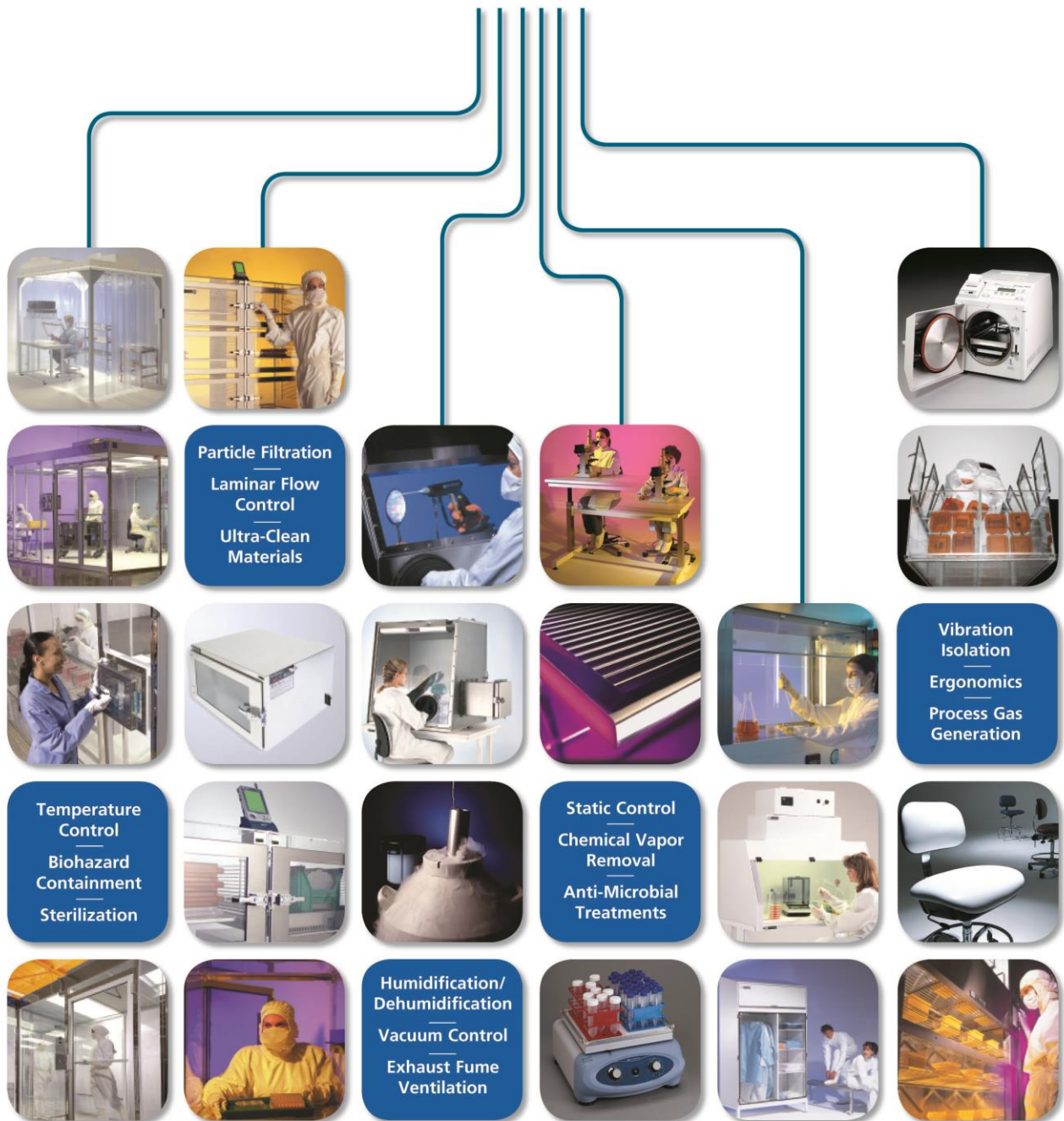


# PureFlow™ Laminar Flow Transport Cart

© Copyright 2017 Terra Universal Inc. All rights reserved. • Revised June 2017

Your Comprehensive  
 Equipment Source





---

## TABLE OF CONTENTS

---

1.0	Description .....	3
2.0	Components and Controls .....	4
2.1	PureFlow Transport Cart.....	4
2.2	Uninterruptable Power Supply (UPS).....	6
2.3	Power Cell (Optional) .....	7
3.0	Installation Procedures.....	7
3.1	Unpacking .....	7
3.2	Installing the Shelves .....	7
3.3	Installing the UPS and Power Cell .....	8
4.0	Operating Procedures.....	9
4.1	Charging the Batteries .....	9
4.2	Initial Start-Up.....	9
4.3	Transporting Materials .....	9
4.4	Standalone (Battery-Powered) Operation .....	10
5.0	Maintenance Procedures.....	10
5.1	Cleaning.....	10
5.2	Filter Replacement .....	11
6.0	Specifications.....	12
7.0	Warranty.....	13



## Proprietary 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.

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.

## Safety Notice

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.



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.

## 1.0 Description

The PureFlow™ Laminar Flow Transport Cart is designed to provide a continuous vertical laminar flow of HEPA- or ULPA-filtered air during the transportation of sensitive parts or materials. The stainless steel construction and static-dissipative PVC windows are non-shedding and easy to clean, ensuring a particle-free environment that meets the strictest cleanliness requirements.

The fan/filter unit (FFU) includes a 700 CFM impeller blower (average flow at 100 FPM with filter load) mounted in a powder-coated steel housing with a plenum design that optimizes uniform air velocity across the entire face of the filter. A HEPA (high efficiency particulate air) filter installed inside the housing is rated 99.99% efficient at 0.3um particles. The filtration medium consists of micro porous polyurethane mini pleats held in place by strong, rigid plastic separators that keep the medium from nesting. This design channels airflow with optimal efficiency to reduce resistance. The filter is sealed within an aluminum frame with a fire-retardant, non-outgassing adhesive. On an optional basis, an ULPA (ultra-low penetration air) filter, rated 99.9995% efficient at 0.12um particles, may be substituted for the HEPA filter.

The Uninterruptable Power Supply (UPS) positioned beneath the cabinet allows the system to be disconnected from building power without disrupting the fan/filter unit. A rechargeable battery inside the power supply unit provides up to 30 minutes of sustained FFU operation while the cabinet is transported to its new destination.

The power supply unit can be augmented by connecting a Power Cell, which greatly prolongs the battery life of the system. Various battery capacities are available, with the longest lasting Power Cell capable of over 4 hours of independent operation with proper air speed management.



Figure 1. Custom PureFlow system with internal partition and filter backpressure gauge



## 2.0 Components and Controls

### 2.1 PureFlow Transport Cart

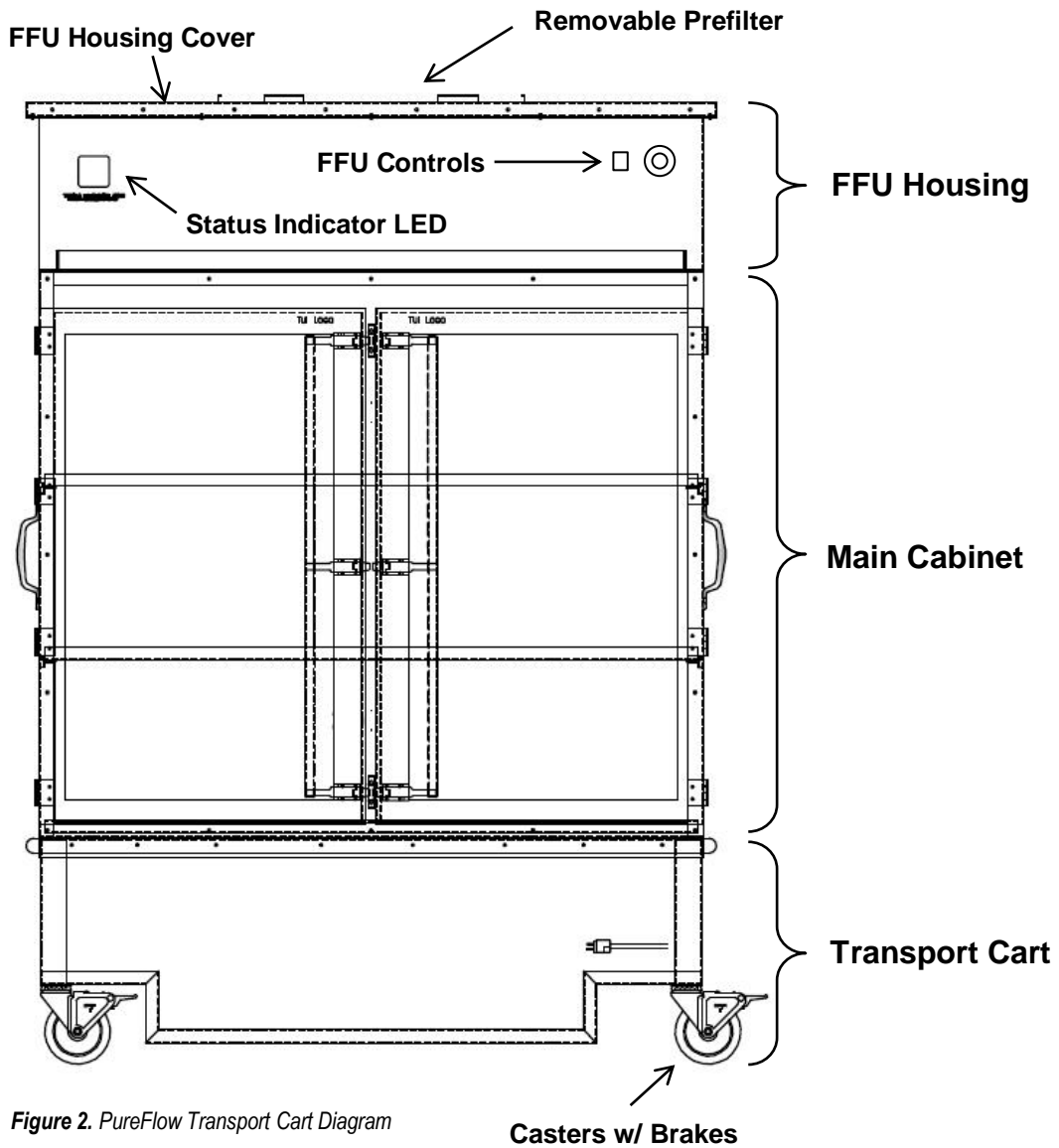


Figure 2. PureFlow Transport Cart Diagram



# PureFlow Transport Cart



Figure 3. FFU Power Switch and Speed Dial



Figure 4. TUI Status Indicator LED



Figure 5. FFU Power Cable emerges on rear of cabinet

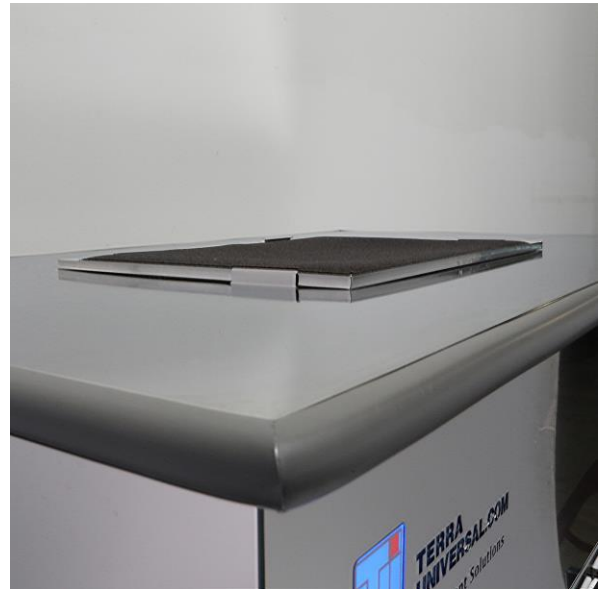


Figure 6. Top cover of FFU housing with prefilter installed









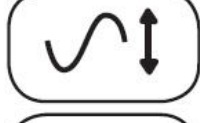


## 2.2 Uninterruptible Power Supply (UPS)



Figure 7. Uninterruptible Power Supply (UPS)



Figure 8. Rear view of UPS

-  Power Button
-  Mute/Test Button
-  Output Load LED
-  Power Output LED
-  Voltage Correction LED
-  Battery Warning LED
-  Battery Level LED

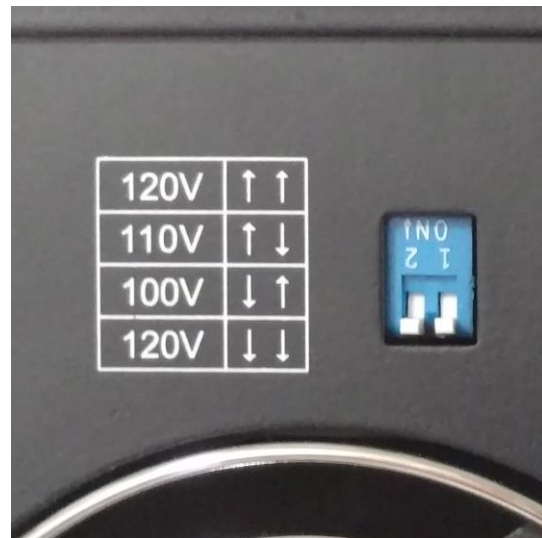


Figure 9. DIP switch settings on rear of UPS



## 2.3 Power Cell (Optional)



Figure 10. 3 hour Power Cell



Figure 11. Rear view of 3 hour Power Cell



Power Cells are fully controlled by the UPS and do not have any buttons or indicators.

## 3.0 Installation Procedures

### 3.1 Unpacking

The PureFlow cabinet, transport cart, and fan/filter unit are shipped as a single unit. The power supply and any optional Power Cells will be shipped separately. Uncrate all components, checking to make sure that there is no visible damage incurred during shipment. If damage is found, contact the freight company to file a damage claim immediately.

### 3.2 Installing the Shelves

Shelving is typically shipped separately from the cabinet. Each adjustable shelf is mounted to the interior rails using 6 clips. Installation of the shelves will require at least two people.

1. Place all three shelves in the cabinet.
2. Lift the first (top) shelf to the desired height.
3. Insert clips into the 6 mounting rails on the sides, back and front of the cabinet at the desired level.
4. Gently rest the shelf on the installed clips.
5. Repeat Steps 2 through 4 for the remaining two shelves



Figure 12. Insert the clips into the mounting rails as shown



## 3.3 Installing the UPS and Power Cell

1. Place the UPS and Power Cell on the platform at the bottom of the transport cart. Do not obstruct the vents on either the UPS or the Power Cell.



**Figure 13.** Correct positioning of the UPS and large 3 hour battery pack

2. Connect the red/black cables to the corresponding connectors on the back of the UPS.
3. Connect the FFU power cable to one of the outlets on the back of the UPS.
4. Coil the excess cable as needed to keep it on the tray.
5. Set the DIP switch to 120V (see **Figure 9**).



**Figure 14.** Correct positioning of the UPS and large 3 hour battery pack





## 4.0 Operating Procedures

### 4.1 Charging the Batteries



If the UPS batteries are left discharged for an extended period of time, they will suffer a permanent loss of capacity.

1. Connect the UPS power cable to a 120V wall outlet.
2. Confirm that one of the Battery Level LEDs is illuminated, indicating the unit is receiving power.
3. For a full charge, wait until the green Battery Level LED is illuminated.

### 4.2 Initial Start-Up



Always connect the system to a power receptacle when starting the fan/filter unit. Never start the blower from battery power alone.

1. Press and hold the Power button on the UPS for 1 second to turn on the system. The unit will beep and the TUI Status Indicator LED on FFU housing will flash to indicate power is being supplied to the FFU.
2. Press the green power switch on the FFU housing to turn on the blower.
3. Turn the Speed Dial clockwise to the high speed setting ("HI").
4. Wait at least 5 minutes for the cabinet to purge any particles that may have settled in the cabinet.
5. Perform a thorough cleaning of the shelves and cabinet walls prior to introducing sensitive materials.

### 4.3 Transporting Materials



Always check to make sure the system is disconnected from the wall outlet before moving the PureFlow cart to avoid damaging the plug and/or power cable.

#### Maximum Transport Time (UPS only): 30 minutes

1. Place the materials in the cabinet and close the doors, ensuring all latches are fully engaged in their respective catches.
2. Set a timer for 30 minutes.
3. Disconnect the UPS power cable from the wall outlet and place the coiled cable on the platform. The UPS will emit 3 beeps intermittently to notify operators that the unit is now operating on battery power. This alarm can be silenced by pressing and holding the Mute button for a few seconds.
4. Start the timer.
5. Unlock all brakes on the transport cart.
6. Maneuver the PureFlow cabinet to its destination using the handles affixed to the sides of the cabinet. Because of the size and weight of the cabinet, it is recommended that two people be in control of the cart at all times, one on each side of the cabinet.
7. When the PureFlow cabinet reaches its destination, lock the wheels and reconnect the UPS power cable to a 120V wall outlet.



## 4.4 Standalone (Battery-Powered) Operation



To extend the service life of the battery, avoid frequent deep cycling (running the unit until the battery is nearly drained).

CAUTION

For PureFlow systems with only the UPS, battery-powered operation should be limited to transporting materials from one part of the facility to another. If the system is equipped with a Power Cell, the PureFlow cabinet can operate on battery power for an extended period of time.

Refer to the original order form for the specified battery life. It is recommended to first perform this procedure as a test of the maximum battery life and use the results to establish operating protocols. When determining the timer settings, be sure to consider the time it takes to move the PureFlow Transport Cart back into position and reconnect it to a wall outlet.

1. Perform the Initial Start-Up procedure.
2. Set a timer for a suitable period of time depending on the processes involved.
3. Disconnect the UPS power cable from the wall outlet and place the coiled cable on the platform. The UPS will emit 3 beeps intermittently to notify operators that the unit is now operating on battery power. This alarm can be silenced by pressing and holding the Mute button for a few seconds.
4. Start the timer.
5. Unlock all brakes on the transport cart.
6. Maneuver the PureFlow cabinet to its destination using the handles affixed to the sides of the cabinet. Because of the size and weight of the cabinet, it is recommended that two people be in control of the cart at all times, one on each side of the cabinet.
7. Lock the wheels of the cart when the PureFlow cabinet reaches its destination.
8. When the timer goes off or the Low Battery alarm is heard (continuous beep, non-mutable), reconnect the UPS to a wall outlet to recharge the battery.



NOTE

It is recommended to fully recharge the battery between uses to avoid interrupting extended processing.

## 5.0 Maintenance Procedures

### 5.1 Cleaning



Bleach will cause pitting on stainless steel surfaces.

CAUTION

Stainless steel may be cleaned with isopropyl alcohol and a dry, clean non-abrasive wipe. Use only light pressure when cleaning. If the outside surface is exceptionally dirty or gritty, lightly swab the surface with a saturated cloth and allow the surfactants to drain away. Avoid rubbing dirt or grit into the surface. Turn the cloth often and replace with a clean cloth frequently. Dry the surface by blotting gently with a clean, dry cloth. For heavy duty cleaning agents or decontamination protocols, check chemical compatibility with the door gasket and other materials before use.



## 5.2 Filter Replacement

The prefilter on top of the cabinet should be replaced periodically depending on the environment and materials that the prefilter is exposed to during daily operations.

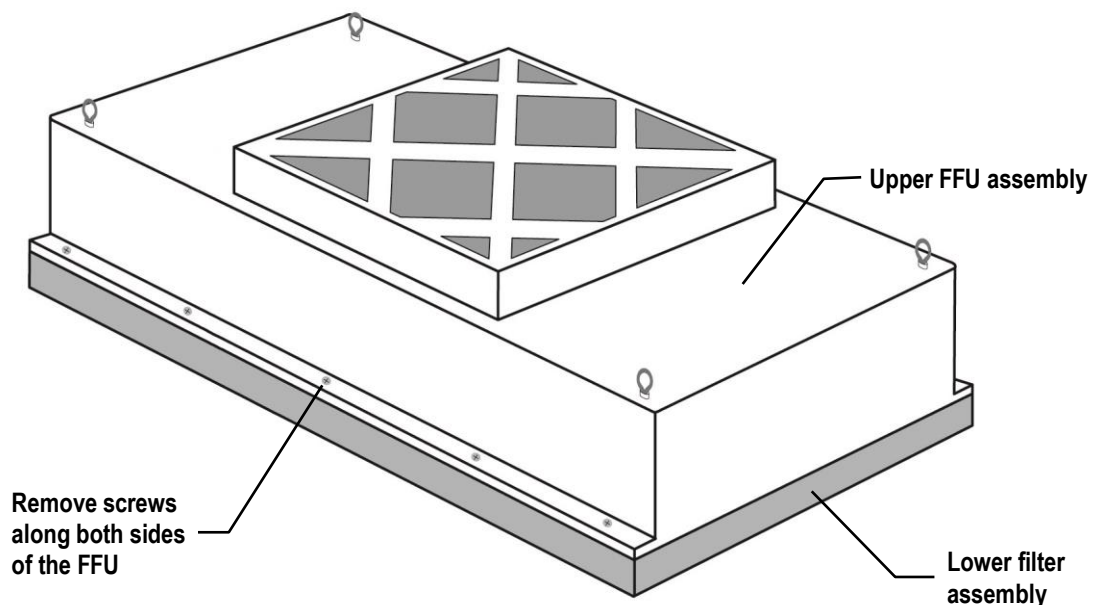
### Replacement Prefilter: #6702-00

The HEPA filter installed inside the FFU cannot be cleaned and will typically last for years depending on the particle levels in the surrounding environment. When the PureFlow Transport Cart is used in an ISO-classified environment, the HEPA filter will often perform sufficiently for a much longer period of time.

However, if airspeed is significantly reduced or the HEPA filter fails to pass certification by an independent certifier, the HEPA filter may need to be replaced. Be sure to verify the proper operation of all other components in the system before attempting to replace the HEPA filter.

### Replacement HEPA Filter: #6601-25

1. Disconnect the FFU power cable from the UPS.
2. Remove the top cover of the FFU housing by removing the screws around the bottom edge, below the polyurethane bumper.
3. Disassemble the 3-prong plug on the FFU power cable and pull the power cable up into the FFU housing.
4. Remove the screws attaching the upper FFU assembly to the lower filter assembly (see diagram below).
5. Lift the upper FFU assembly out of the FFU housing and remove the lower filter assembly.
6. Replace the lower filter assembly, only handling the filter by the aluminum edges.
7. Reassemble the FFU housing by reversing the steps for disassembly.





# PureFlow Transport Cart

## 6.0 Specifications

PureFlow Transport Cart	
Dimensions	52.5"W x 29.5"D x 73"H
Shelf Dimensions	48"W x 24"D
Door Opening	20.75"W x 39"H
Power Requirements	120VAC, 60Hz
Construction/Materials	316 Electropolished Stainless Steel Static-Dissipative PVC (Windows)
Weight	Approx. 525 lbs.

Fan/Filter Unit (EC Motor)	
Dimensions	24"W x 48"D x 13.5"H
Power Requirements	120V, 4.2A, 504W, 50/60Hz, 1Ph
Filter	HEPA, 99.99% efficient for particles 3 microns or greater
Sound Level	Approx. 49 dBA
Weight	Approx. 71 lbs.

Uninterruptable Power Supply (UPS)	
Dimensions	6.75"W x 13.75"D x 10"H
Power Requirements	120VAC, 5.4A, 50/60Hz, 1Ph
Housing Material	Steel
Weight	Approx. 34 lbs.
Operating Temp.	0°C to 40°C
Operating RH	0 to 95%, non-condensing

Power Cell	
Dimensions	17.5"W x 25"D x 5.25"H
Power Output	24 VDC
Housing Material	Steel
Weight	Approx. 139 lbs.
Operating Temp.	0°C to 40°C
Operating RH	0 to 95%, non-condensing



## 7.0 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. 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. 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, breakage of quartz baths after 60 days, 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](http://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."

*Thank you for ordering from  
Terra Universal!*