication use light film of mineral oil.

# Dimensions

Evolution xR6  
Floor Dimensions



# Parts Breakdown



## GENERAL SPECIFIC DETAILS

|                                       |                  | Evolution xR6 |          |
|---------------------------------------|------------------|---------------|----------|
| Vertical Optical Working Distance     | Minimum Possible | 175 mm        | 6.89 in  |
|                                       | Maximum Possible | 400 mm        | 15.75 in |
| Microfocus vertical adjustment range: |                  | 13mm          |          |
| * Microscope Weight (Floor Model):    |                  | 255 lbs       | 116 kg   |
| * Including Packaging                 |                  | (3 boxes)     |          |

## ELECTRICAL DETAILS

|                       |  |
|-----------------------|--|
| Power Supply          | 90 – 264VAC – automatic selection Power supply |
| Auxillary Power Jack: | 12vDC – 2.1mm female connector – 500ma Rating  |
| Fuses:                | 3amp – 5x20mm Cylindrical Slo-Blo – 250VAC     |
| Illumination Bulb:    | LED  |

## OPTICAL DETAILS

|                  | Standard Setup     | Optional Setup     |
|------------------|--------------------|--------------------|
| Objective Lens   | $f = 250\text{mm}$ | 175 – 400 mm       |
| Eyepieces        | 10x                | 12.5x, 16x, 20x    |
| Diopter Setting  | -6 to +6           | NA                 |
| Field of vision: | 9 – 72 mm          | * 4.95 – 105.88 mm |

## MAGNIFICATION TURRET DRUM AT STANDARD 250MM:

|               |                                  |                                      |
|---------------|----------------------------------|--------------------------------------|
| Evolution xR6 | 2.3x, 3.2x, 5x, 8.2x, 12.8x, 19x | ** Max low: 1.70x – Max High: 48.50x |
|---------------|----------------------------------|--------------------------------------|

\* Depends on Eyepieces and Objective Lens

\*\* Max low refers to the lowest power able to be achieved by combination of eyepiece and objective lens magnification. Max High is the maximum power able to be achieved through combination of eyepiece and objective lens magnification.





We are here to serve you!

If you have any questions regarding Seiler's products or services, please feel free to contact us.

Toll-Free: 800.489.2282

Local: 314.968.2282

Fax: 314.968.3601

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

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

- Microscope Division Manager

Dane Carlson

ext. 365 • [dcarlson@seilerinst.com](mailto:dcarlson@seilerinst.com)

- Corporate Marketing/Sales Representative

Nicole Rasch

ext. 345 • [nrasch@seilerinst.com](mailto:nrasch@seilerinst.com)

- Technical Product Information

Tony Leise

ext. 363 • [tleise@seilerinst.com](mailto:tleise@seilerinst.com)

- Bulb Order Information

Sandra Jeremich

ext. 336 • [sjeremich@seilerinst.com](mailto:sjeremich@seilerinst.com)



3433 Tree Court Industrial Blvd.

St. Louis, Missouri 63122

Toll Free: (800) 489-2282

Local: (314) 968-2282

Email: [micro@seilerinst.com](mailto:micro@seilerinst.com)

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