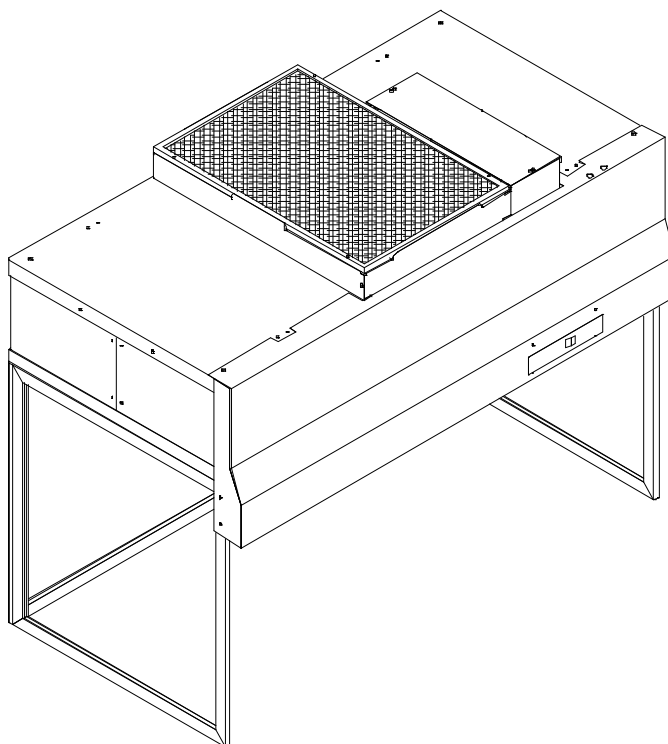


*** READ AND SAVE THESE INSTRUCTIONS ***

VLF-797 CLEAN BENCH INSTALLATION AND SERVICE MANUAL

11151-001 – 115 Volt Model

11151-002 – 220 Volt Model



Mac 10[®] and VE5[®] are registered Trademarks of the
Enviroco Corporation, Sanford, North Carolina, U.S.A.

US Patents 4,560,395 and 5,470,363 other patents issued and pending in foreign countries

Updated 9/09

1. READ AND SAVE THESE INSTRUCTIONS

WARNING!

**TO REDUCE THE RISK OF FIRE, ELECTRICAL SHOCK, OR INJURY TO PERSONS,
OBSERVE THE FOLLOWING:**

- A. Qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction, must do installation work and electrical wiring.
- B. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
- C. If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application.
- D. Use this unit only in the manner intended by the manufacturer. If you have any questions, contact the manufacturer:

ENVIRCO

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Sanford, NC 27330
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- E. Before servicing or cleaning unit, switch power off at service panel and lock service panel to prevent power from being switched on accidentally.

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I. PACKING LIST

11111-XXX	MAC10 ORIGINAL 2X4 STD, VLF	1 EA
24464-001	ASSY - FRONT PANEL, 120V	1 EA
24468-001	ASSY - BACK WINDOW PANEL	1 EA
24467-001	ASSY - SIDE WINDOW PANEL	2 EA
24466-001	ASSY - MAC 10 SUPPORT FRAME	1 EA
38408-001	EXTRUSION - UPRIGHT, SLIDE-IN	2 EA
HARDWARE 62176	#8X 3/4 PHILIPS FLAT HEAD SHEET METAL SCREW	11 EA
OPTIONAL		
24457-001	SHROUD TO COVER MAC 10 UNIT	1 EA
24464-002	ASSY - FRONT PANEL, 115V, EXTENDED	1 EA
24469-001	ASSY - FRONT WINDOW, UV FILTERING	1 EA

The VLF is shipped in a wood crate that contains a Mac 10 individually boxed and shrink wrapped parts. The hardware is shipped within the crate and packaged in a plastic bag. If the optional shroud is ordered, it is individually boxed.

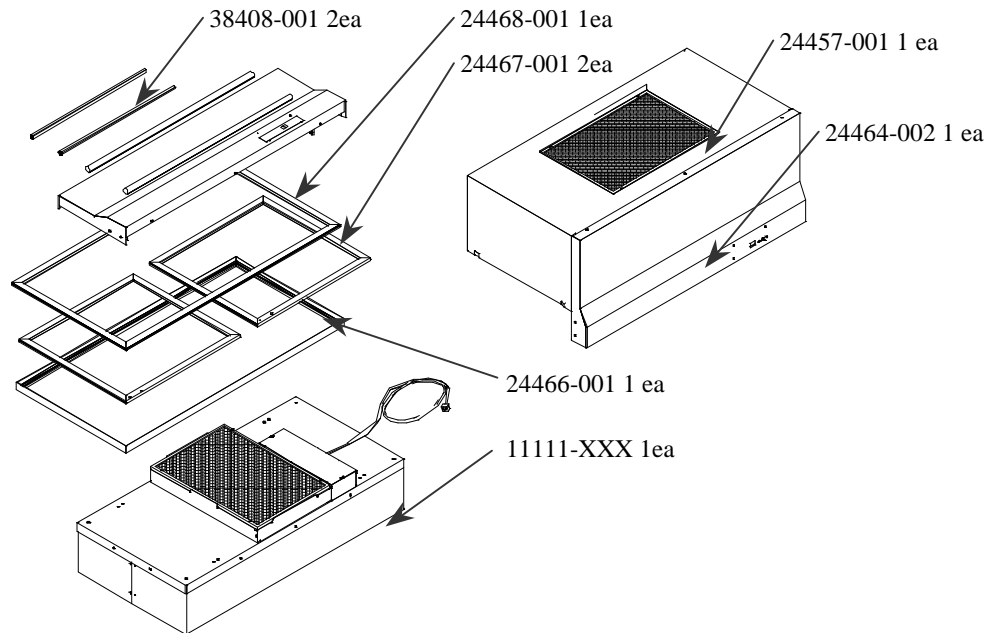


Figure 1 - Packing List Diagram

II. VLF-797 Assembly

Note:

**It is recommended to assemble the VLF in the location that it will be used.
One person can put the unit together, but two are recommended.**

Step 1: Assemble the slide-in extrusion to the back window.

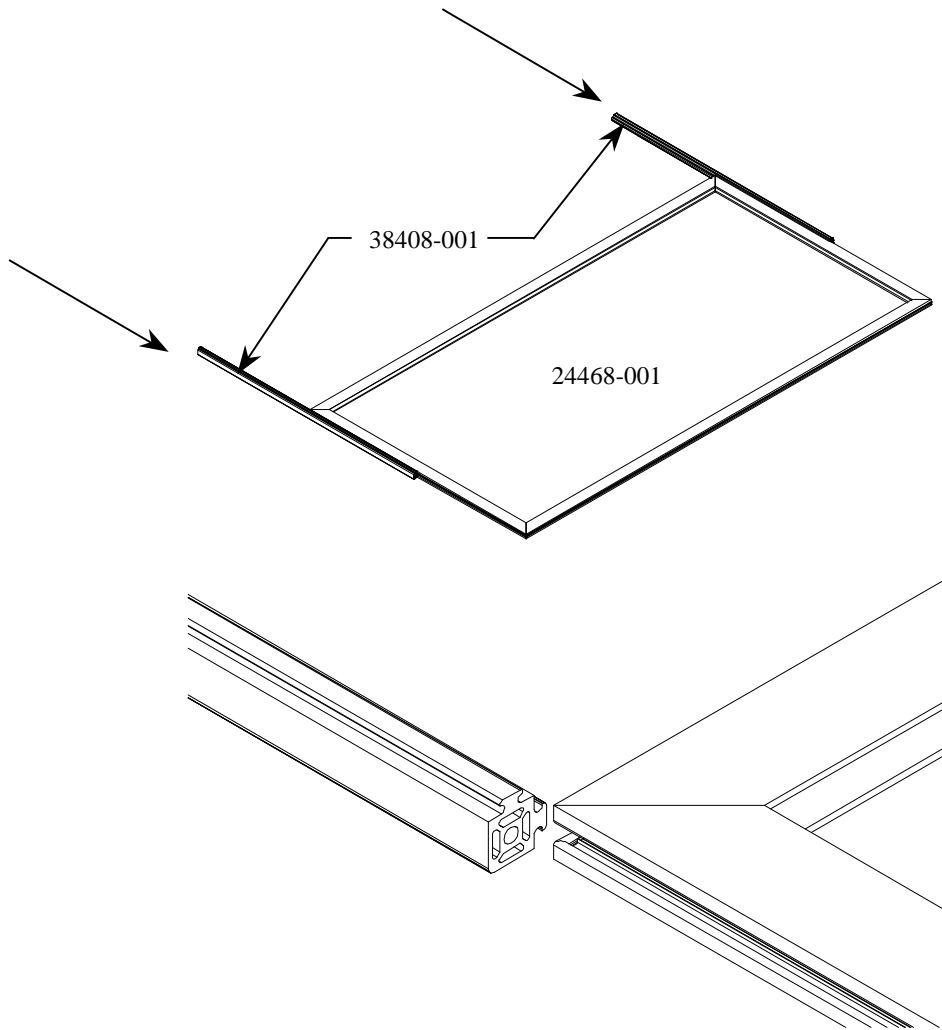


Figure 2 - Guide Installation

Step 2: Side Window Assembly

Assemble the two side windows to the back window. The side windows should have the extrusion with the two holes facing away from the slide. When the side window is correctly located on the stand the extrusion on the bottom of the stand should be smooth and the extrusion at the top of the stand should all have a slot for attachment.

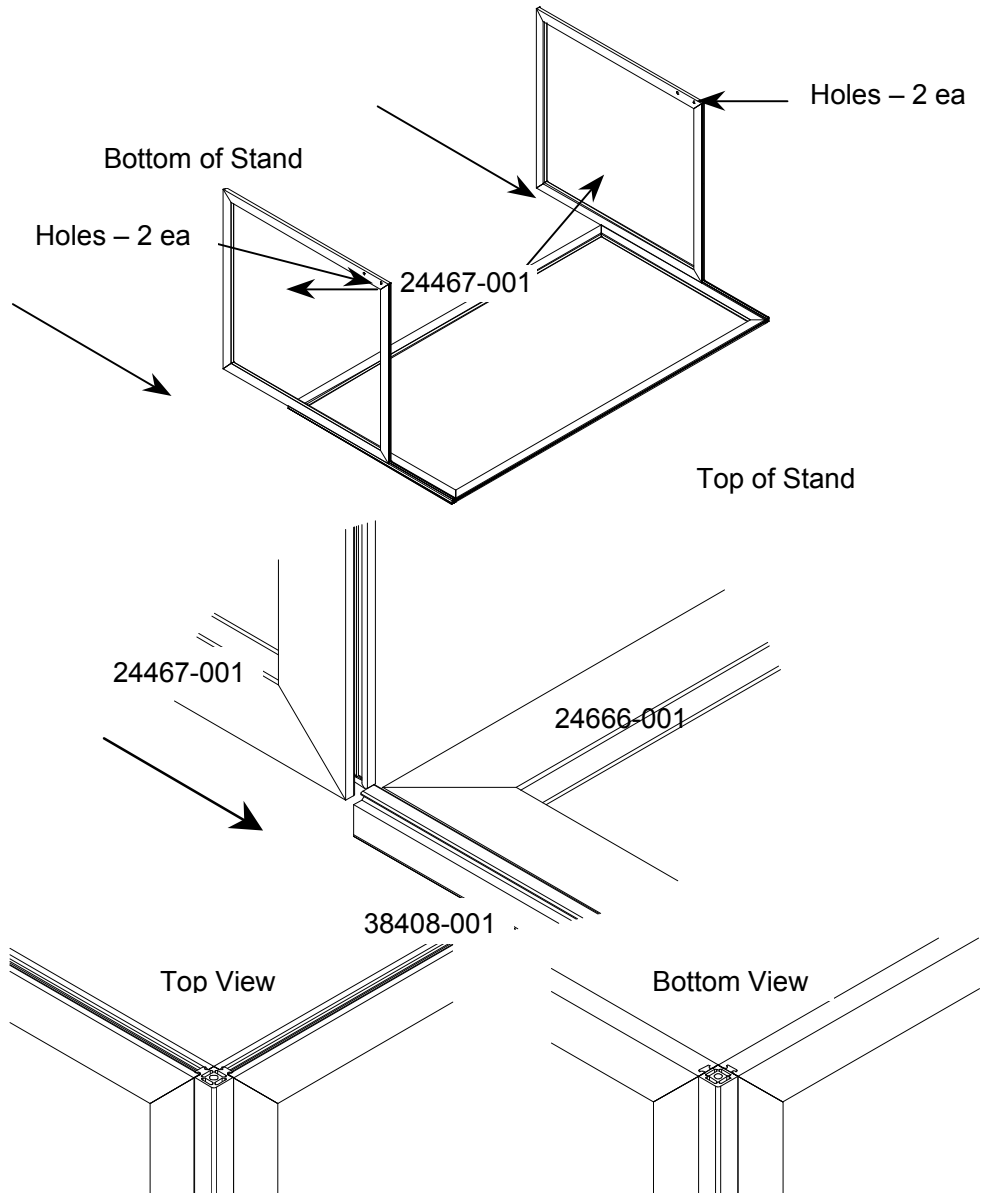


Figure 3 - Side Window Installation

Step 3: Stand Rotation:

Rotate the three-window assembly to the upright position, 90 counterclockwise. This will put the 2 holes on the side window assembly on the upper side of the assembly. There is a tendency to for the slide-in extrusion (38408-001) to slide during this operation; therefore it is recommended to make every effort to keep the bottom of the rear window in contact with the work surface.

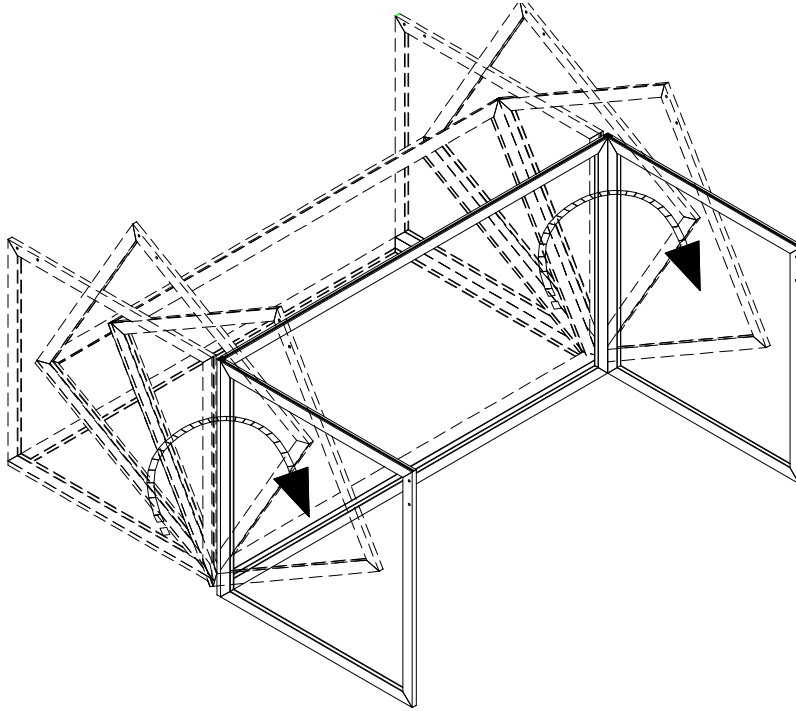


Figure 4 - Stand Rotation

Step 4: Mounting the MAC 10 Support Frame to the Window Assembly.

Square the Mac 10 Support Frame on the Window assembly. Using the 11 ea # 8x 3/4 Philips head screws attach the frame to the window assembly. There are eleven (11) predrilled holes in the Mac 10 Support frame, which allow the screw to be inserted to the threaded channels of the side and back windows. Install the gasket provided gasket on upper flange of the Support Frame after all the screws have been installed.

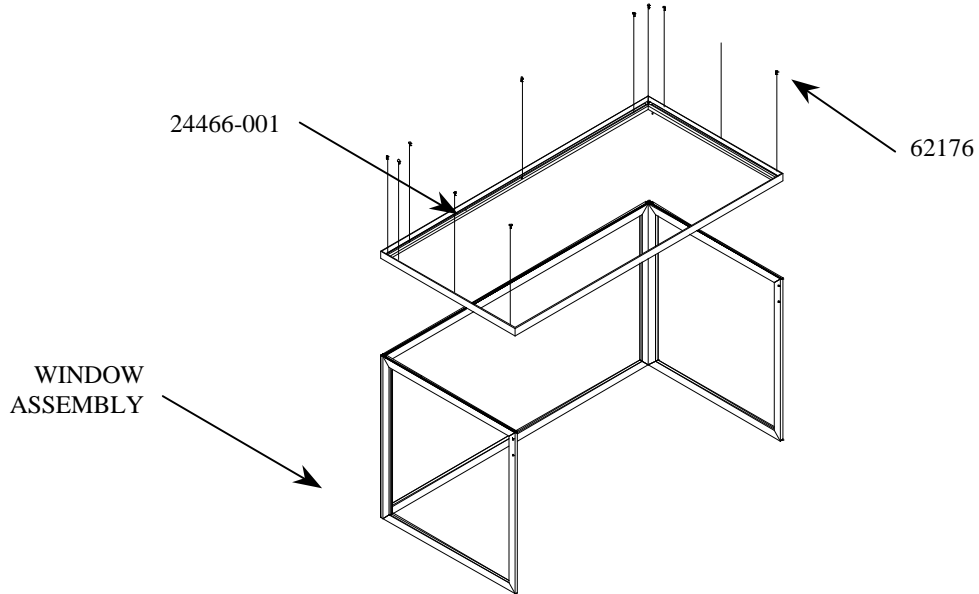


Figure 6 - Mac 10 Support Frame Installation

WARNING!

The Standard Filter is protected with an expanded metal face screen. This is never to be used to handle the filter. It is only for protection against an accidental touch of the filter. Only handle the filter by the frame.

Step 5: Mounting the MAC 10 to the Support Frame

Remove the Mac 10 from the box. Inspect the unit for damage and notify Envirco if there is any apparent damage. After removing the unit from plastic bag, locate the roll of white gasket located in the box and apply to the flange around the perimeter of the filter face. The flange is parallel to the filter face. With the VLF-797 stand located in its position with the lab, lift the Mac 10 into place. **Two persons are REQUIRED for the placement of the Mac 10 onto the stand.** Additionally, extreme caution should be taken when lifting the Mac 10, only grasp the sides of the unit and never touch the filter screen. The electrical box should be on the right front when the unit is in the correct orientation. The unit is design to seat on the Mac 10 Support Frame without the use of mechanical fasteners.

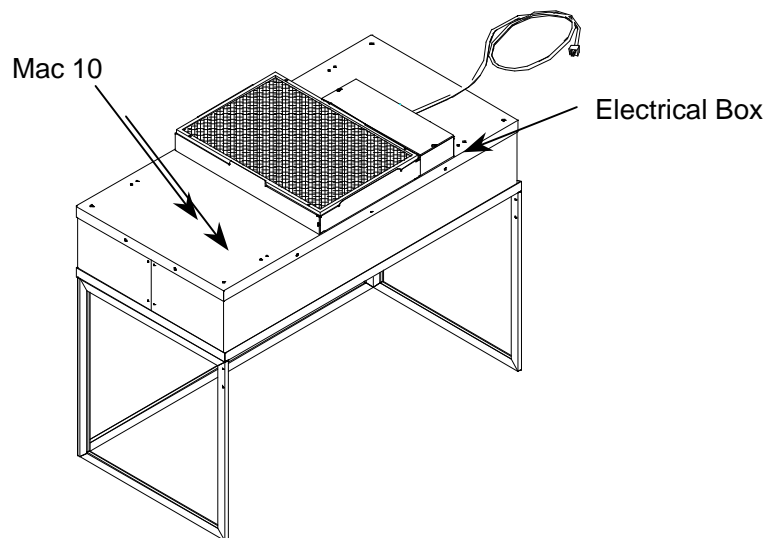


Figure 6 - Mac 10 Installation

Step 6: Attachment of the Front Panel.

The front panel is attached to both the Mac 10 and the Stand. 2 ea ¼-20 x ½ machine screws are installed in the front nutserts, and 4 each screw are installed in the nutserts on the front of each side window. Remove all the hardware a set aside. Place the front panel over the Mac 10 and install the screws into the two threaded holes in the front of the Mac 10 and the four holes on the side windows. Finally plug the two power cords from the front panel into the receptacles on the side of the electrical box. The VLF-797 is now ready for operation. With the electrical switch in the off position plug the power cord into a 15 Amp or higher receptacle.

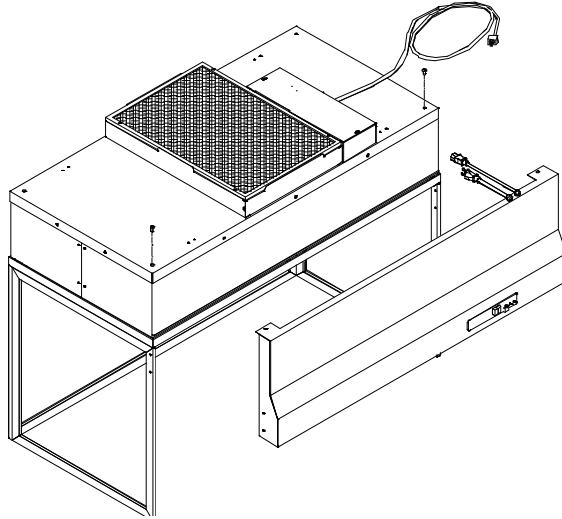


Figure 7 - Electrical Panel Installation

Installation of Optional Shroud

After Step 5, install the shroud over the Mac 10 unit. The shroud will slide into place on the Mac 10 Support Frame. At the bottom end of the Shroud there are sheet metal slots that mount the Shroud to the Support. To install the Front Panel, follow the instructions in Step 5.

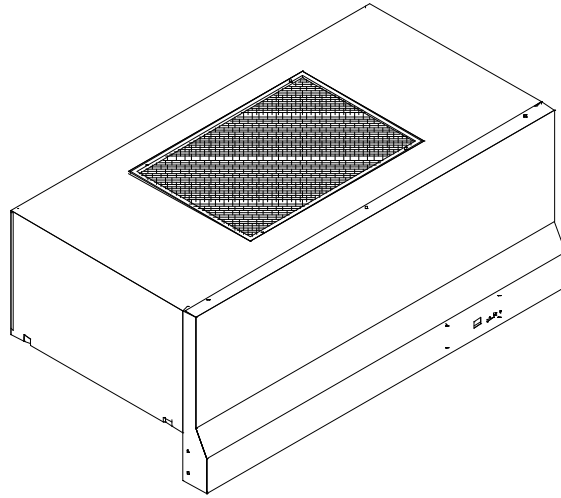


Figure 8 - Enlarged Shroud

III. SERVICE: Cleaning the MAC 10 VE5 Prefilter

WARNING!

Disconnect the unit from the electrical power source before attempting any service.

Tools Required: None

Note: To keep the filter in top operating condition, washing the foam prefilter is recommended every three to six months.

- a. Switch the ON-OFF switch to the off position.
- b. Remove the prefilter from the snap-in frame. (See Figure 8)
- c. Clean the prefilter by hand washing in water with a mild detergent or by using a vacuum cleaner. Allow prefilter to dry completely before replacing.
- d. Reassemble by reversing the above steps.

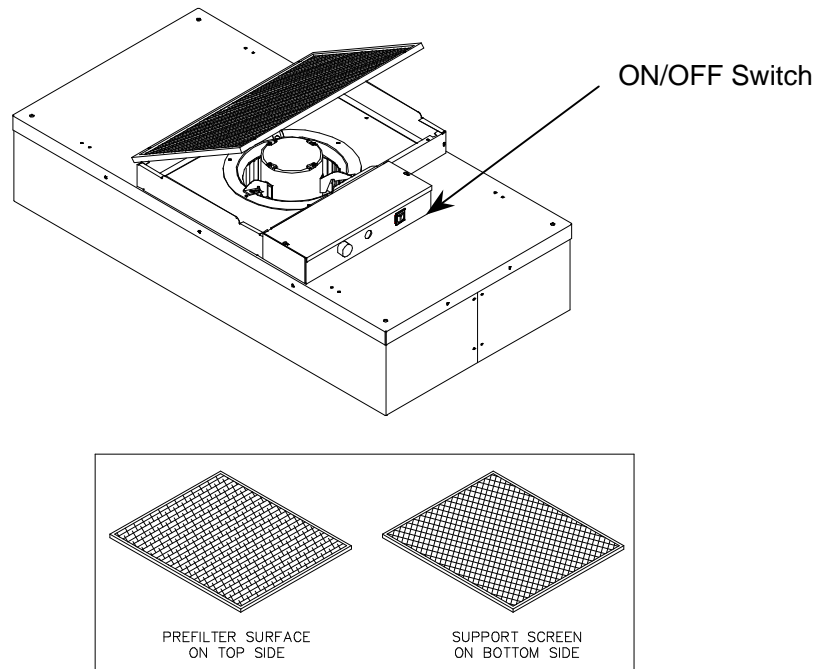


Figure 9 - Prefilter Cleaning

IV. SERVICE: Removal and Replacement of the HEPA/ULPA Filter (Standard Unit)

WARNING!

Disconnect the unit from the electrical power source before attempting any service.

Tools Required: Phillips Head Driver

- a. Remove unit from the VLF-797 stand. This requires the removal of the Front Panel Assembly prior to lifting the Mac 10 from the stand.
- b. Remove the 10 screws holding the HEPA/ULPA filter to the lid assembly.
- c. Lift the lid assembly off the HEPA/ULPA filter (see Figure 92). Discard the used filter as per requirements of the applicable regulations.

Note: Before replacing with a new HEPA/ULPA filter, carefully inspect the new filter for any visible damage. Replace with the new HEPA/ULPA filter and assemble by reversing the above steps.

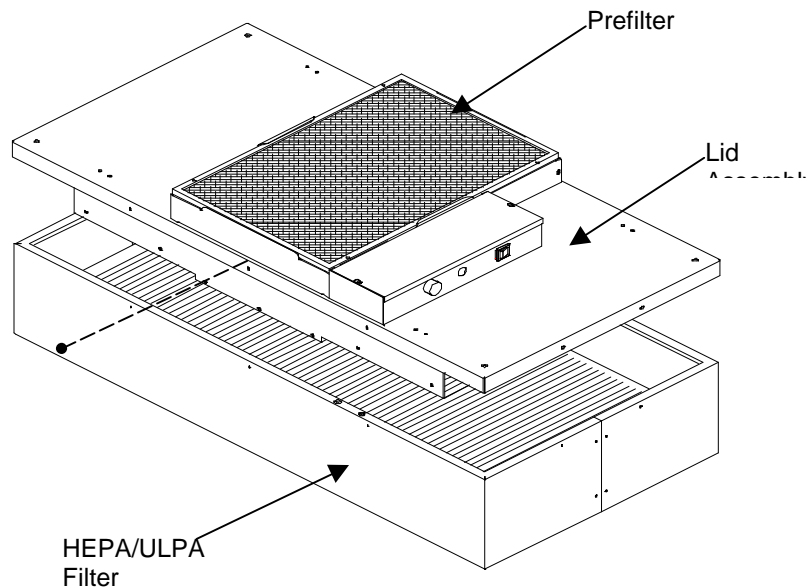


Figure 10 - Filter Replacement

V. **SERVICE: Removal and Installation of the Motor**

WARNING!

Disconnect the unit from the electrical power source before attempting any service.

WARNING!

Electrical service should be performed by licensed electricians or authorized ENVIRCO service technicians.

Tools Required:

Phillips Head Driver

3/8" (10mm) Hex Head Wrench

Pliers

5/32"(0.40 cm) Allen wrench

- a. Switch the ON-OFF switch to the off position.
- b. Remove the prefilter off the prefilter frame
- c. Loosen the electrical box cover screws (2), and slide/lift off cover.
- d. Make note of all wire locations for reinstallation later.
- e. Disconnect the two brown wires from the capacitor, using a pair of pliers.
- f. Disconnect the motor wiring from the rotary switch and rocker switch or speed control and rocker switch and remove the grommet from the motor leads. Save this grommet for reinstallation.
- g. Remove the six screws to free the venturi ring and remove the motor/blower assembly from the lid assembly. If using a power driver, set the unit to a low torque setting to avoid stripping the sheet metal screws. (See Figure 10)
- h. Using a 5/32"(0.40 cm) Allen wrench remove the blower wheel from the motor shaft. Remove motor from the venturi ring using a hex wrench.
- i. Replace with the new motor and reassemble by reversing the above steps. Set the spacing between the venturi ring and the blower wheel at 0.06"(0.15 cm) clearance.

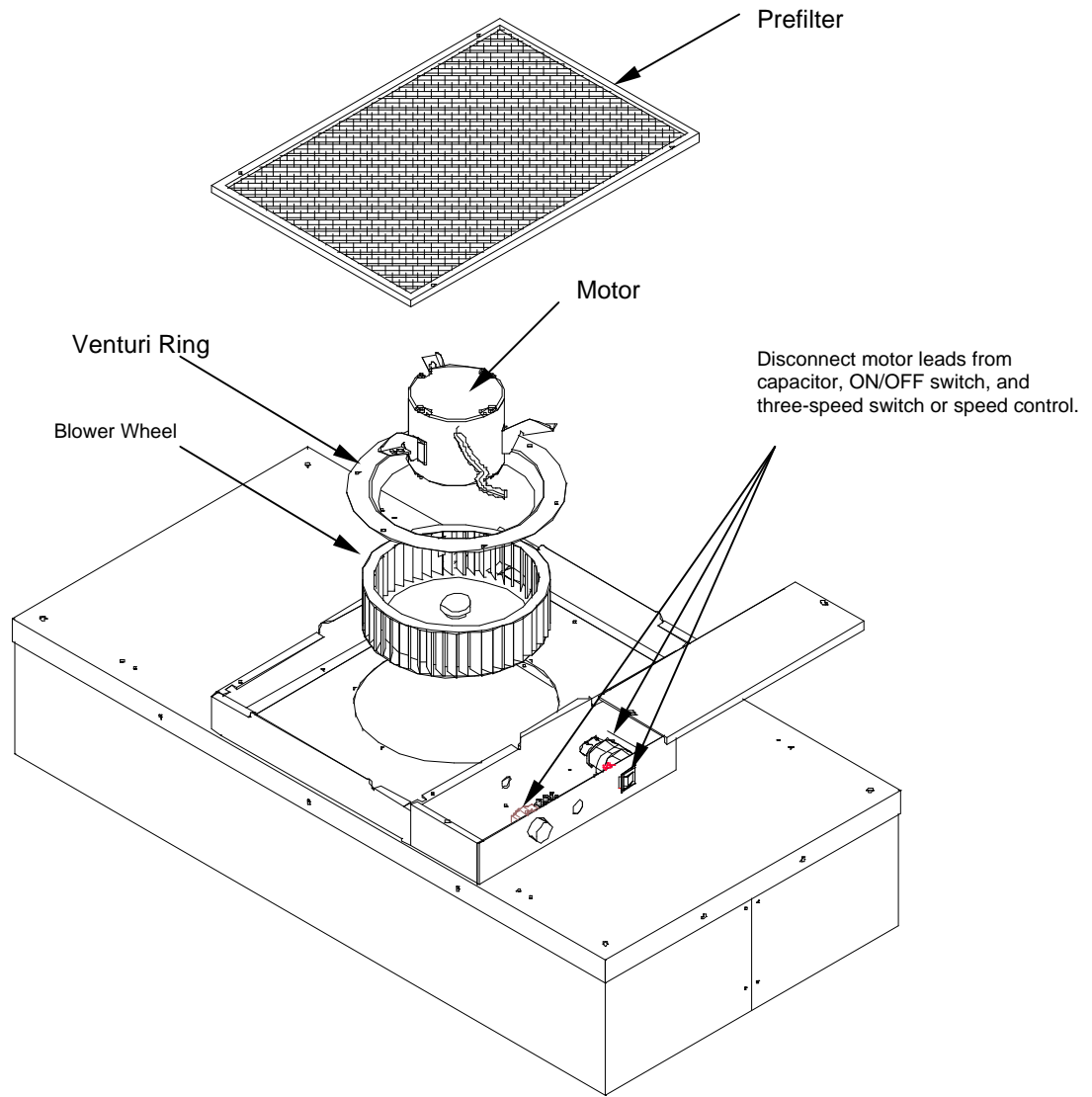


Figure 11 - Motor Replacement

VI. ON/OFF Switch - Speed/Airflow Adjustment

- a. All VLF-797 units are equipped with a touch pad controller. The touch pad controls the ON/OFF, unit speed, fluorescent lamp and the optional UV lamp.
 - i. Fan ON/OFF: the fan membrane switch controls the fan, when the fan is operating the light will be illuminated green.
 - ii. Speed Control Operation: The speed of the motor is controlled using the touch pad controller. Using the up and down arrows on the touch pad the motor speed can be increased and decreased. The digital read out indicates what percentage of full RPM the unit is operating at. There is no reference between the digital read out and airflow velocity. (IE 90 on the digital read out is not equal to 90 fpm)
 - iii. Fluorescent Light ON/OFF: the Fluorescent membrane switch controls the light, when the light is on the LED is illuminated red.
 - iv. Optional UV Light ON/OFF: the UV light membrane switch controls the light, when the light is on the LED is illuminated red. When the UV light is turned ON the fan is automatically turned off. Operation of the UV light is only approved for an unoccupied cabinet with the UV-shield in place.
 - v. Digital Display:



VII. Trouble Shooting:

a. Low Air Velocity

- i. Check prefilter media; replace or clean as necessary.
- ii. Adjust variable speed for higher blower output.
- iii. Check power supply for proper voltage, amperage and distribution frequency.
- iv. Replace HEPA/ULPA filter if the air velocity remains low.

b. High Air Velocity

- i. Adjust variable speed control for lower blower output.

c. Non-Laminar Flow and/or Excessive Contamination

- i. Insure that no large obstructions are upstream of airflow pattern.
- ii. Determine that no other air-moving devices are operating in or around clean room, which disrupt room's airflow pattern.
- iii. Check air velocity and if low, conduct the "Low Air Velocity" procedure outlined above.
- iv. Conduct smoke and photometer test on HEPA filter. Seal or replace HEPA filter as necessary.

VIII. **MAC 10 VE5 Wiring Diagrams**

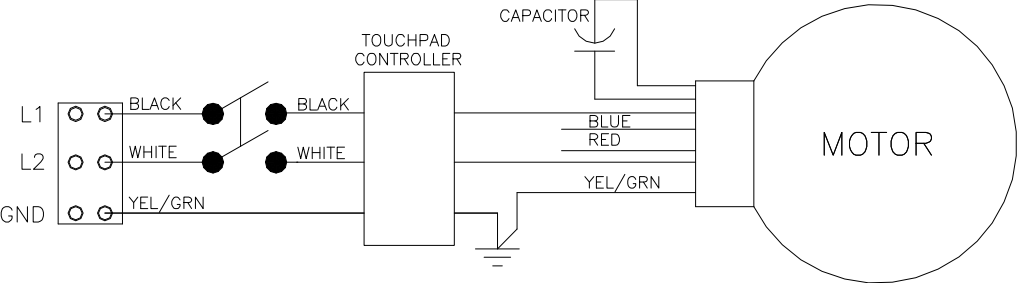


Figure 12 - Wiring Diagram

IX. VLF 797 Replacement Parts List:

Description	Quantity Per unit	ENVIRCO Part Number	
		115V 60 Hz	220V 50 - 60 Hz
Prefilter	1	62981-001	62981-001
Motor	1	63764-001	63764-002
Capacitor	1	61485	61485
ON/OFF Switch	1	63739-002	63739-002
Touch Pad Control	1	64048	64048
3' Fluorescent Lamp	1	63989-001	63989-001
Filter (HEPA)	1	69514-006	69514-006
Filter (ULPA-Optional)1	69514-007		69514-007

Optional Accessories:

Enlarged Shroud
UV light

Replacement parts are available through your authorized ENVIRCO representative. If you cannot locate a representative in your area, contact our Parts Department at:

ENVIRCO

101 McNeill Road
Sanford, NC 27330
Tel: (919) 775-2201
Tel: (800) 884-0002
Fax: (800) 458-2379
Email: info@envirco.com

Option UV lamp handling

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X. LIMITED WARRANTY

ENVIRCO CORPORATION (“ENVIRCO”) warrants the equipment will be free of defects in materials and workmanship under normal use for a period of three (3) years. The HEPA filter shall only be warranted against loading for a period of two (2) years when operated in cleanroom conditions. ENVIRCO’s sole obligation under this warranty is to repair or replace any parts of the equipment, which are defective for a period of three (3) years from the invoice date, provided that the repair or replacement is actually performed within the three (3) year period from the invoice date. The buyer agrees to assume any incidental expenses including but not limited to the cost of transporting the defective equipment to ENVIRCO’s repair facility. The buyer’s sole remedy under this limited warranty is the repair or replacement of any defective part of the equipment. ENVIRCO DISCLAIMS ANY IMPLIED WARRANTIES INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. In no event shall ENVIRCO be liable for punitive, incidental, or consequential damages arising out of this sale, including, but not limited to damage to persons or property, loss of use, loss of time, inconvenience, equipment rental, loss of earnings or profit or any other commercial loss. This warranty excludes certain expendable items such as light tubes, prefilters, etc. ENVIRCO expressly disclaims and excludes from this warranty any responsibility for equipment failures and/or defects attributable to improper maintenance, abuse, accident or modification of the equipment (such as application of an adjustable frequency drive).

XI. TESTING

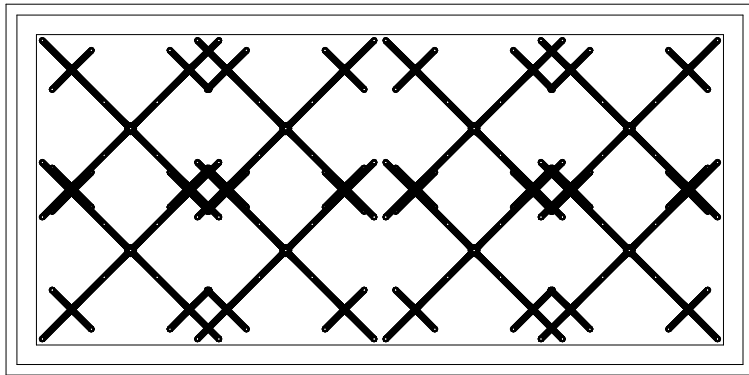
Each MAC 10 VE5 filter unit is thoroughly tested at the factory before shipment. However, because of the “rigors” of shipping, ENVIRCO encourages its re-test after installation.

ENVIRCO recommends that the customer contact an independent organization, with technicians trained and experienced in performance evaluation and maintenance of clean air equipment.

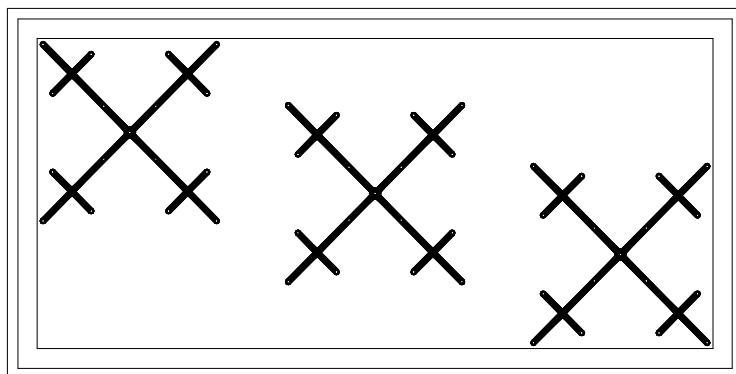
Some of the testing procedures performed on the MAC 10 VE5 include PS challenge of HEPA filters to assure specified performance, along with air velocity measurement and adjustment tests.

Recommended Testing

All units that are airflow tested at Envirco are tested using a Shortridge *Airdata Multimeter 800 series* with a Velgrid head. The recommended method of reading is to place one corner of the Velgrid head 1-1/4” from the corner of the filter face and then take four reading evenly spaced along the four foot side, then repeat these reads for the other long side. This gives a total of eight reading to test the unit. All advertised data is based on using the Velgrid with 8 readings (128 velocity points). Envirco recognized the using 8 reading during a cleanroom start-up may be time consuming and recommends using 3 Velgrid readings taken on a diagonal, as shown below.



Recommended Testing – 8 readings with a Velgrid



Factory Approved Testing – 3 readings with a Velgrid