

IMPORTANT SAFETY INSTRUCTIONS
READ AND SAVE THESE INSTRUCTIONS

Proprietary Notice	Safety Notice	
This manual pertains to proprietary devices manufactured by Terra Universal, Inc. Neither this document nor any portion of it may be reproduced in any way without prior written permission from Terra Universal.	A thorough familiarity with all operating guidelines is essential to safe operation of the product. Failure to observe safety precautions could result in poor performance, damage to the system or other property, or serious bodily injury or death. The following symbols are intended to call your attention to two levels of hazard involved in operation.	
Terra Universal makes no warranties applying to information contained in this manual or its suitability for any implied or inferred purpose. Terra Universal shall not be held liable for any errors this manual contains or for any damages that result from its use.	 CAUTION	Cautions are used when failure to observe instructions could result in significant damage to equipment.
	 WARNING	Warnings are used when failure to observe instructions or precautions could result in injury or death.
The information presented here is subject to change without notice.		

FFU Specifications	
Size:	2'x4'
Housing:	White powder coated cold-rolled steel or 304 stainless steel
HEPA Filter:	99.97% efficient on removal of particles 0.3 microns and larger.
Pre-Filter:	20" x 20" x 1" – 30% efficient ASHRAE rated.
Impeller:	Forward-curved centrifugal type factory balanced. Entire motor/blower assembly is removable from top of housing for service.
Face Grille:	Perforated anodized aluminum or 304 stainless steel
Velocity:	90 FPM or higher
Noise Level:	40 dBA (measured at 30" from filter face)
Weight:	170 lbs. shipping weight
Power:	1/3 HP motor; 120V/230V, 50/60Hz, 4.128 Amps

Specification Notes:

- All FFU data is based on a standalone unit using 1" prefilter and clean filters.
- Data will vary depending on filter media and configurations with other products/systems, such as ductwork or hoods.

1.0 Installation

The Fan/Filter Unit is designed to fit on top of a Terra standard 2' x 4' clean room ceiling grid. It includes a threaded fixture at each corner to accommodate four eye-bolts (not provided) that can be used to assist in positioning the unit.

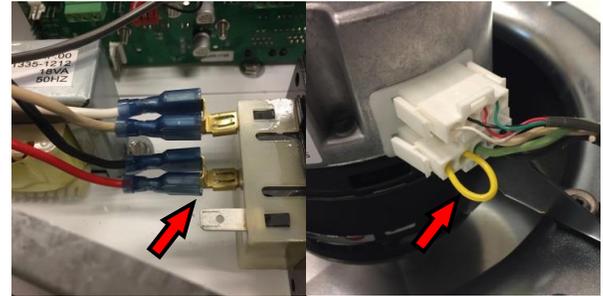
 **WARNING: To reduce the risk of fire, electric shock, or injury to persons, observe the following:**

- Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
- Before servicing or cleaning unit, or replacing a filter, switch power OFF at the service panel and lock the service disconnecting means to prevent power from being accidentally switched on. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.
- When the removal/disconnection of either filter is required due to service or component replacement, the replacements are to be remounted as previously installed.
- Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction. All metal components must be properly grounded.
- When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

2.0 120V vs. 220V Configuration

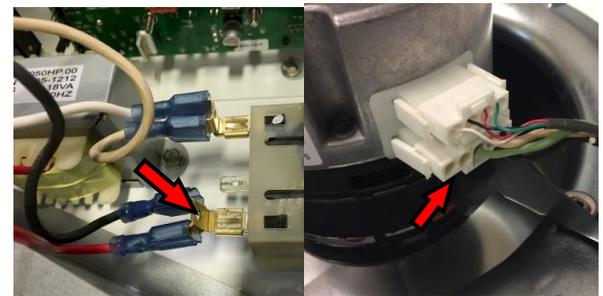


CAUTION: Double check your FFU is configured for the correct voltage. Connecting the motor to the wrong voltage can permanently damage and break the motor. The FFU is pre-configured for 120V. It can be easily reconfigured to 230V.



120V Configuration

- Black and Red wires are connected to the same terminal.
- Yellow Jumper Cable is installed.



220V Configuration

- Black and Red wires connect to the upper terminal as shown.
- Yellow Jumper Cable is removed.

3.0 Initial Start-Up



WARNING: Keep unit disconnected from power supply during inspection.

Prior to providing power to the unit, check that no damage has occurred during shipping. Conduct a visual check to make sure there are no visible dents or penetrations. If the unit is intact, remove the pre-filter and fan guard screen. Once the battery is plugged in, it will automatically start charging and take 1.5 – 2 days to fully charge.

To start unit, plug the UPS into a live AC wall outlet and then press and hold the **POWER** button for about one second. If there is no utility power, you can "cold-start" the UPS (turn it ON and supply power for a limited time from its batteries) by pressing and holding the **POWER** button for about two seconds (alarm will beep once after interval has passed).



Do not unplug the UPS to test its batteries. This will remove safe electrical grounding and may introduce a damaging surge into the network connections.

4.0 Operation

The unit consists of a 1/3-HP electronically commutative motor driving a forward-curved centrifugal impeller. Air is drawn into the unit through a pleated pre-filter and in turn to an insulated chamber where it is then directed to an exit HEPA filter with a built-in diffuser. **The battery system provides approximately 1-2 hours runtime depending on FFU speed setting.** The external battery can be "hot-swapped" (safely removed or swapped without shutting down the UPS).

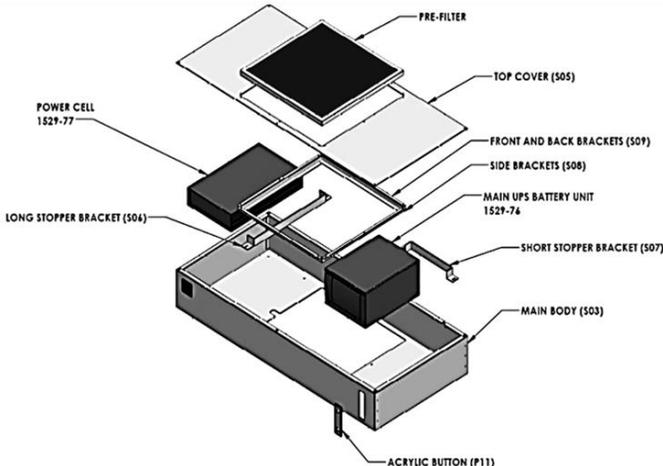
The unit can also be equipped with a 3/8"-diameter challenge port, which can be used to take differential pressure measurements to monitor filter performance or insert aerosols for leak-test certification. Port is capped when not in use.



Indicator Lights	
 	<p>"Output Load Level" LEDs: These multicolored LEDs indicate the approximate electrical load of equipment connected to the UPS's AC outlets: green (light load), yellow (medium load), and red (overload). If the red LED is illuminated continuously or flashing, clear the overload immediately by unplugging some of the equipment from the outlets until the yellow or green LED illuminates.</p> <p>-Any overload that is not corrected by the user immediately may cause the UPS to shut down and cease supplying output power in the event of a blackout or severe brownout.</p>
	<p>"Power" LED: This green LED lights continuously when the UPS is ON and supplying connected equipment with AC power from a utility source. The LED flashes and an alarm sounds (4 short beeps followed by a pause) to indicate the UPS is operating from its internal batteries during a blackout or a severe brownout.</p>
	<p>"Voltage Correction" LED: This green LED lights continuously whenever the UPS is automatically correcting high or low AC voltage on the utility line without using the battery power. The UPS will also emit a slight clicking noise.</p>
	<p>"Battery Warning" LED: This LED lights yellow and an alarm sounds intermittently after self-test is initiated to indicate the UPS batteries need to be recharged or replaced.</p>
	<p>"Battery Charge" LEDs: When the UPS is operating from utility power, these LEDs indicate the approximate charge state of the UPS's internal batteries: red indicates the batteries are beginning to charge; yellow indicates the batteries are roughly midway through charging; and green indicates the battery are fully charged.</p>
	<p>Silence or "mute" UPS alarms: Briefly press and release the MUTE/TEST button.</p> <p>-Continuous alarms (warning to immediately shut down connected equipment) cannot be silenced.</p>

5.0 Cleaning and Maintenance

 **WARNING: Disconnect from power supply before servicing unit or replacing filters. When servicing or replacing either filter, the new filter is to be installed in the same manner as the filter it replaces.**



The scheduled maintenance of the unit depends on the installed location and consists of cleaning or changing the pre-filter and the HEPA filter. It is recommended that the pre-filter be inspected and cleaned every three months or sooner depending on the cleanliness of the external environment. The HEPA filter cannot be cleaned and must be replaced when the air velocity falls below 70 feet/min.

Changing the HEPA filter requires removal of the unit from the ceiling grid. Place the unit on a flat work surface and remove the 10 sheet metal screws that hold the HEPA filter to the case. Replace the filter with a new one and secure it to the case with the same screws before placing it back onto the ceiling grid.

6.0 Warranty

Products Manufactured by Terra: Terra Universal, Inc., warrants products that it manufactures to be free from defects for a period of 12 months for parts and 90 days for labor, commencing from the date of shipment. This limited warranty covers parts and labor, but not transportation and insurance charges. Terra's sole responsibility is to repair or replace, at its option, any part of the product that proves defective or malfunctioning during this time limit. In some cases, components incorporated in Terra Universal products are covered by additional warranties from component manufacturers; obtain specific information from Terra sales representatives. Repairs may be completed by 3rd party service agents approved by Terra Universal. Terra Universal reserves the rights to limit this warranty based on a service agent's travel, working hours, the site's entry restrictions and unobstructed access to serviceable components of the product. This warranty is void if the equipment is abused or modified by the customer, is operated outside Terra's operating instructions or specifications, or is used in any application other than that for which it is specified. This warranty does not include routine maintenance or service procedures, shipping damage, nor damage from misuse, intentional or unintentional abuse, neglect, natural disasters, or acts of God.

Products Manufactured by Others: Terra Universal, Inc., warrants that, to the best of its ability, Terra's representations of products that are manufactured by others reflect the manufacturer's representations, subject to change without notice. Sole warranty for these products is the original manufacturer's warranty that is passed forward to the purchaser and constitutes the customer's sole remedy for these products. Detailed warranties for distributed products are available through Terra sales representatives.

Freight Shortage or Damage: Upon receipt of any equipment from Terra Universal, Inc., customer shall immediately unpack and inspect for damage or shortage. The customer shall not accept a damaged package or a short shipment until the carrier makes a "damage or shortage" notation on both the carrier's and customer's copy of the freight bill or delivery receipt. Service title passes when the shipment is loaded, so customer is responsible for filing and collecting a freight claim. Any replacement products must be ordered and paid for separately. For Terra's "Policy and Procedures for Returning Goods," see Terra's Internet site: www.TerraUniversal.com.

Generally, customers can improve the chance of collecting on a freight claim by following these procedures: 1) formally requesting that the carrier inspect the shipment immediately upon suspecting damage or shortage to verify condition; 2) notifying the carrier upon discovery of concealed damage and requesting an inspection within 15 days of receipt, both in person or phone and following up via mail; 3) keeping the shipment as intact as possible, including retaining original packaging materials and keeping the product as close to the original receiving location as possible; 4) holding salvage for disposition by the carrier.

All Claims: Terra Universal expressly disclaims all other warranties, expressed or implied or implied by statute, including the warranties of merchantability or fitness for intended use. Terra Universal is not responsible for consequential or incidental damages arising out of the purchase or use of the products supplied by Terra Universal. Terra Universal is not liable for damage to facilities, other equipment, products, property or personnel of others, or of their agents, suppliers, or affiliated parties, which is caused or alleged to have been caused by products supplied by Terra Universal. In any event or series of events, Terra Universal's total liability for any and all damages whatsoever is limited to the lesser of the actual damages or the original invoice cost of the items alleged to have caused the damage. The customer's sole and exclusive remedy for any cause of action whatsoever is repair or replacement of the non-conforming products or refund of the actual purchase price, at the sole option of Terra Universal. All claims must be made in writing within 90 days of the date the product was shipped. Any claims not made within this time limit shall be deemed waived by the customer. Terra Universal is not responsible for any additional costs of repair caused by poor packaging or in-shipment damage during return.

Warranty Returns: All warranty returns must be authorized in advance by Terra Universal and approved under an RMA. Unless approved in advance for good reason, all returns must be in original condition, including all manuals, and must be packaged in original packaging materials. All returned goods are to be shipped to Terra Universal, freight prepaid at customer's expense. See Terra's "Policy and Procedure for Returned Goods."

For more details and operating instructions scan the QR code to the right for Terra's comprehensive FFU manual.

