



Precision SurgioScope

*Portable surgical microscope for small animal surgery
Binocular (PSMB) and Trinocular (PSMT)*

www.wpiinc.com

INSTRUCTION MANUAL

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General Description

SurgioScope (**Fig.1**) is a portable high quality surgical microscope offering outstanding image quality. Incorporating an agile extension arm and excellent working distance objectives, SurgioScope provides convenient movement and

Fig. 1



maneuverability necessary for accurate positioning. These important features, together with a high quality optical system, provide sharp image contrast and enhanced large field of vision. The SurgioScope comes fully equipped with a foot-controlled motorized focusing system normally only found in surgical microscopes costing substantially more. A unique dual lamp housing enables safe and rapid changing of the lamp during an operation, without the need to power down. The optional video port permits operational procedures to be monitored or recorded simultaneously using a video recorder or camera.

A spring balance system is designed for the arm so that the microscope can move upwards and downwards stopping at any designed position. The adjusting functions of the equipment includes magnification, focusing and inclination.



Precision SurgioScope

SurgioScope Specifications

Total Magnification..... 4.3x - 12x
 Adjustable Range of Diopter \pm 6 Diopter
 Adjustable Range of Interpupillary Distance min. 50 mm - max. 70 mm
 Working Distance 190 mm - 240 mm

LENS CHARACTERISTICS

Eyepiece	Objectives (mag.)	Objective	Total Magnification
		Focal Distance	
12.5x	F200 (1.0X)	200 mm	5.3x, 8x, 12x
	F250 (0.8X) <i>optional</i>	250 mm	4.3x, 6.4x, 9.6x
	F300 (0.67X) <i>optional</i>	300 mm	3.5x, 5.3x, 8x
	F350 (0.57X) <i>optional</i>	350 mm	3x, 4.6x, 6.8x

Adjustable Range of
 Fine Focus Adjustment..... 30 mm
 Illumination internal coaxial optic fiber cable
 Halogen-Tungsten Lamp 12V, 100W, with cold reflection
 Power..... 110V, 50-60 Hz, or 220V, 50-60 Hz
 Optional Camera 1/2-inch CCD camera recommend
 Shipping Weight 70 lbs (33 kg)
 Controlling Range of the Microscope
 Max. Stretch Radius of Microscope Arm..... 870 mm
 Vertical Movement Range 700~1100 mm
 Adjustable Range of Small Arm 30 mm



Illumination

The lamp housing holds two halogen lamps (12 V, 100 W); while one is in use, the other is a quick-change spare. Illumination is delivered to the specimen by internal coaxial fiber optic cable. The light intensity can be adjusted continuously according to user's requirement. Two types of voltage supplies are available for this microscope: AC110 V, 50 Hz or AC 220 V ($\pm 10\%$).



SurgioScope Assembly

Attaching post to base

Lay the floor stand on the ground. Turn out the inner hexagonal bolt and gasket at the end of the post, insert the post into the hole of the floor stand, turn the post to make the post pin on the base support clip into the groove on the end of post, assemble in order the unassembled gasket, spring gasket, inner hexagonal bolt, then fasten firmly with the 10 mm hexagonal wrench .

Attaching power supply box to post

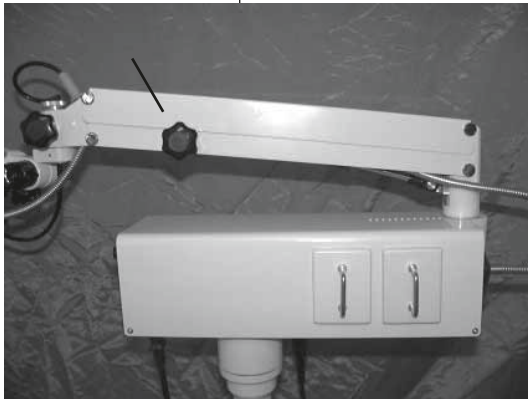


Fig. 2a

The SurgioScope is packaged so as not to allow the rotation of the arm. Carefully lift the power supply box from the shipping container. Knob (**Fig. 2a-1**) must remain tightened to prevent the arm from springing up and injuring the user putting the microscope together. Insert shaft under the power supply box into the post (**Fig. 2b**), insert the inner hexagonal tightening bolt into the groove of the post (**Fig. 2c**), fasten firmly.



Fig. 2b



Fig. 2c



Attaching microscope head to arm

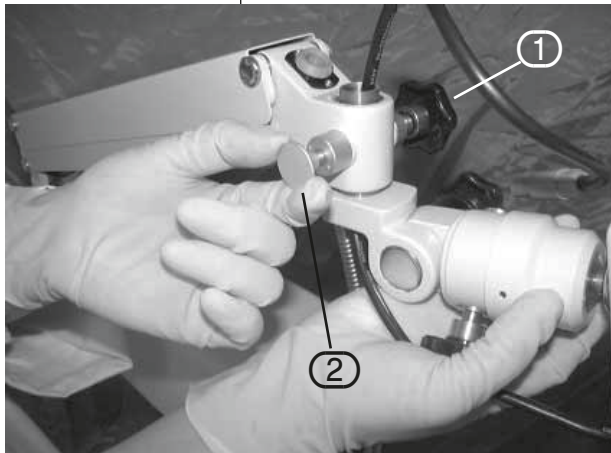


Fig. 3a

Make sure that the end of the bolt (**Fig. 3a-1**) does not protrude out of the hole surface. Remove the fixing nut (**Fig. 3b-1**). Pull out the safety pin (**Fig. 3a-2**) with one hand, while holding the connecting part of microscope with another hand. Insert the shaft into the hole of the arm from bottom to top. Then release the safety pin (**Fig. 3a-2**), and make sure that the spring goes back into the groove on the shaft. Fasten the fixing nuts (**Fig. 3a-1** & **Fig. 3b-1**). Insert the 7-pin plug (**Fig. 3c-1**) into the 7-pin socket.

Fig. 3c

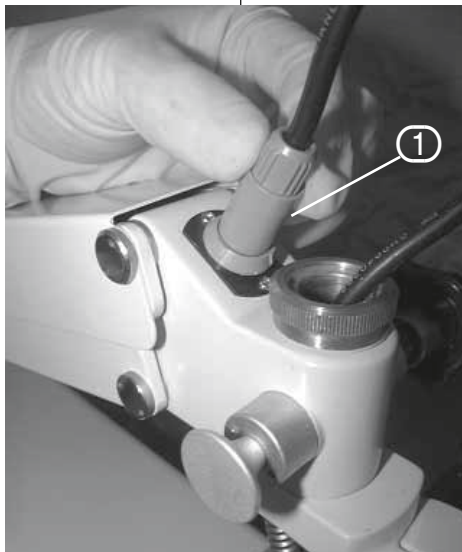


Fig. 3b



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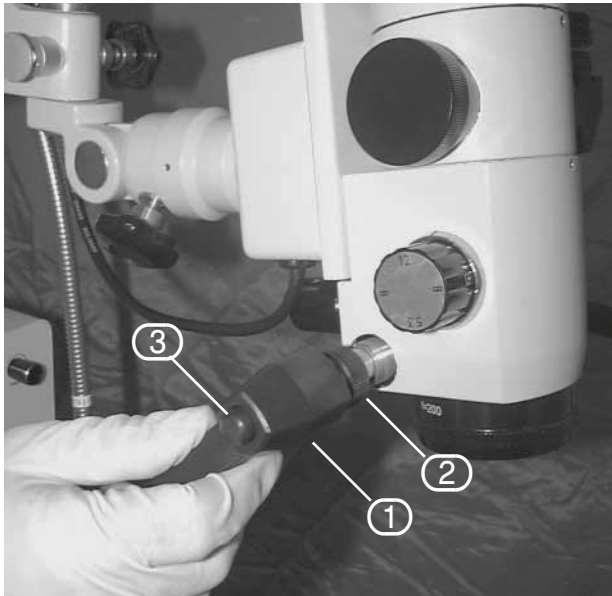


Fig. 4

Attaching handles

Insert the manipulating handle (**Fig. 4-1**) into the holes on the both sides of the microscope. Tighten the screw to fix the manipulating handle (**Fig. 4-2**) to the microscope. To change the handle position, press the locker (**Fig.4-3**) in, turn the handle to the right position, then release the locker to fix the handle position.

Attaching fiber optic cable

Insert one end of the optical fiber (**Fig. 5a**) into the connector at the back of the lamp housing and another end into the connector behind the microscope (**Fig. 5b**).



Fig. 5a

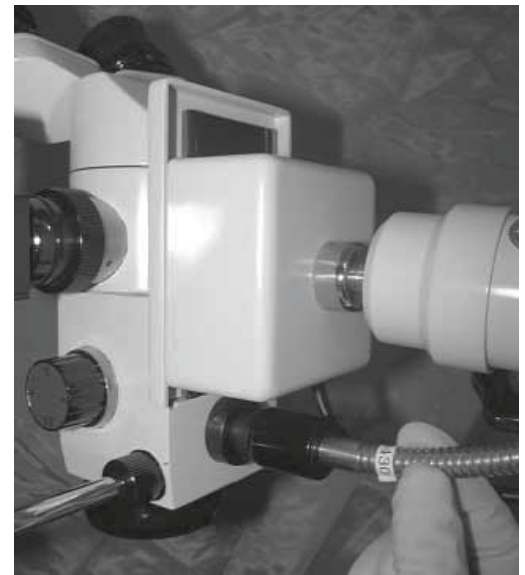
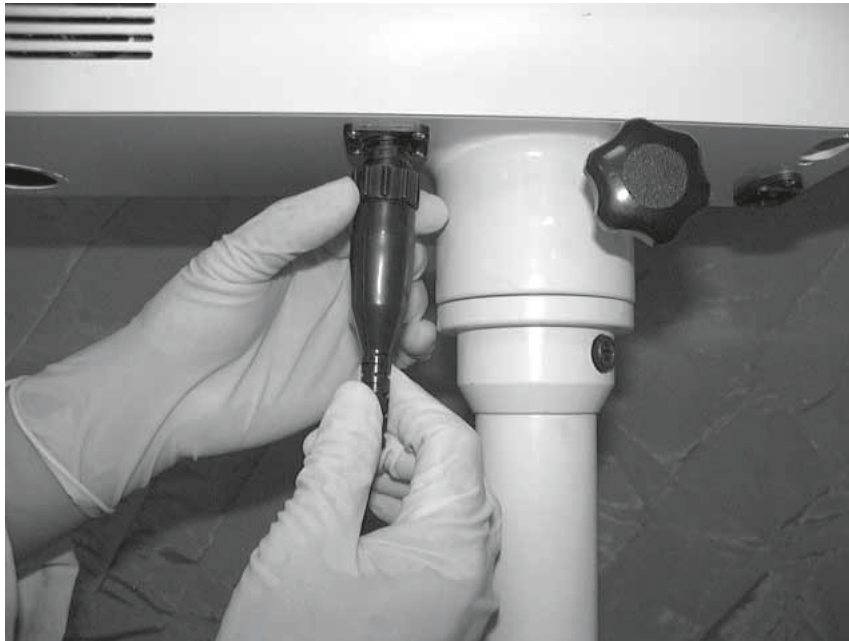


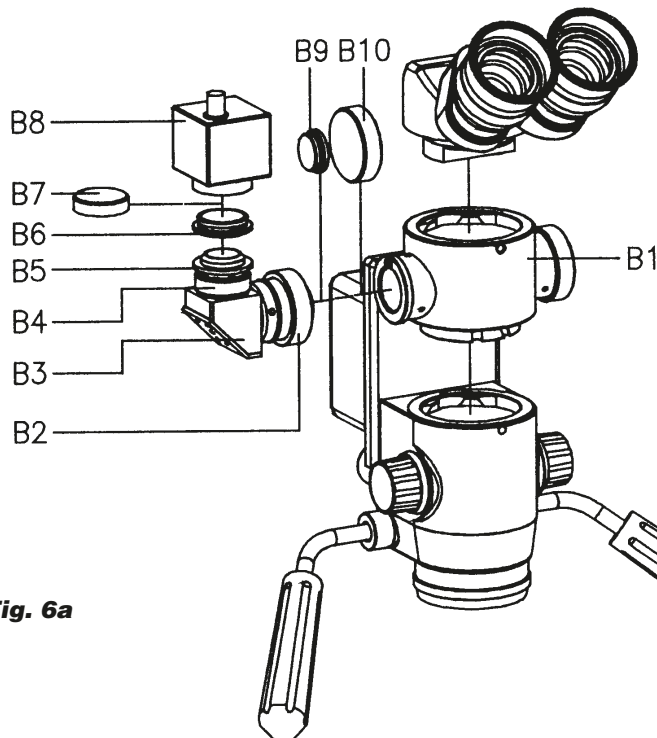
Fig. 5b



Attaching foot switch

Connect the 5-pin plug on the foot switch to the 5-pin socket located under the lamp house (Fig. 6).

Fig. 6



Assembly of Beam splitter, C-mount and Camera

- B1** Beam splitter
- B2** Screw Flange
- B3** CCD adaptor (C-mount Coupler)
- B4** focus adjusting ring B5 Screw Flange
- B6** CCD connector
- B7** Dust proof cover
- B8** CCD Camera without 5mm extension ring
- B9** dust proof cover
- B10** dust proof cover

Fig. 6a



Loosen the front setscrew below the binocular headpiece and carefully remove the binocular headpiece.

Place the beam splitter in the aperture and tighten the setscrew.

Place the binocular headpiece into the beam splitter and tighten the setscrew on the beam splitter.

Remove the dust cover cap **B10** from left or right side of the beam splitter and store in a clean location.

The C-mount is optically tuned to one side or the other of the beam splitter.

Place C-mount Coupler **B3** into the beam splitter and turn ring **B2** to tighten into place. Please note that the orientation, (rotation) of the C-mount Coupler is key mounted in the same direction as the top of the microscope.

Remove dust caps **B7** and **B9** from the C-mount Coupler **B3**.

Remove the lens cover cap from the camera.

Remove the 5mm extension ring from the CCD camera and screw the camera onto connector **B6**, while lowering Flange **B5** a slight amount to allow the camera to fully seat onto connector **B6** and still be free to turn.

Care must be taken not to over tighten these connections as they become very difficult to remove.

When the camera is oriented properly then flange **B5** can be raised to lock the camera rotation.

Adjustments may need to be made to the dynamic balance of the pantographic arm depending on the mass of the camera, beam splitter and c-mount. The coaxial video cable and power cable for the camera may be routed through the pantographic arm next to the fiber optic cable to keep them out of the working area. An extension cord and a covering sheath may be necessary to protect the power cable from damage.

Camera Operation and Setup

Set up a test subject and focus on it through the eyepieces. Turn on the camera and monitor then adjust the Focus Control **B4** until a sharp image is seen on the monitor. If the camera cannot be focused, check for the presence of the 5 mm



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extension ring, it should not be attached. This microscope is configured to use what is known technically as a “CS-mount” that does not use the 5 mm extension included with the camera. A “C-mount” trinocular configuration does use this extension.

If the center of the image is off, verify that the correct side of the beam splitter is being used. The flat side of the C-mount adaptor **B3** has a number of adjusting screws to center the image reflected off the internal mirror. These adjustments have been made at the factory and should not be modified by the user. If necessary, the beam splitter and the C-mount may need to be returned to the factory for adjustment.

Note: With the Wide Field Video Option, a tradeoff was made to allow for the video to image a larger field of view and because of this some vignetting may occur. In addition the internal lamp may not illuminate the entire field that can be imaged by the camera and monitor.



Operation of the SurgioScope

NOTE: *Before operating the SurgioScope, check if the position of the voltage switch (on the bottom of the power supply box) corresponds to your input voltage.*

First, choose a working distance according to the requirements of the surgical microscope. The SurgioScope is usually supplied with the F200 objective installed. This objective can be easily unscrewed and replaced with another of the optional objectives.

The manipulating handles can be removed and sterilized if necessary in accordance with the procedure's protocols. Reassembly of these components may occur at the time of use.

The rubber eyepiece covers should be folded down if the user is wearing glasses. Otherwise, contact between glasses and eyepiece covers may jar the microscope and make the image unsteady.

Adjust the diopter to the zero graduation. To adjust the focus, move the fine focusing drag to the starting position by foot switch, where the fine focusing indicator points to the central point of the drive. Loosen the knob (**Fig. 2a-1**) at the middle of the arm and move the microscope up and down to adjust the focus. Normally, for F200 objective, the objective should be above 200 mm from the working surface. Tighten the knob (**Fig. 2a-1**), adjust the fine focusing by foot switch, while observing with one eye, until the image in this eyepiece is clearest. Next adjust the diopter of this eyepiece until the image is sharpest. Then adjust the diopter of the other eyepiece (so each eyepiece gives a clear image individually).

Now observe the image with both eyes at once. Adjust the interpupillary distance so that the images merge and a stereoscopic effect is achieved.

When photographing, adjust the eyepiece diopter to see sharply the reticle, and move the microscope until the object is seen clearly. Then a photograph can be taken.



Maintenance

Replacing the bulbs



Fig. 7

The lamp housing is equipped with a spare bulb module. In case the bulb burns out during operation, turn off power switch and pull out the bulb module (**Fig. 7**). Replace it with the spare bulb module, switch power on and continue the operation.

After operation, replace the burned-out bulb immediately to prepare the microscope for its next use (replace lamp with WPI **#500162**). While replacing, pull out ceramic socket and take the bulb out of the two clamping springs when the bulb cools down. Replacement bulb is installed in reverse order.

Replacing the fuse

Remove the fuse holder under the power supply box. Replace with a new fuse, then fasten the cover. Caution: Only use fuses of the same type of specification and rated value (AC250, 1.25A, slow-blow fuse; AC125, 2.5A, slow-blow fuse). For

safety, please disconnect power before removing the lower cover and replacing the fuse.

Balance setting

The balance setting of this instrument has been checked and adjusted before leaving the factory. No further adjustment should be necessitated during the surgical procedures.

General information

The PSM should not be placed in a dusty, moist or corrosive environment. Lenses should be carefully maintained. If dust is present on a lens, remove with clean, dry and oil-free compressed air. Clean grease and water stains with a drop of lens cleaning fluid. The accessories not being utilized should be stored in a sealed box with an appropriated desiccant.



Supplies and Tools

Sterile covers for fixation screw (4)

Sterile covers for magnification adjustment (2)

Sterile covers for manipulating handles (2)

Wrenches: 1 large and 1 small

Halogen bulb, 12V, 100W (1)

Fuses: AC250, 1.25A, slow-blow fuse; AC 125, 2.5 A, slow-blow fuse (4 each)



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Warranty

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of one year* from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

Claims and Returns

- Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within 10 days after receipt of shipment. Claims for lost shipments must be made within 30 days of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim settles. In some instances, photographic documentation may be required. Some items are time sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container.
- WPI cannot be held responsible for items damaged in shipment en route to us. Please enclose merchandise in its original shipping container to avoid damage from handling. We recommend that you insure merchandise when shipping. The customer is responsible for paying shipping expenses including adequate insurance on all items returned.
- Do not return any goods to WPI without obtaining prior approval and instructions (RMA#) from our returns department. Goods returned unauthorized or by collect freight may be refused. The RMA# must be clearly displayed on the outside of the box, or the package will not be accepted. Please contact the RMA department for a request form.
- Goods returned for repair must be reasonably clean and free of hazardous materials.
- A handling fee is charged for goods returned for exchange or credit. This fee may add up to 25% of the sale price depending on the condition of the item. Goods ordered in error are also subject to the handling fee.
- Equipment which was built as a special order cannot be returned.
- Always refer to the RMA# when contacting WPI to obtain a status of your returned item.
- For any other issues regarding a claim or return, please contact the RMA department

Warning: This equipment is not designed or intended for use on humans.

** Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.*

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DECLARATION OF CONFORMITY

We: World Precision Instruments, Inc.
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USA

as the distributors of the apparatus listed, declare under sole responsibility that the product(s):

Title:	
<u>YZ20T Series</u>	WPI P/N PSMT
<u>YZ20P Series</u>	WPI P/N PSMB
<u>NZ20 Series</u>	
<u>SOM2000 Series</u>	

to which this declaration relates is/are in conformity with the following standards or other normative documents:

Annex VII, Section 3

and therefore conform(s) with the protection requirements of Council Directive 89/336/EEC relating to electromagnetic compatibility.

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