



Horizontal Tissue Bath



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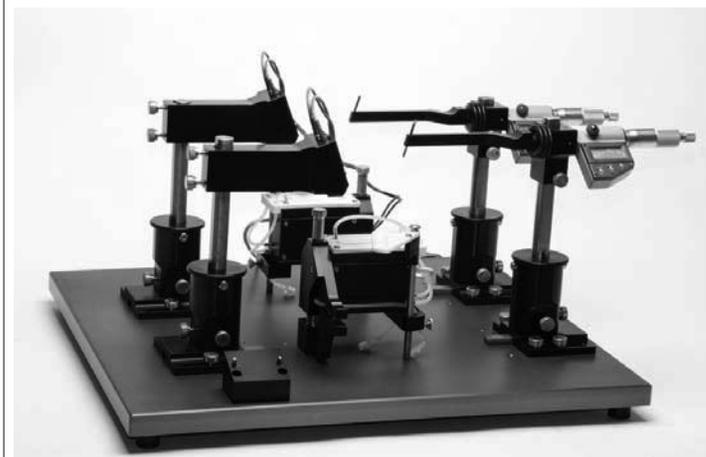
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BASIC SYSTEM ASSEMBLY INSTRUCTIONS

Serial No. _____



032714

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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 ten (10) days after receipt of shipment. Claims for lost shipments must be made within thirty (30) days of receipt of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim is settled. 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

Do not return any goods to us without obtaining prior approval and instructions from our Returns Department. Goods returned (unauthorized) by collect freight may be refused. Goods accepted for restocking will be exchanged or credited to your WPI account. Goods returned which were ordered by customers in error are subject to a 25% restocking charge. Equipment which was built as a special order cannot be returned.

Repairs

Contact our Customer Service Department for assistance in the repair of apparatus. Do not return goods until instructions have been received. Returned items must be securely packed to prevent further damage in transit. The Customer is responsible for paying shipping expenses, including adequate insurance on all items returned for repairs. Identification of the item(s) by model number, name, as well as complete description of the difficulties experienced should be written on the repair purchase order and on a tag attached to the item.

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

Filling the Cuvettes

1. Verify that the syringe valve is in the off (horizontal) position.
2. Fill the syringe with the perfusion solution.
3. Verify that the cuvettes and the drain tubing is empty. If it is not, see "Emptying the Cuvettes".
4. Open the syringe valve (vertical position) and gently press the syringe plunger until the cuvettes are filled to the desire level.
5. Close the syringe valve (horizontal position).

Emptying the Cuvettes

1. Verify that the syringe valve is in the off (horizontal) position.
2. Plug in the vacuum pump and turn it on.
3. Gently lift the pinch valve and hold it up until the liquid in the cuvettes and line tubing is completely evacuated (**Fig. 37**).



Fig. 37—Lift the spring-loaded pinch valve to allow the waste fluid to be evacuated into the reservoir

4. Release the pinch valve and turn off the vacuum pump.

ABOUT THIS MANUAL

The following symbols are used in this guide:

-  This symbol indicates a CAUTION. Cautions warn against actions that can cause damage to equipment. Please read these carefully.
-  This symbol indicates a WARNING. Warnings alert you to actions that can cause personal injury or pose a physical threat. Please read these carefully.

NOTES and TIPS contain helpful information.

INTRODUCTION

This document details the assembly of the SIH Muscle Tester.

Parts List

After unpacking, verify that there is no visible damage to the instrument. Verify that all items are included:

- (1) Base Plate Assembly
- (2) Cuvette Assemblies, including:
 - (2) Cuvette
 - (2) Psuedo cuvette
- (2) Micrometer Assemblies (or Motor Assemblies)
- (2) Force Transducer Stand Assemblies
- (6) **2851** 6' BNC cables (**SI-HTBM** systems include (8) **2851** cables and (4) **13854** BNC T connectors.)
- (1) Accessories Kit, including:
 - (16) Thumbscrews
 - (6) Screws for the cuvette mounting posts
 - (2) Cuvette mounting posts
 - (2) Pseudo cuvette mounting posts
- (1) Signal Conditioning Amplifier System with 2 **SI-BAM-LCB** bridge amplifiers and 1 **SI-TCM2B** 2-channel temperature controller
- (1) Data Acquisition System
- (1) Cuvette Vacuum System
- (1) **801566/801963** Mini Vacuum Pump
- (2) SI-KG force transducers
- (2) Pairs of tissue mounts
- (1) Manual

Unpacking

Upon receipt of this instrument, make a thorough inspection of the contents and check for possible damage. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed damage should be reported at once to the carrier and an inspection requested. Please read the section entitled "Claims and Returns" on page 17 of this manual. Please contact WPI Customer

Service if any parts are missing at 941.371.1003 or customerservice@wpiinc.com.

Returns: Do not return any goods to WPI without obtaining prior approval (RMA # required) and instructions from WPI's Returns Department. Goods returned (unauthorized) by collect freight may be refused. If a return shipment is necessary, use the original container, if possible. If the original container is not available, use a suitable substitute that is rigid and of adequate size. Wrap the instrument in paper or plastic surrounded with at least 100mm (four inches) of shock absorbing material. For further details, please read the section entitled "Claims and Returns" on page 17 of this manual.

INSTRUMENT SETUP

Before setting up the Horizontal Tissue Bath, carefully open each box and inspect the contents. Carefully unwrap each piece before beginning. The following instructions graphically show how to setup your system.

NOTE: If you have a problem/issue that falls outside the definitions of this manual, contact the WPI Technical Support team at 941.371.1003 or technicalsupport@wpiinc.com.

Hardware Assembly

The major parts of the Horizontal Tissue Bath are pointed out in **Fig. 1** below.

CAUTION: The baseplate is heavy, so assembly requires two people. Do not setup this equipment by yourself.

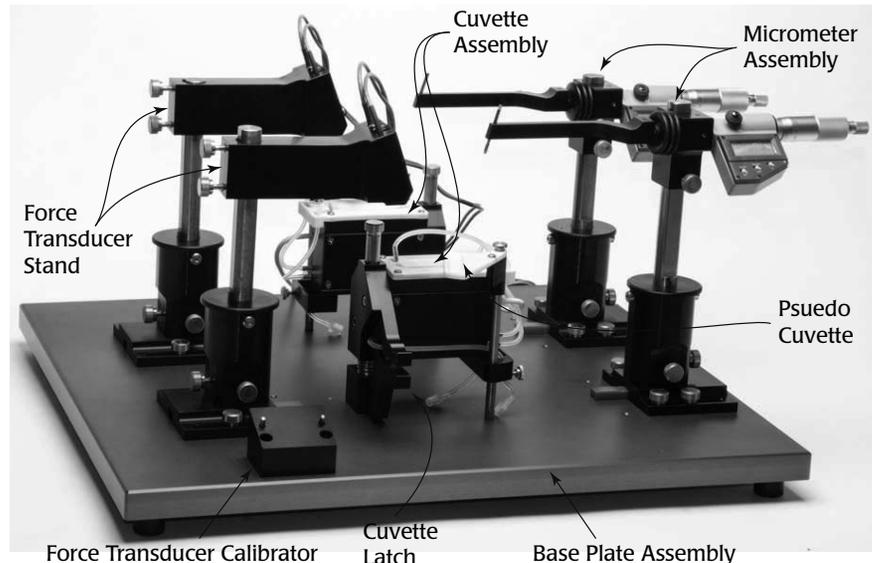


Fig. 1—Muscle Tester parts



Fig. 34—(Left) Plumbing the Vacuum System

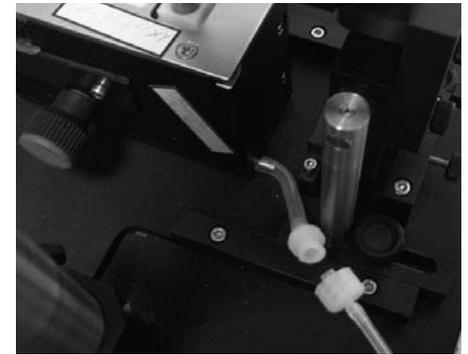


Fig. 35—(Right) Drain connector on the cuvette

3. Connect a length of thin tubing to the bottom of the T-connector. Connect the other end to the side of the second T-connector. Use two more lengths of the thin tubing to connect the bottom and top of the second T-connector to the drains on the two cuvettes. (Fig. 35).
4. Screw the syringe into the top of the syringe stand. The syringe valve is in the on position when the valve is positioned up and down (Fig. 36).



Fig. 36—Syringe valve is in the on position.

5. Connect a short length of thin tubing to the bottom of the syringe valve. Connect the other end to the top of the T-connector.
6. If you are bubbling gas into the system, connect the gas supply to the Gas Inlet port on the side of the cuvette. Use the Gas Adjustment Knob to regulate the flow of the gas.

Assembling the Vacuum System

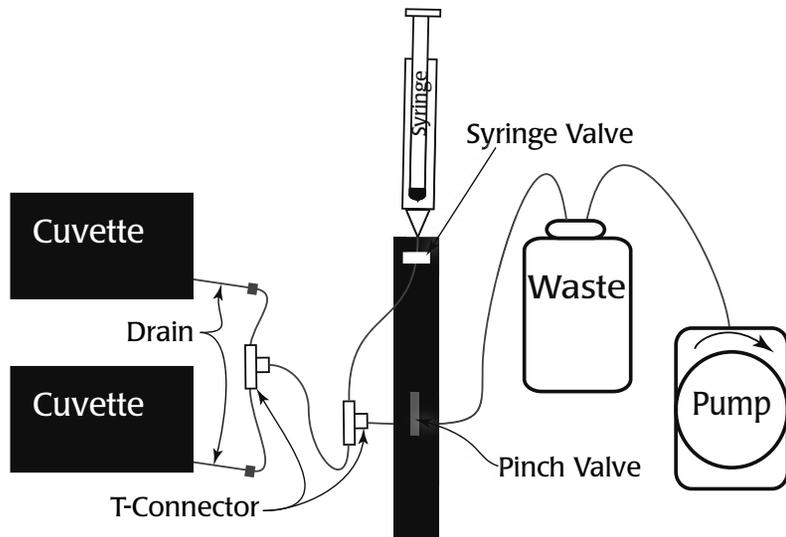


Fig. 32—Plumbing diagram for the vacuum system

1. Press the large tubing over the nipple on the pump. Press the other end over the large connector on the waste reservoir (Fig. 33).



Fig. 33—Connect to the pump

2. Connect a length of thin tubing to the small connector on the top of the waste reservoir. Lift the red pinch valve and run the tubing through the black syringe stand (under the spring-loaded pinch valve). Then, connect the other end to the side of the T-connector (Fig. 34).

1. Position the base with the transducer stand in the front.

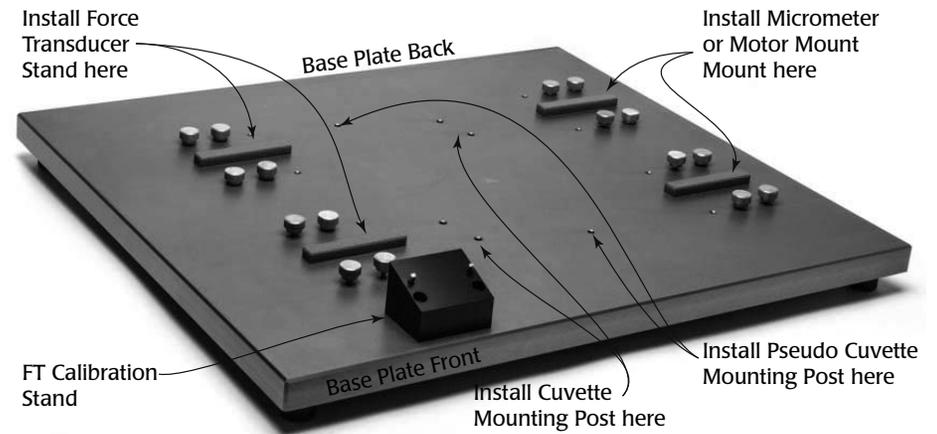


Fig. 2— The base plate assembly is shipped with the calibration stand installed.

2. The cuvette assembly includes the cuvette and the pseudo cuvette and the posts to mount them.

Tilt the base plate up, and let a friend hold it in place. Then, insert a screw from the backside of the baseplate into one of the Pseudo Cuvette Mounting Post holes. Screw the mounting post into position and tighten it with a hex key. Install the second mounting post in the same manner. See Fig. 2 to properly position the mounting posts.

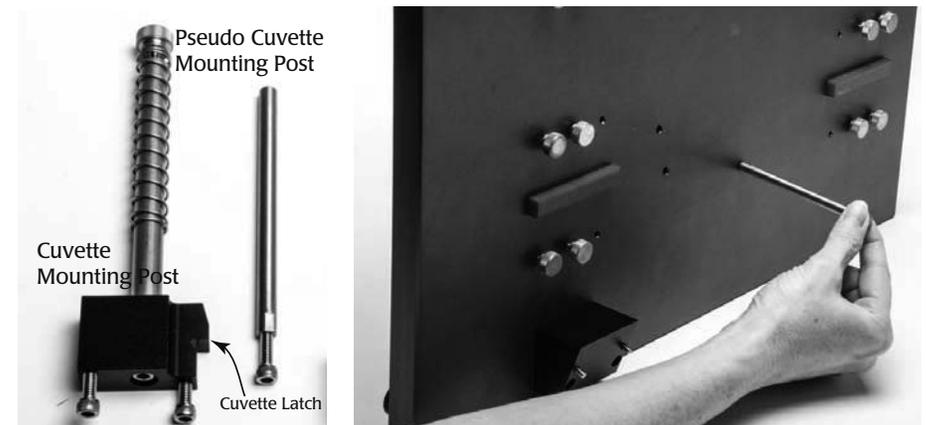


Fig. 3—(Left) The two posts are required to mount a cuvette.

Fig. 4—(Right) Install the first pseudo cuvette mounting post.

- The cuvette mounting post requires two screws to mount it. While a friend holds the base plate, insert the screws through the back side of the base plate into the cuvette mounting post holes. The cuvette mounting post latches should face to the front and rear of the baseplate. Align the screw holes on the cuvette mounting post with the holes on the base plate (Fig. 5). Use a hex wrench to tighten both screws. Install the second cuvette mounting post in a similar fashion. Be sure that the cuvette latches do not point towards the center of the base plate when they are installed.

After installing the mounting posts, carefully set the base plate down on a flat surface with the calibration stand (front of the base plate) facing you.

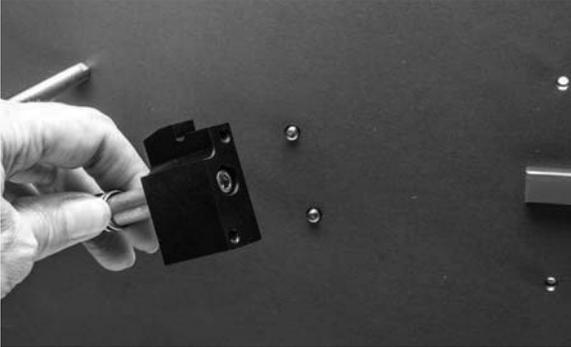


Fig. 5—Align the holes on the cuvette mounting post with the holes on the base plate. Make sure that the cuvette latch does not point towards the center of the base plate.

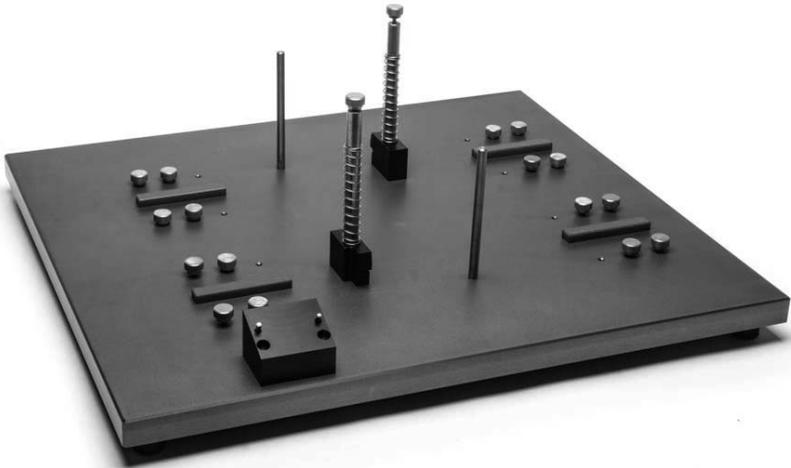


Fig. 6—After installing the cuvette mounting posts, carefully set the base plate down on a flat surface.

cuvette. The second pump removes buffer solution from the top of the cuvette and prevents overflow. Connect it with the Liquid Outlet port that is connected with the adjustable-height tube in the cuvette. Set the height so that the end of the tube is at the top of the desired depth of the buffer. Then, set the pump to pull liquid through at a higher rate than the first pump is pumping liquid into the cuvette.

The vacuum system includes a pump, syringe stand, syringe, waste reservoir and tubing. See Fig. 31.

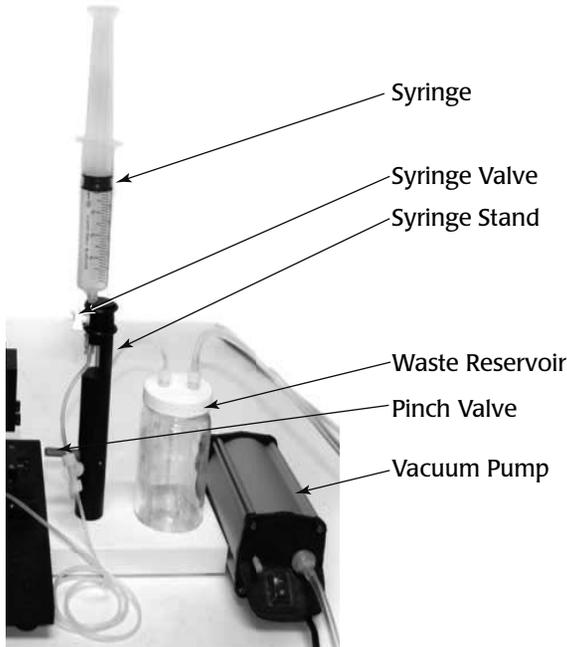


Fig. 31—Vacuum system, labeled parts

15. Install the second force transducer stand using the same method.

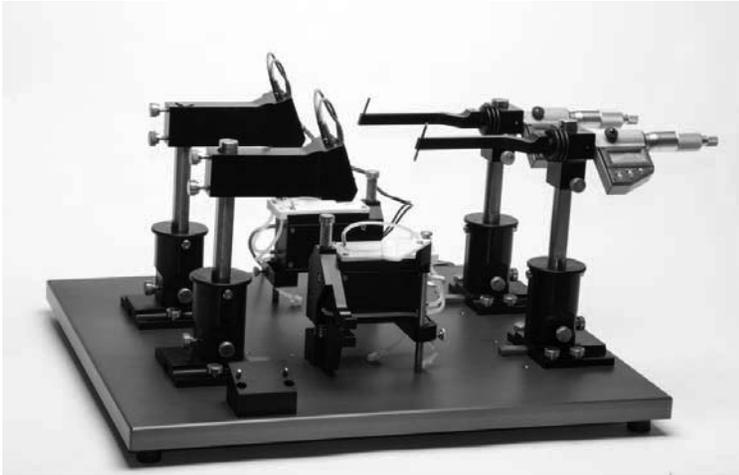


Fig. 28—The SI-HTB hardware is setup.

Plumbing the Cuvette

Each system includes a vacuum pump. The system can also be connected with a gas delivery system. The connections made are shown in Fig. 29 and Fig. 30.

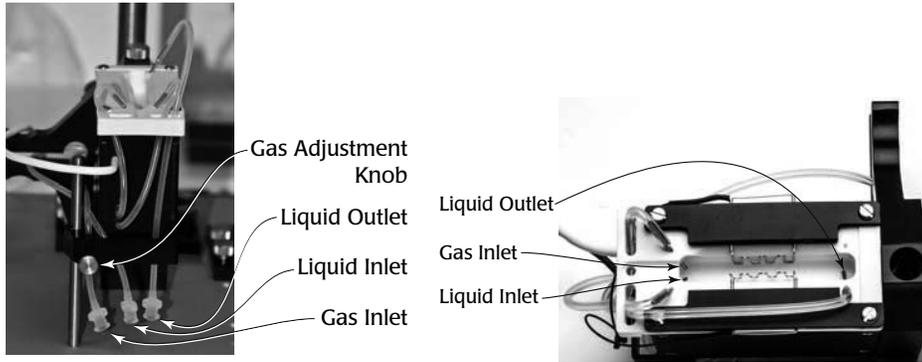


Fig. 29—(Left) The side view of the cuvette shows the three tubes for connecting the gas supply and liquid pumps.

Fig. 30—(Right) The top view of the cuvette shows the gas supply, liquid inlet and outlet tubes positioned in the cuvette. Notice that the Liquid Outlet tube is high in the cuvette, while the Liquid Inlet tube nearly touches the bottom of the cuvette.

NOTE: If you prefer, the system may be setup with two peristaltic pumps. The first pump delivers buffer to the cuvette and is connected to the Liquid Inlet port on the

4. Remove the thumb screw on the upright cuvette mounting post. Align the cuvette with the upright mounting post and the pseudo cuvette post. Slide the cuvette over the two mounting posts and into position. (Fig. 8).

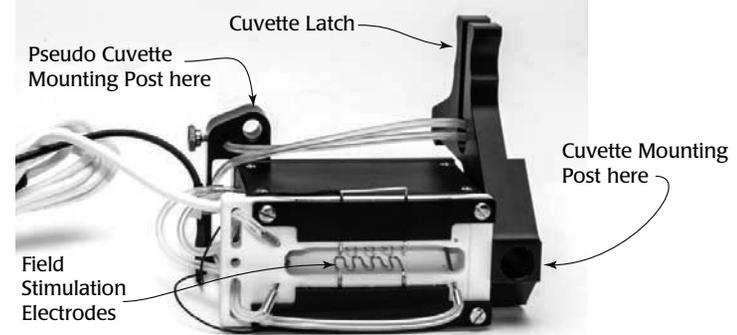


Fig. 7—The cuvette assembly slides over the pseudo cuvette mounting post and the cuvette mounting post.

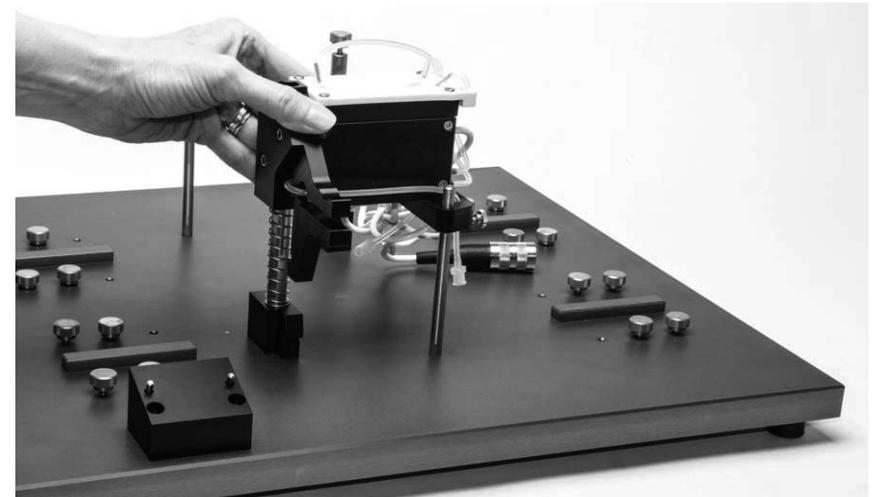


Fig. 8—Slide the cuvette over the mounting posts.

5. Gently press the cuvette latch to retract it and slide the cuvette into its lower position (Fig. 9). Release the latch so that it holds the cuvette in the lower position.

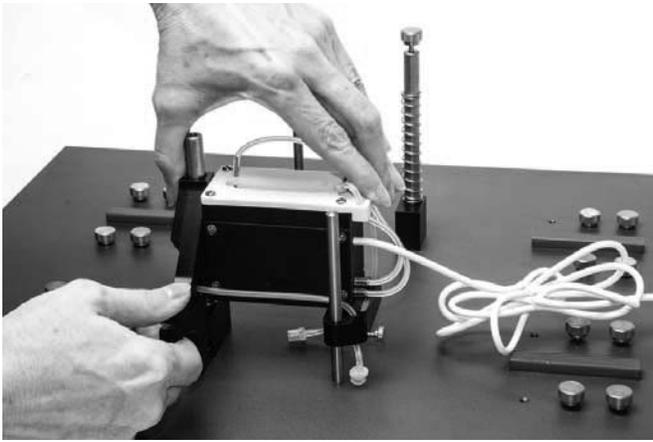


Fig. 9—Pinch the cuvette latch together with one hand and gently press down with the other hand to secure the cuvette in its low position.

6. Reinstall the screw in the top of the cuvette mounting post (Fig. 10). Slide the pseudo cuvette over the pseudo cuvette mounting post (Fig. 11).

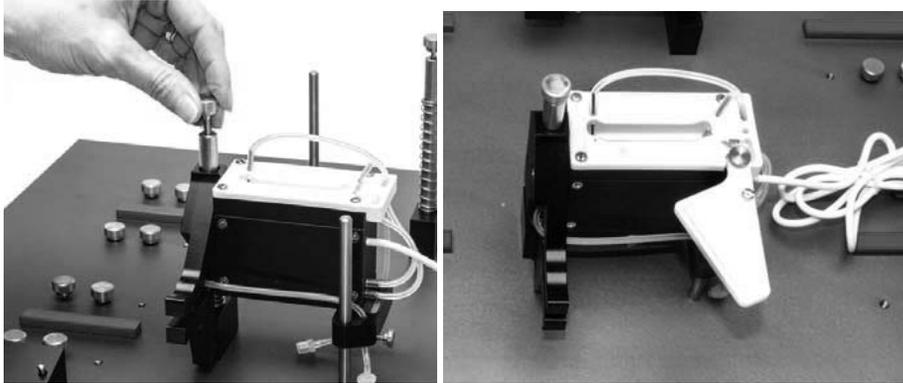


Fig. 10—(Left) Reinstall the thumbscrew into the top of the cuvette mounting post.

Fig. 11—(Right) Slide the pseudo cuvette over the pseudo cuvette mounting post.

The pseudo cuvette can be used when mounting tissues. Before you rotate the pseudo cuvette into position for use, verify that the cuvette is latched in the lower position, and be careful of the mounting hooks as you rotate. (Fig. 12).

13. Gently slide the tissue mount up on the pin that extends from the end of the force transducer (Fig. 25).

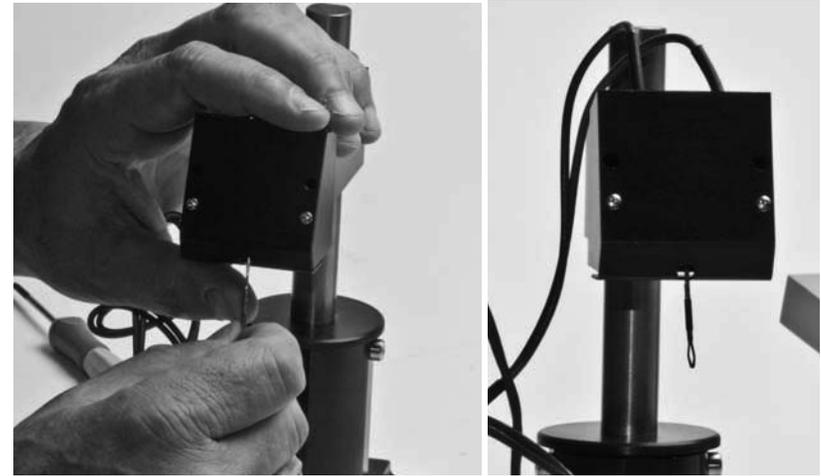


Fig. 25—(Left) Slide the tissue mount into place.

Fig. 26—(Right) Once the tissue mount is installed, install the Force Transducer Stand.

14. Position the assembled force transducer stands (Fig. 27) on the left side of the base plate so that the mounting slots on the stand align with the holes in the base plate. The force transducer mount must face the cuvette. Insert four thumbscrews through the mounting slots of the stand and into the four holes on the left side of the base plate. Slide the force transducer mount into the position you prefer and finger tighten the screws.

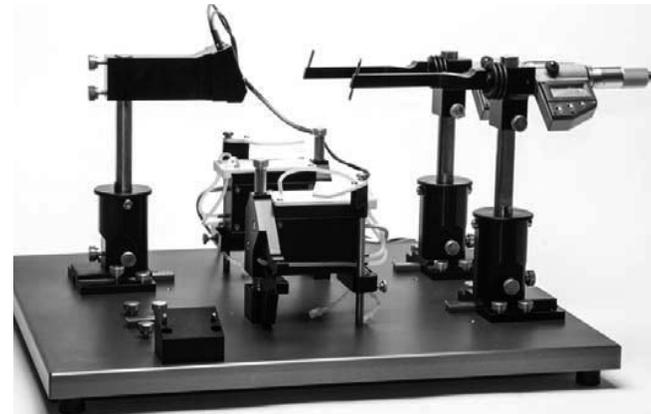


Fig. 27—Position the force transducer stand on the left side of the base plate.

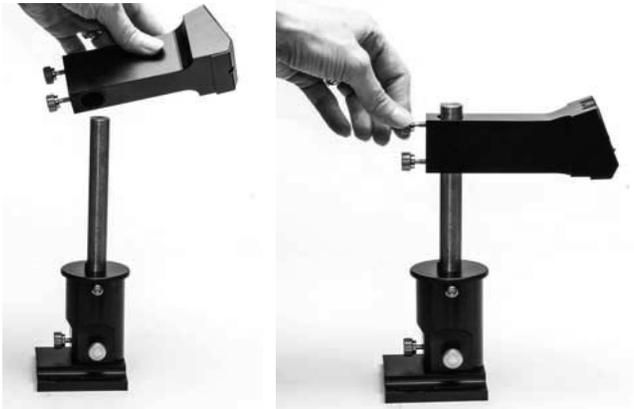


Fig. 20—(Left) Slide the force transducer holder onto the post of the stand.

Fig. 21—(Right) Tighten the height adjustment thumb screws to secure the holder.

12. To install the force transducer, remove the two small screws on the face of the force transducer mount and remove the cover. Loosen the two screws on the top of the KG force transducer. Position the force transducer in its mount (Fig. 23). Tighten the two force transducer screws to hold it in place. Reinstall the cover and secure it with the two screws (Fig. 24).

Force Transducer Stand Assembly



Fig. 22—(Left) Force Transducer Stand

Fig. 23—(Center) Tighten the two screws on the top of the force transducer to hold it in place.

Fig. 24—(Right) Reinstall the cover and secure it with two screws.

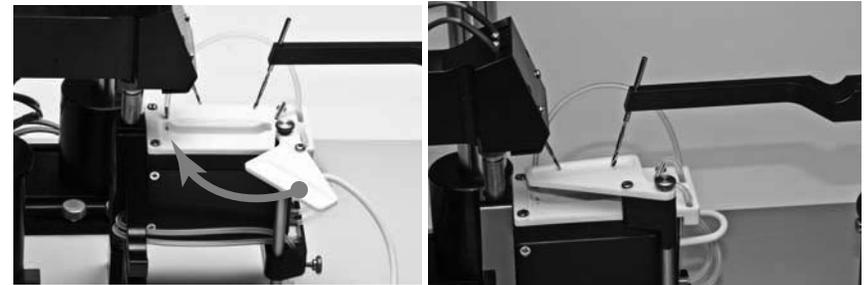


Fig. 12—(Left) Rotate the pseudo cuvette into position. Do NOT let the pseudo cuvette damage the tips of the mounting hooks.

Fig. 13—(Right) The pseudo cuvette (in position) can be used for mounting tissue.

7. In a similar manner, install the second cuvette assembly on the opposite side of the base plate.

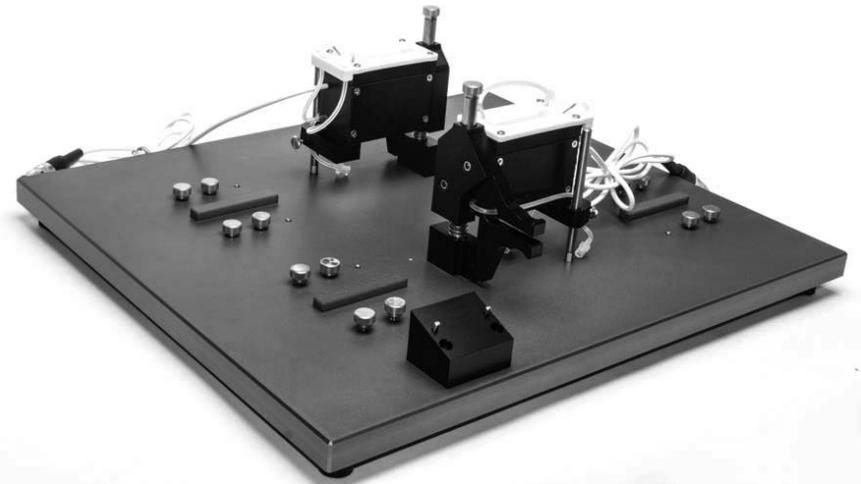


Fig. 14—The cuvettes are installed so that the cuvette latches face the outsides of the base plate where they are accessible when you are ready to mount tissues.

8. Position the micrometer assemblies (or motor assemblies) (Fig. 15) on the right side of the base plate so that the mounting slots on the micrometer align with the holes in the base plate. Make sure that the digital displays of the micrometers face the front of the base plate. Use four holes and insert four thumb screws through the slots on the base of the micrometer assembly and into the screw holes. The position of the micrometer is flexible, depending on the screw holes you choose and how you position the micrometer assembly. When the micrometer is in the position, tighten the thumb screws.

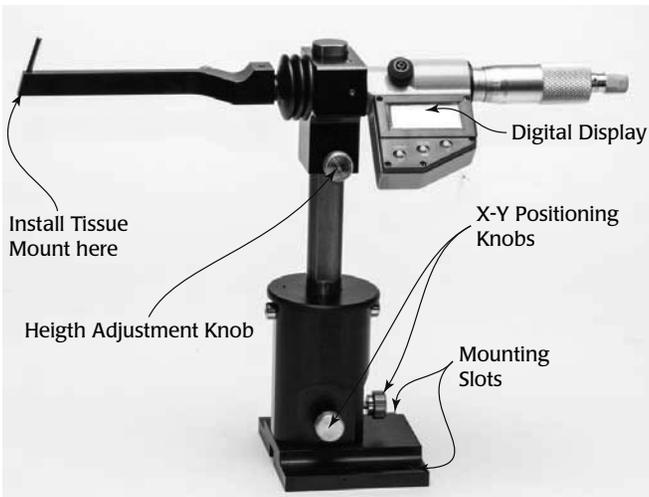


Fig. 15— Micrometer assembly



Fig. 16—Mount the micrometer (motor) stands on the right side using four thumbscrews for each stand.

9. In a similar way, mount the second micrometer (or motor) assembly next to the first.
10. Gently slide the tissue mounting hooks up on the pin that extends from the arm of the micrometer (Fig. 15). Some mounting hooks require an adapter (Fig. 17).
If you are using one of the mounting hooks (type 1-8), which is designed for use with the **SI-KG4A**, **SI-KG4B** and **SI-KG7B** force transducers, you must first slide

the mounting hook into the adapter (Fig. 17) before sliding the adapter into the pin of the micrometer arm. When the **SI-KG2** force transducer is used with the large mounting hooks (types 9-11), no adapter is needed.



Fig. 17—The mounting hook slides into the adapter before it is installed in the micrometer assembly.

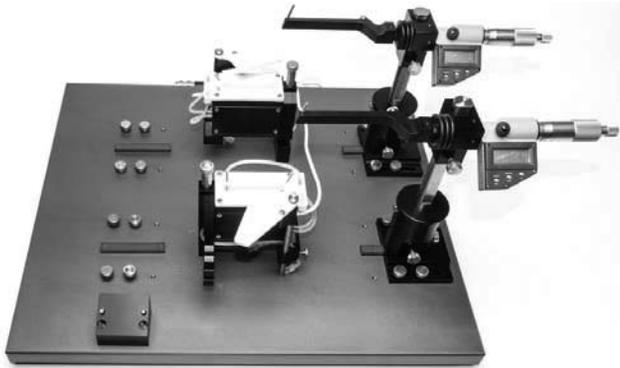


Fig. 18—The two micrometers are installed so that the digital displays may be read at the same time.

11. The force transducer stand assembly includes the stand and the force transducer holder. Slide the rod of the stand through the hole on the holder (Fig. 20) and tighten the two height adjustment knobs (Fig. 21).

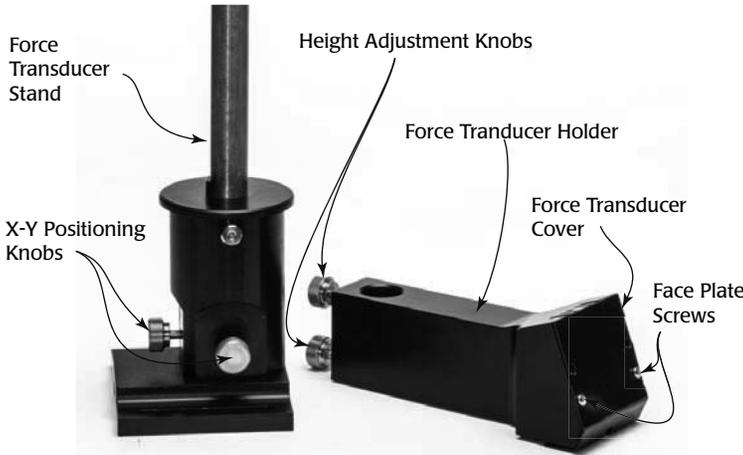


Fig. 19—The force transducer stand assembly includes the stand and the holder.