



SIH Muscle Tester

BASIC SYSTEM ASSEMBLY INSTRUCTIONS

Serial No. _____



031912

www.wpiinc.com

World Precision Instruments

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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
- (1) Microscope Mast Assembly, including:
 - (1) Microscope mast
 - (1) Safety clamp
 - (1) Microscope (focus) mount
 - (1) 76mm adapter ring
 - (1) Thumb screw
 - (1) Nut
- (1) Cuvette Assembly, including:
 - (1) Cuvette
 - (1) Psuedo cuvette
- (1) Micrometer Assembly, including:
 - (1) Micrometer
 - (2) Thumb screws
- (1) Force Transducer Stand Assembly, including
 - (1) Force transducer stand
 - (2) Thumb screws
- (1) PZMIII Microscope head

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 15 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 15 of this manual.

INSTRUMENT SETUP

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

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.

System Parts

The major parts of the Muscle Tester are pointed out in **Fig. 1** below.

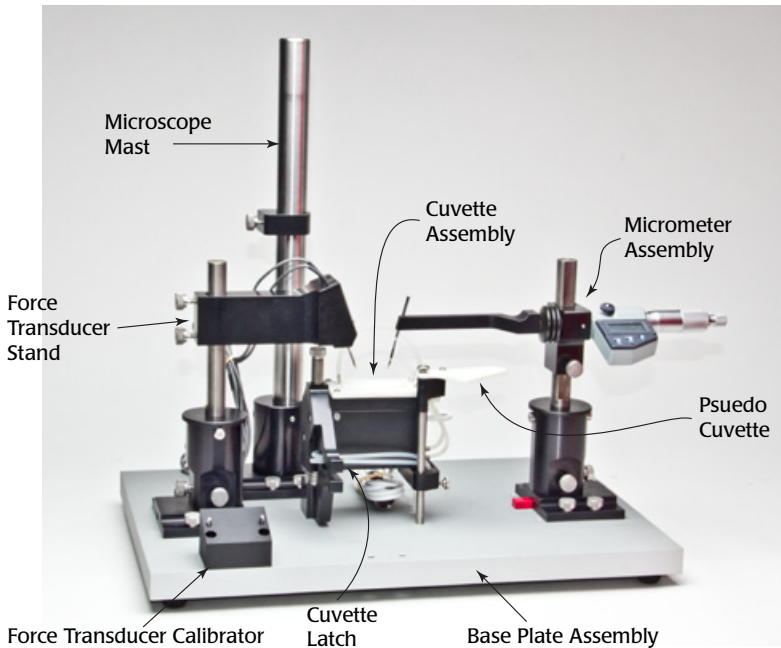


Fig. 1—Muscle Tester parts

1. Position the base of the microscope mast so that the mounting slots on the mast align with the screw holes on the back side of the base plate (**Fig. 2**). Choose four holes and insert four screws through the slots on the base of the microscope mast and into the screw holes. (Start with the four middle holes ad center the microscope mast over them. The position of the microscope is flexible, depending on the screw holes you choose and how you position the mast. Tighten the thumb screws (**Fig. 3**) to secure the mast in place.

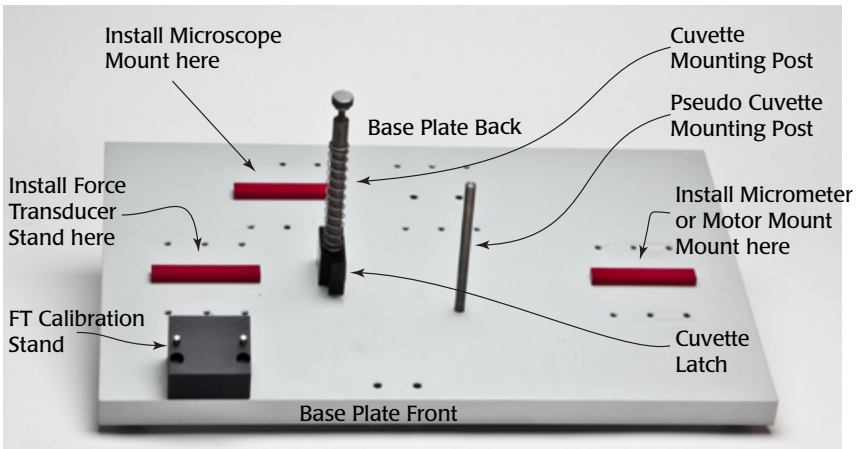


Fig. 2— Microscope mast and base plate assembly

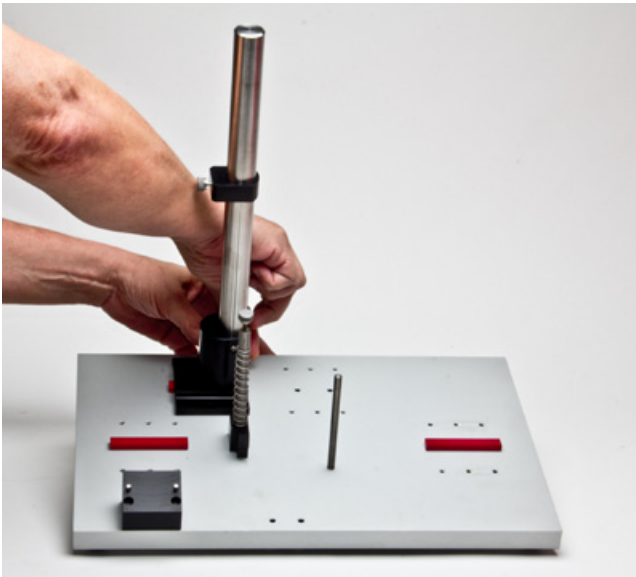


Fig. 3—Microscope mast installed

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2. The cuvette assembly includes the cuvette and the pseudo cuvette. 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 into position. (**Fig. 4**). Gently press the cuvette latch to retract it and slide the cuvette into its lower position. Release the latch so that it holds the cuvette in the lower position. Reinstall the screw in the top of the cuvette mounting post. Slide the pseudo cuvette over the second upright post (Pseudo cuvette mounting post).

NOTE: This system will come with one of three cuvettes. The one you chose may not look exactly like the one in the image.



Fig. 4—The Cuvette is installed.

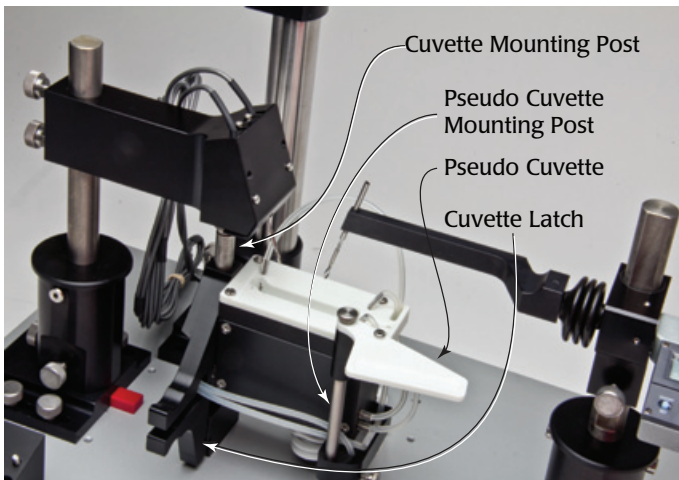


Fig. 5—The Cuvette slides into position over the cuvette mounting post and the pseudo cuvette mounting post. Then, the pseudo cuvette slides over its mounting post.

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. 6).

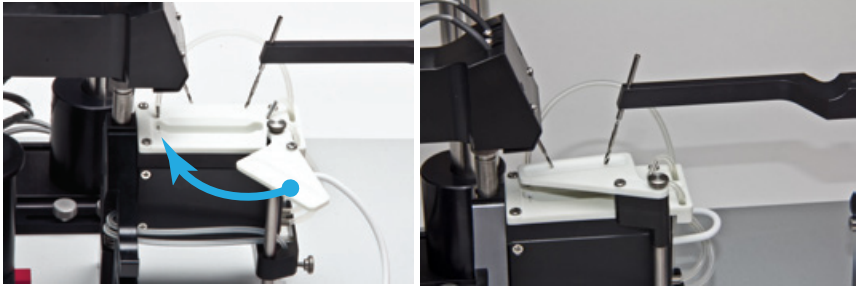


Fig. 6—(left) Rotate the pseudo cuvette into position. Do NOT let the pseudo cuvette damage the tips of the mounting hooks.

Fig. 7—(right) The pseudo cuvette (in position) can be used for mounting tissue.

3. Position the micrometer assembly (Fig. 8) on the right side of the base so that the mounting slots on the micrometer align with the holes in the base plate. Make sure that the digital display of the micrometer faces the front of the base plate. Use the four outside 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.

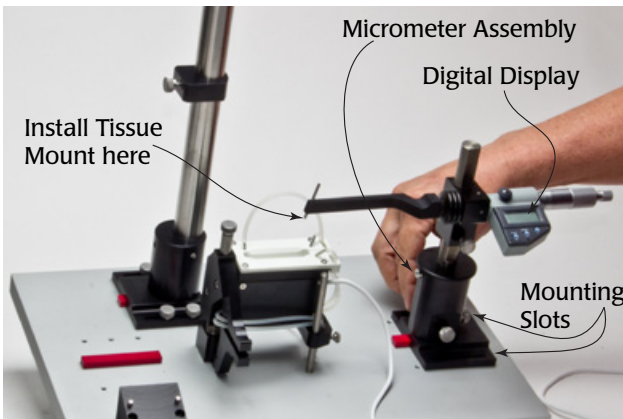


Fig. 8— Micrometer assembly

4. Gently slide the tissue mounting hook up on the pin the extends from the arm of the micrometer (Fig. 8). Some mounting hooks require an adapter (Fig. 9).

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. 9**) 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. 9—The mounting hook slides into the adapter before it is installed in the micrometer assembly.

5. 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 force transducer. Position the force transducer in its mount as shown in **Fig. 11**. Tighten the two force transducer screws to hold it in place. Reinstall the cover and secure it with the two screws (**Fig. 12**).

Force Transducer Stand Assembly

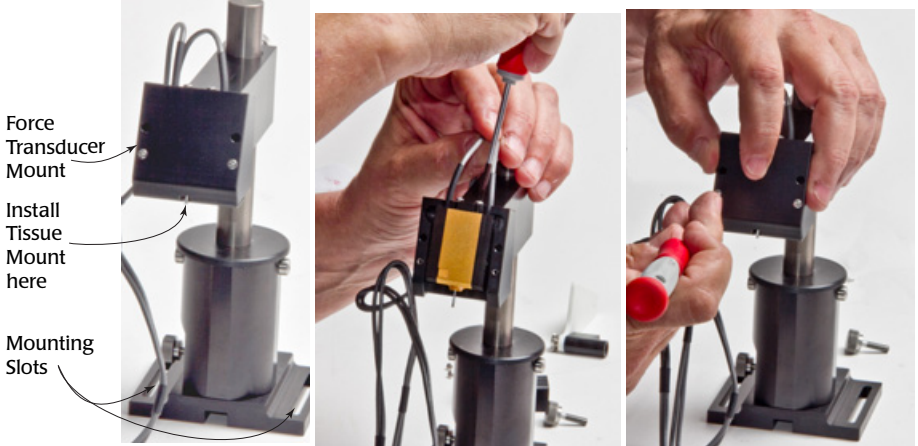


Fig. 10—(left) Force Transducer Stand

Fig. 11—(center) Tighten the two screws on the top of the force transducer to hold it in place.

Fig. 12—(right) Reinstall the cover and secure it with two screws.

6. Gently slide the tissue mount up on the pin the extends from the end of the force transducer as shown in **Fig. 13**.

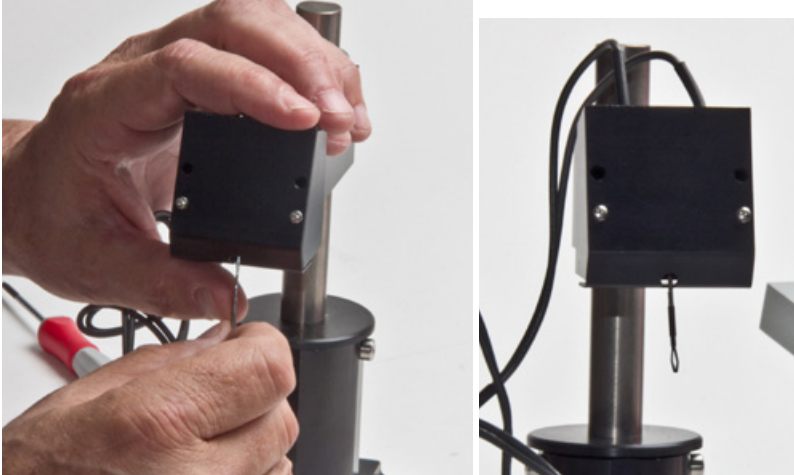


Fig. 13—Slide the tissue mount into place.

Fig. 14—Once the tissue mount is installed, the Force Transducer Stand can be installed.

7. Position the force transducer stand (**Fig. 15**) 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 outside holes on the left side of the base plate. Slide the Force Transducer Mount into the position you prefer and finger tighten the screws.

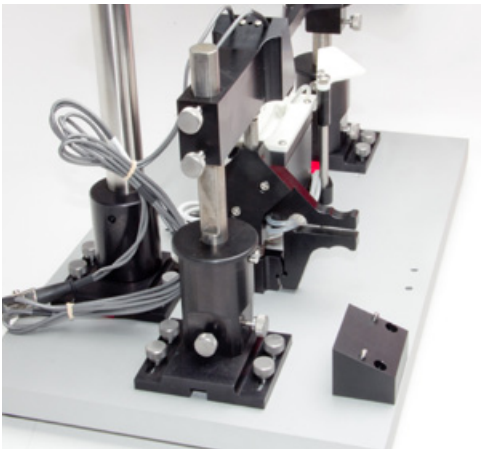


Fig. 15—Force transducer stand

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8. Verify that the microscope's safety clamp is installed on the microscope mast. Insert the 76mm adapter ring into the microscope focus mount and secure it with the supplied thumb screw. Slide the microscope mount onto the microscope mast and tighten with the thumb screw. Position the **PZMIII** microscope head in the microscope mount (Fig. 16).

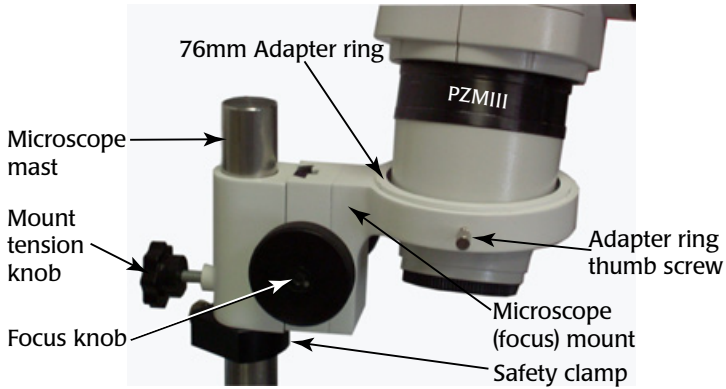


Fig. 16—Microscope mount assembly



Fig. 17— Muscle Tester assembled

Plumbing the Cuvette

Each system includes two peristaltic pumps. The system can also be connected with a gas delivery system. The connections made are shown in **Fig. 18** and **Fig. 19**.

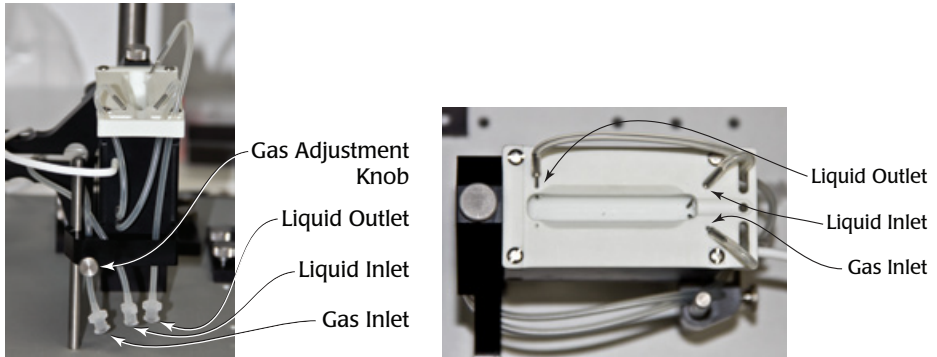


Fig. 18—(left) The side view of the cuvette shows the three tubes for connecting the gas supply and liquid pumps.

Fig. 19—(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.

1. The first pump delivers buffer to the cuvette. This pump should be set at the desired rate for delivery of fresh buffer solution. Connect this pump to the Liquid Inlet port on the cuvette. Position the liquid inlet tube deep in the cuvette.
2. 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.
3. 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.

APPENDIX A: INSTALLING A VACUUM SYSTEM

An optional vacuum system includes a pump, syringe stand, syringe, waste reservoir and tubing. See Fig. 20.

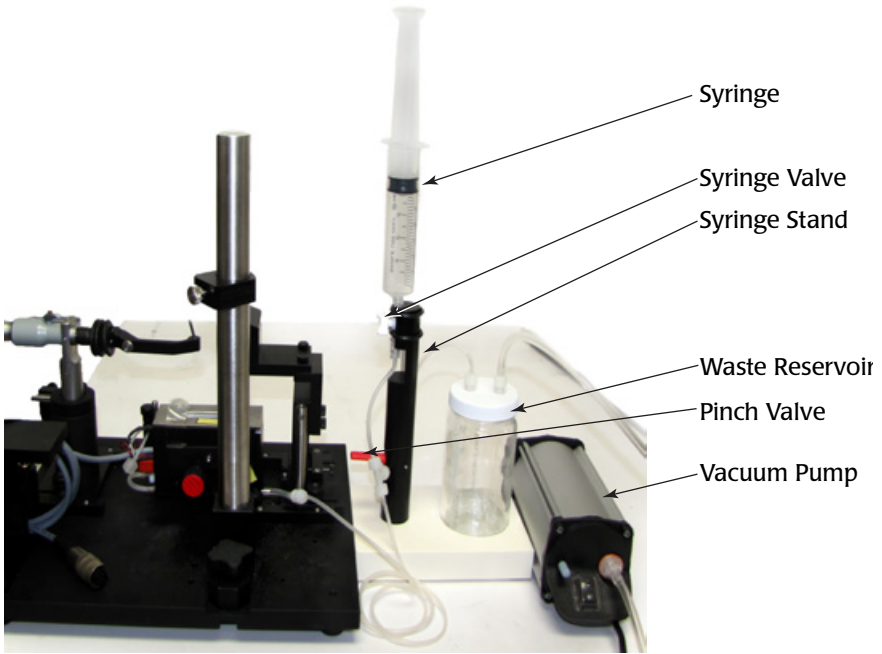


Fig. 20—Vacuum system, labeled parts

Assembling the Vacuum System

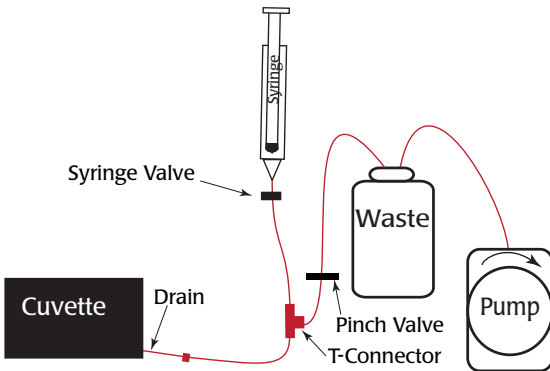


Fig. 21—Plumbing diagram for the vacuum system

1. Press the large tubing over the nipple on the pump. Press the other end over the large connector on the waste reservoir (Fig. 22).

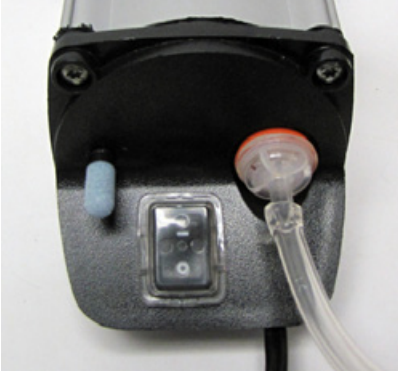


Fig. 22—Connect to the pump

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. 23).

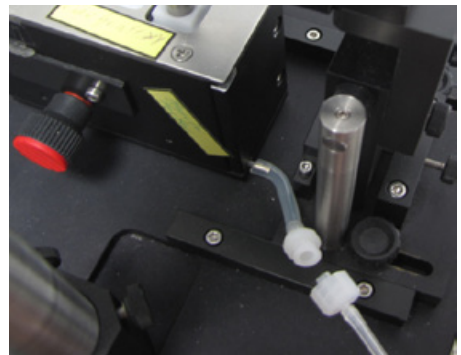


Fig. 23—(Left) Plumbing the Vacuum System

Fig. 24—(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 drain on the cuvette (Fig. 24).

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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. 25**).



Fig. 25—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.

Filling the Cuvette

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

Emptying the Cuvette

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 cuvette and line tubing is completely evacuated (**Fig. 26**).



Fig. 26—Lift the spring-loaded pinch valve to allow the waste fluid to be evacuated into the reservoir

4. Release the pinch valve.



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.*



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