TERRA UNIVERSAL.COM
Critical Environment Solutions

Terra Universal Product Manual *Document No. 1800-73*

CleanBooth™ Laminar Flow Station

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1. General Information

The laminar flow station is ideal for kitting operations, assembly, screen printers and other free-standing or benchtop processing equipment with the ability to effectively block the inrush of contaminants. The backbone of the system is one or more filter/fan units (FFUs), each with industry-leading low-noise impeller blowers. Horizontal flow versions have the FFUs mounted on the side of the frame. The castered frame positions the FFU behind benchtop or large process equipment for repair operations wherever you need a temporary horizontal laminar flow of filtered air. Following the instructions and recommended maintenance will help insure a long and efficient service life from the unit.

1.1 Part Numbers Covered by this Manual

Part Numbers	Configuration	Width	Depth	Height	Voltage	Airflow Direction
1870-01A	Knockdown	48.25”	26.3”	70.1”	120 V	Vertical
1870-02A	Knockdown	72.5”	26.3”	70.1”	120 V	Vertical
1870-03B	Knockdown	49.25”	49.25”	84.1”	120 V	Vertical
1870-03B-220	Knockdown	49.25”	49.25”	84.1”	220 V	Vertical
1870-04B	Knockdown	96.25”	48.25”	84.2”	120 V	Vertical
1870-04B-220	Knockdown	96.25”	48.25”	84.2”	220 V	Vertical
1870-05A	Knockdown	72.5”	26.3”	70.1”	120 V	Vertical
1870-05A-220	Knockdown	72.5”	26.3”	70.1”	220 V	Vertical
1870-06B	Knockdown	49.25”	50.25”	80”	120 V	Vertical
1870-06B-220	Knockdown	49.25”	50.25”	80”	220V	Vertical
1870-07B	Knockdown	96.25”	48.25”	84.2”	120 V	Vertical
1870-07B-220	Knockdown	96.25”	48.25”	84.2”	220 V	Vertical
1870-08B	Knockdown	96.25”	48.25”	84.2”	120 V	Vertical
1870-08B-220	Knockdown	96.25”	48.25”	84.2”	220 V	Vertical
1870-09B	Knockdown	96.25”	48.25”	84.2”	120 V	Vertical
1870-09B-220	Knockdown	96.25”	48.25”	84.2”	220 V	Vertical
1870-20	Knockdown	48.25”	29.5”	71”	120 V	Horizontal
1870-21	Knockdown	100.5”	29.5”	71”	120 V	Horizontal
1870-22	Knockdown	48.25”	29.5”	71”	120 V	Horizontal
1870-22-220	Knockdown	48.25”	29.5”	71”	220 V	Horizontal
1870-23	Knockdown	72.5”	29.5”	71”	120 V	Horizontal
1870-23-220	Knockdown	72.5”	29.5”	71”	220 V	Horizontal
1870-25	knockdown	102”	29.5”	71”	120 V	Horizontal
1870-25-220	Knockdown	102”	29.5”	71”	220 V	Horizontal

2. Safety

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. 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.	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.	

Critical Operation Conditions

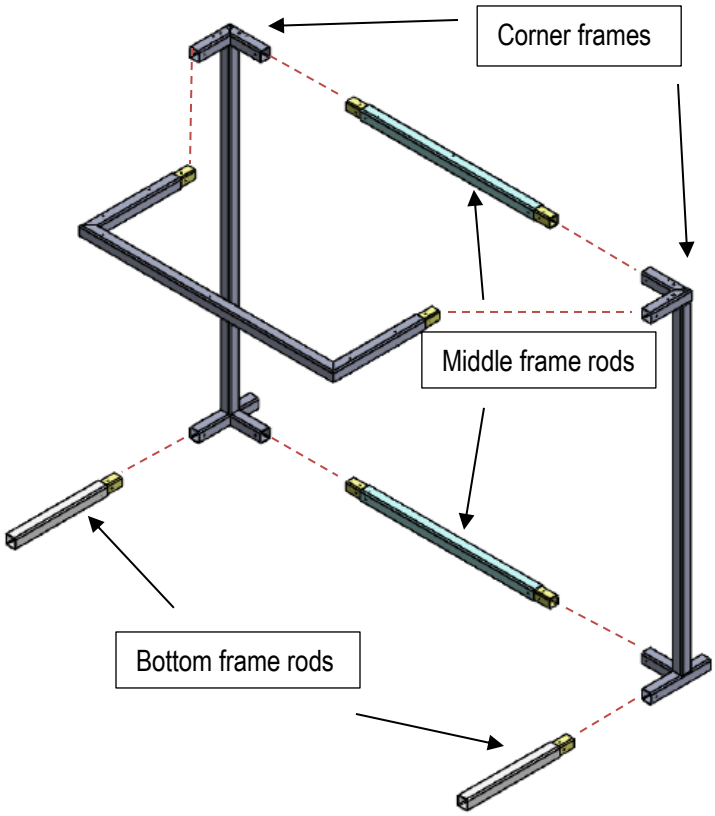
- Because of their panel design, softwall cleanrooms cannot control pressure, humidity or temperature levels inside the enclosure, making them unsuitable for many requirements, including many ISO 5 applications. The flexible curtains can also be more difficult to clean than rigid hardwall panels.

- Please refer to our other cleanrooms if pressure, humidity and/or temperature control or frequent cleaning, sterilization is required.

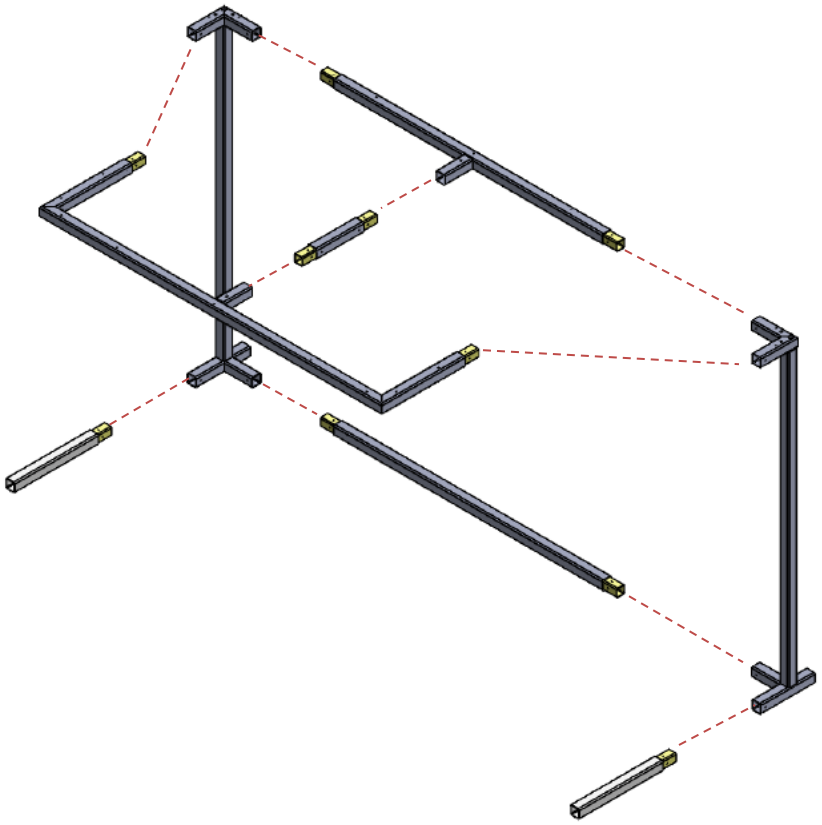
3. Installation

Step 1:

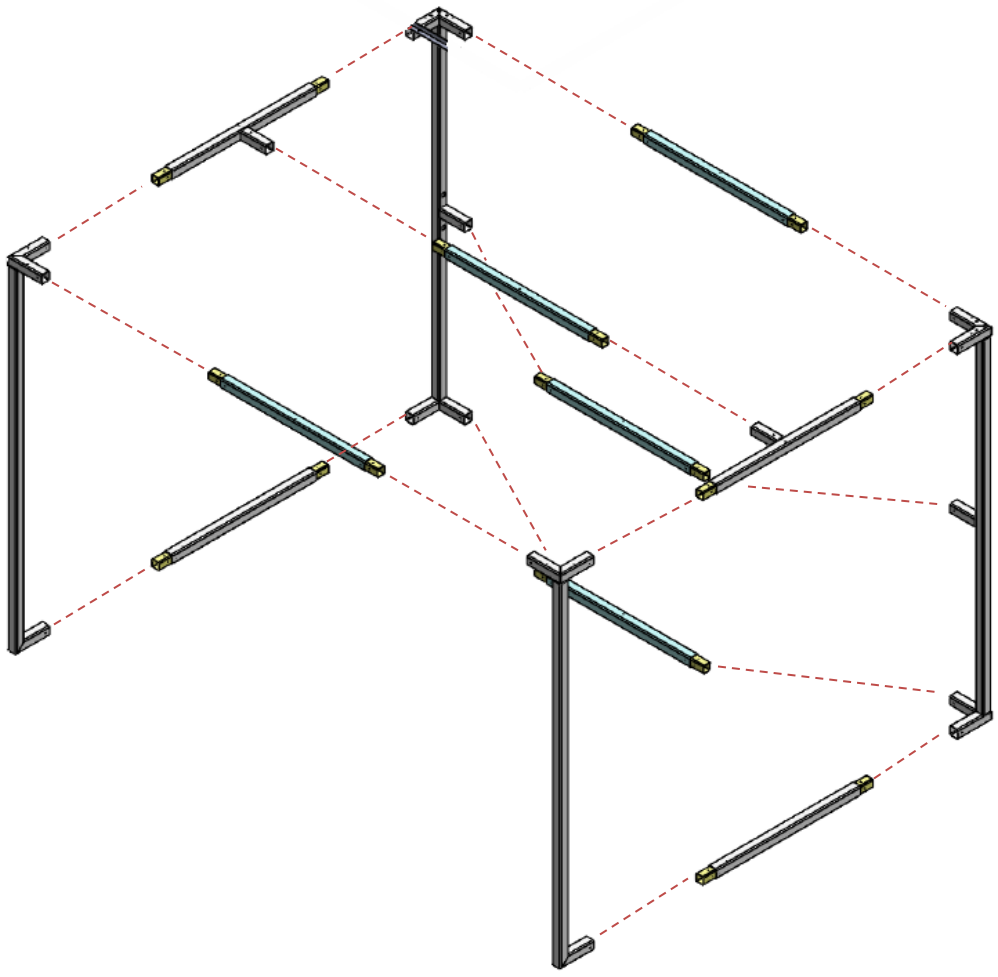
a. Part number 1870-01A: Connect both corner frames pieces with middle frame and bottom frame rods.



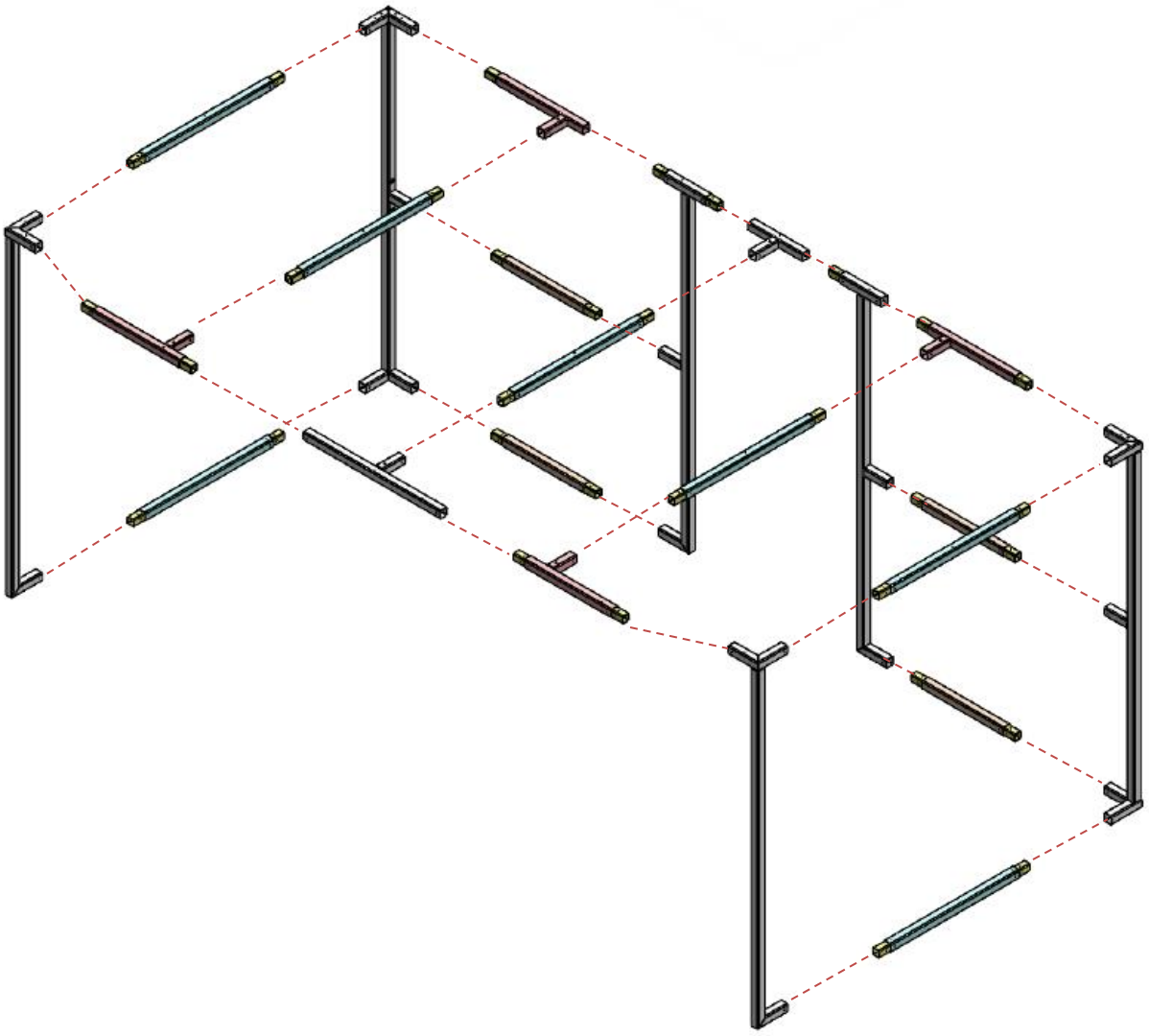
b. Part numbers 1870-02A & 1870-05A: Connect indicated parts shown.



c. Part numbers 1870-03B & 1870-06B: Connect indicated parts shown.

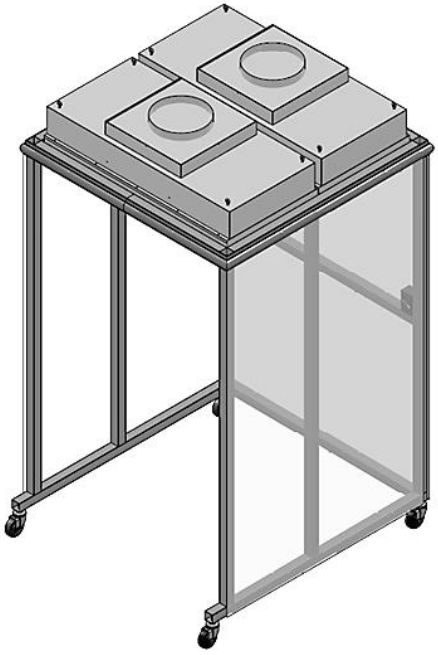


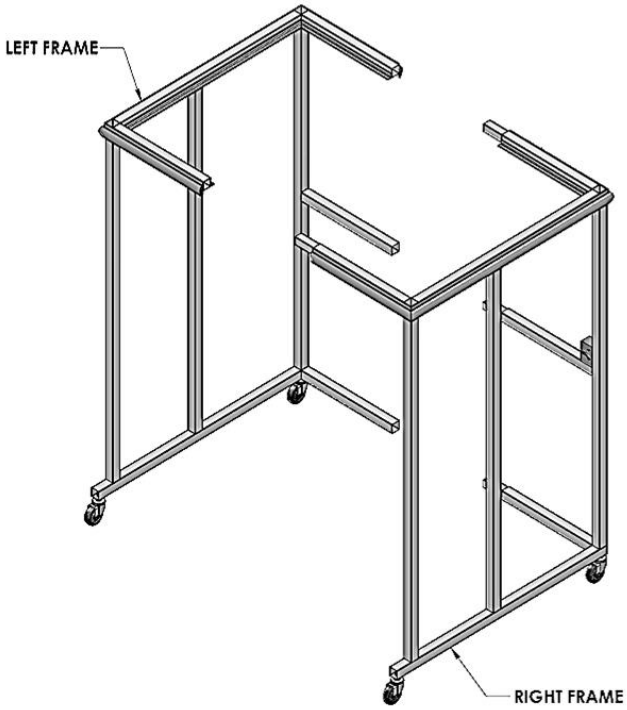
d. Part numbers 1870-05B, 1870-07B, 1870-08B & 1870-09B: Connect indicated parts shown.



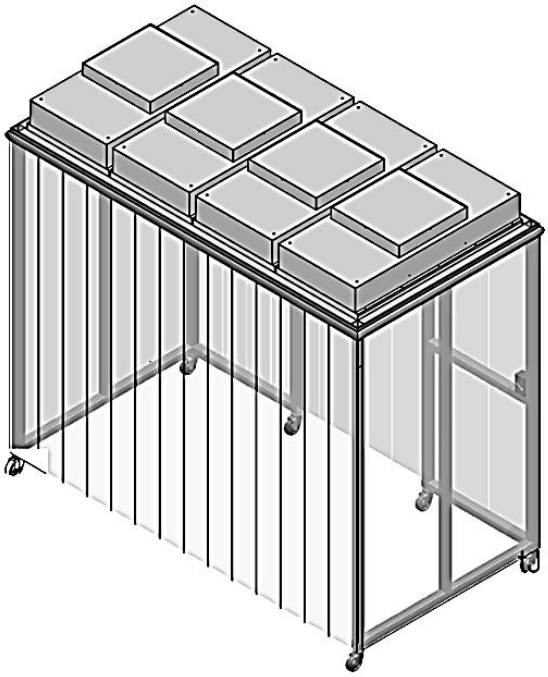
Step 3:

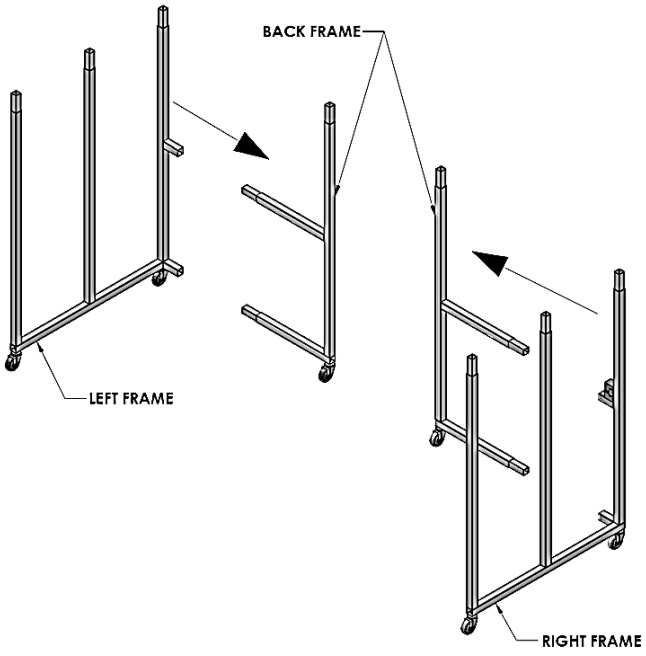
a. 1870-03B / 1870-03B-220 – Slide the right frame into the left frame.



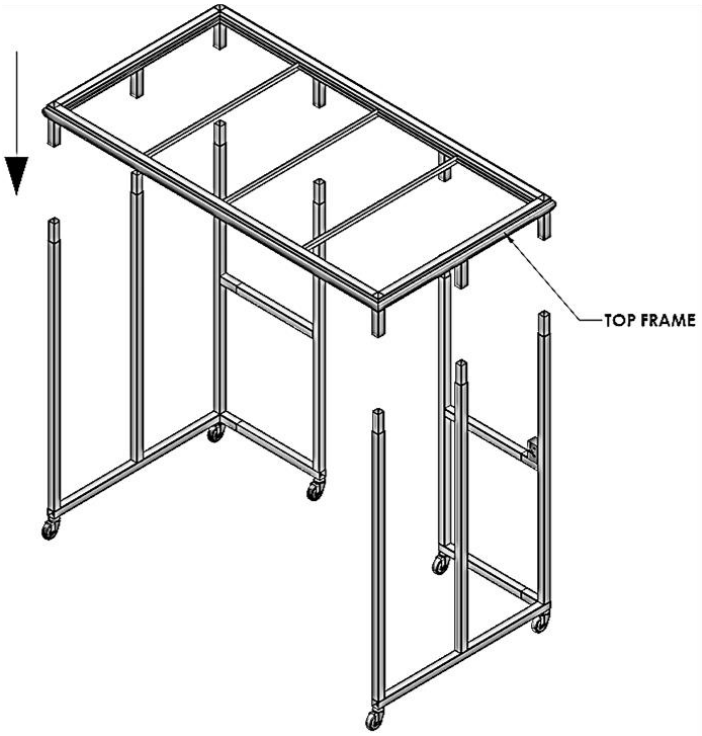


b. 1870-04B / 1870-04B-220 – Attach the left and right frame to the back frame.

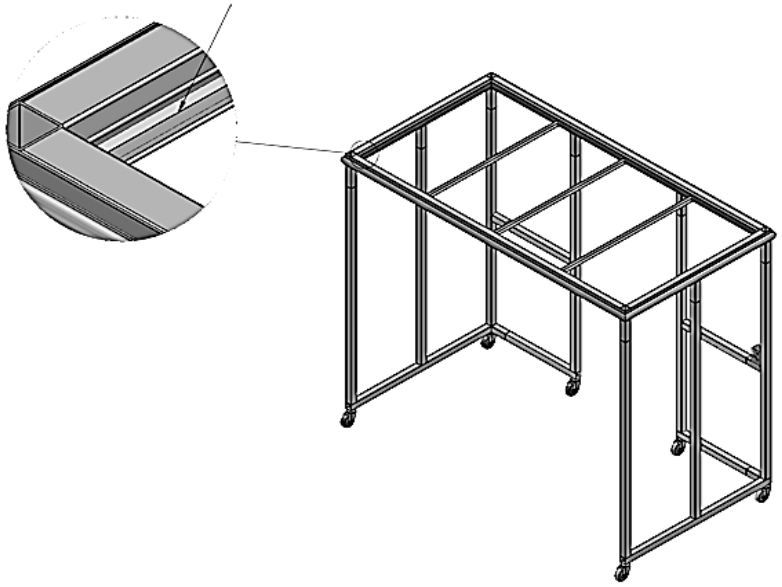




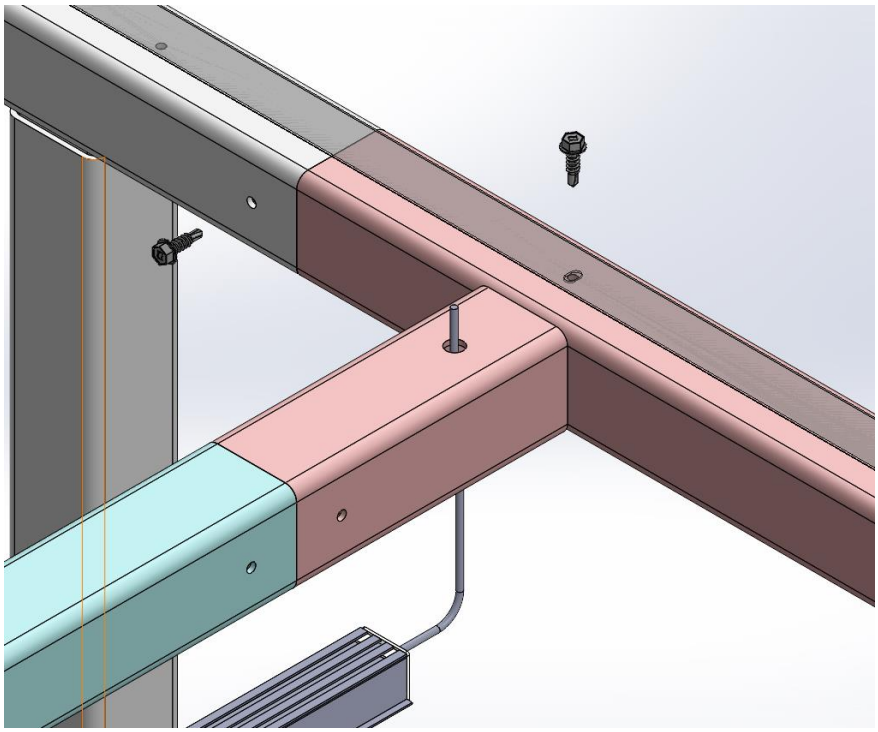
a. Attach the top frame to the base assembly.



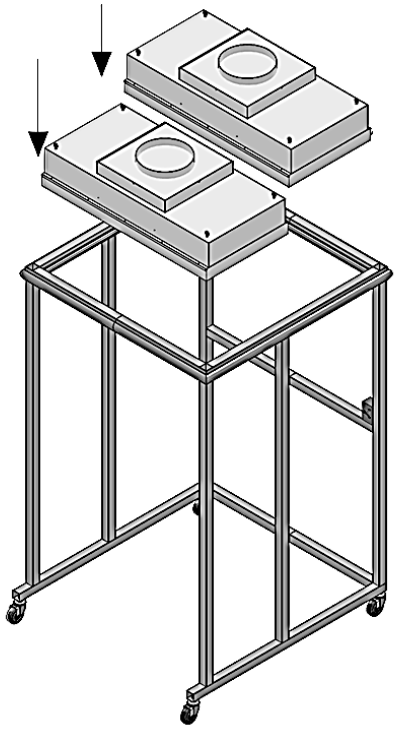
Step 4 (Optional): Apply gasketing along the ceiling grid perimeter.

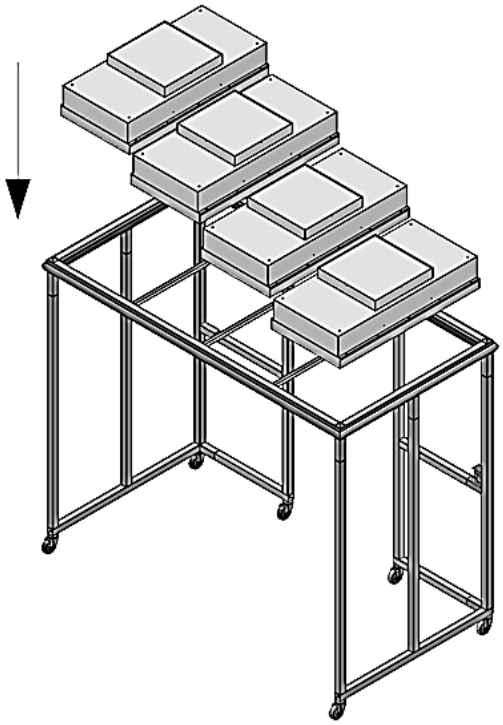


Step 5: Once the frame structure is assembled, the LED light panel wiring must be installed through the openings provided and secured with sheet metal screws.

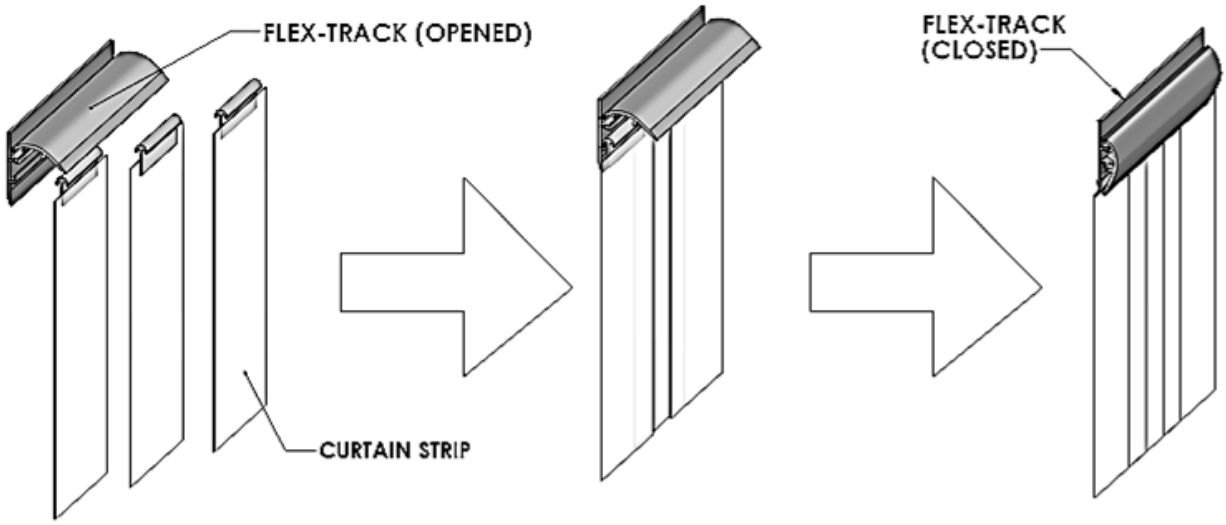


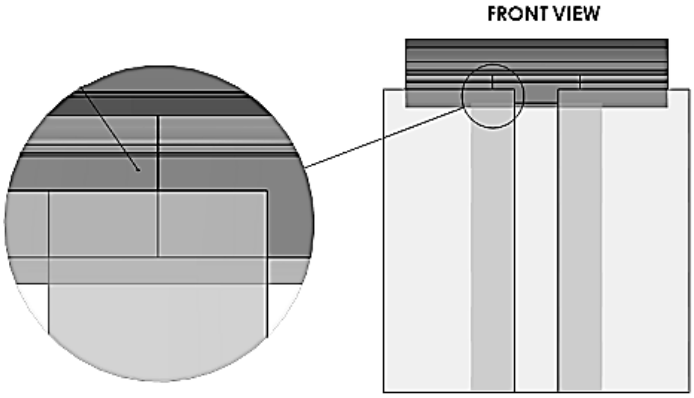
Step 6: Place the fan filter units onto the ceiling grid.





Step 7: Raise the outer cover of the Grip-Track™ mount. Seat the curtain bead inside the track, and snap the cover down to secure the curtain.





3.1 System Operation

1. Plug the power cord into an appropriate grounded receptacle (115VAC, 50/60Hz or 230VAC, 50/60Hz).
2. FFUs and light are controlled by means of a single ON/OFF switch, located on the right-rear portion of the work area.
3. The FFUs incorporate a 3-position impeller blower, which is normally shipped in the "High" position. Under normal operating conditions, this setting should not be changed. The blower speed control is located on the upper-right side of each unit.

3.2 Specifications

Terra Part #	Voltage	Airflow Direction	Inside Width	Inside Depth	Inside Height
1870-01A	120 V	Vertical	48.25”	26.3”	70.1”
1870-02A	120 V	Vertical	72.5”	26.3"	70.1”
1870-03B	120 V	Vertical	49.25”	49.25"	84.1"
1870-03B-220	220 V	Vertical	49.25"	49.25"	84.1"
1870-04B	120 V	Vertical	96.25”	48.25"	84.2”
1870-04B-220	220 V	Vertical	96.25”	48.25"	84.2"
1870-05A	120 V	Vertical	72.5”	26.3"	70.1"
1870-05A-220	220 V	Vertical	72.5”	26.3"	70.1"
1870-06B	120 V	Vertical	49.25”	50.25"	80"
1870-06B-220	220 V	Vertical	49.25"	50.25"	80"
1870-07B	120 V	Vertical	96.25”	48.25"	84.2"
1870-07B-220	220 V	Vertical	96.25”	48.25”	84.2”
1870-08B	120 V	Vertical	96.25”	48.25”	84.2”
1870-08B-220	220 V	Vertical	96.25”	48.25”	84.2”
1870-09B	120 V	Vertical	96.25”	48.25”	84.2”
1870-09B-220	220 V	Vertical	96.25”	48.25”	84.2”
1870-20	120 V	Horizontal	48.25”	29.5”	71”
1870-21	120 V	Horizontal	100.5”	29.5”	71”
1870-22	120 V	Horizontal	48.25”	29.5”	71”
1870-22-220	220 V	Horizontal	48.25”	29.5”	71”
1870-23	120 V	Horizontal	72.5”	29.5”	71”
1870-23-220	220 V	Horizontal	72.5”	29.5”	71”
1870-25	120 V	Horizontal	102”	29.5”	71”
1870-25-220	220 V	Horizontal	102”	29.5”	71"

3.2.1 Strip Curtain

- Static-dissipative vinyl helps prevent surface charges and particle attraction.
  - Tests performed per ASTM D257 show surface resistivity of 1.8 x 107 ohms/sq.
- Heavy-gauge materials hang straight, without the need for sewn hems or sash weights.
- Static-Dissipative PVC includes built-in static inhibitors.
- Terra offers panels made from static-dissipative polyurethane that provides permanent, humidity-independent ESD protection from sensitive manufacturing conditions.
  - This material contains no plasticizer, making it virtually non-gassing.

3.2.2 Fan Filter Unit

WHISPERFLOW® FFU PERFORMANCE DATA					
Nominal Unit Size (ft.)	Filter	Sound (dB) @90FPM	AIR FLOW (CFM)		
			HIGH	MED	LOW
2' x 4'	HEPA	49	800	720	590
2' x 4'	ULPA	49	660	640	580

WHISPERFLOW® FFU ELECTRICAL DATA								
Nominal Unit Size (ft.)	Filter	Motor HP	Voltage	Full Load Amps	Frequency (Hz)	Power Consumption (Watts)		
						HIGH	MED	LOW
2' x 4'	HEPA	1/4	120	3.8	50/60	420	380	360
2' x 4'	HEPA	1/4	208-230/240	1.8/1.6	50/60	380	310	240
2' x 4'	ULPA	1/4	120	3.8	50/60	440	425	415

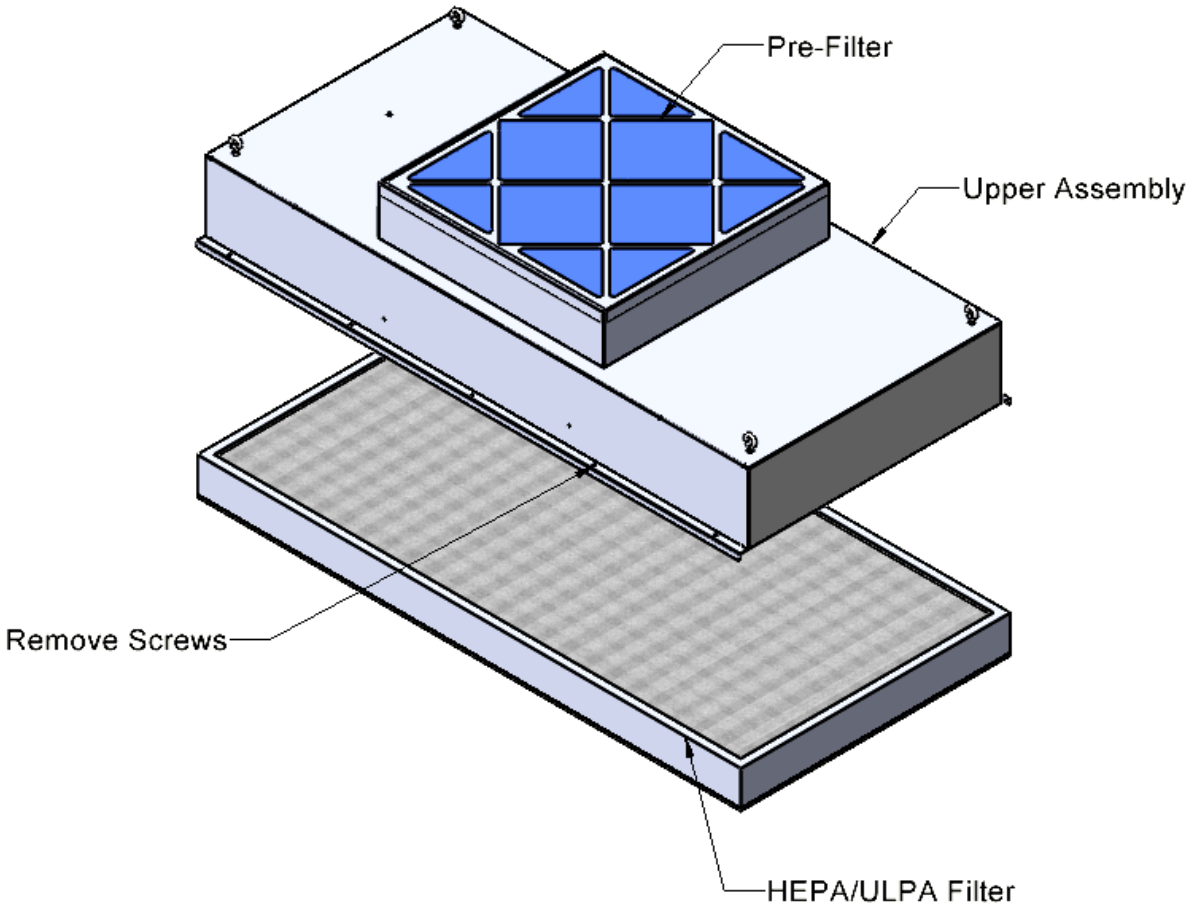
4. Maintenance

4.1 Filter Replacement

Air velocity should be monitored to ensure effective filtration using an appropriate air-speed monitor. Under typical conditions (8 hours of operation per day), filters should be replaced every year. As a HEPA filter clogs, you will notice increased blower noise and vibration, along with decreased air speed. The filter assembly is separate from the fan module, which stays in place in the ceiling grid.

Topside replaceable FFUs require the units to be removed from the hood for filter replacement.

1. Remove the unit from the ceiling grid.
2. Place the unit on a flat work surface and remove the 10 sheet metal screws that hold the HEPA/ULPA filter to the case.
3. Replace with a new HEPA/ULPA filter carefully handling edges only.
4. Secure filter to the case with the same screws used previously.
5. Place unit back onto the ceiling grid.



4.2 CleanBooth™ Frame Cleaning and Care

A thorough cleaning of coated components is required to conserve the façade decorative appearance and to reduce the corrosion strain. Powder coated surfaces proper maintenance and regular servicing are prerequisites for claims related to any guarantee and require regular cleaning at least once per year. When a coated component is soiled during transportation, storage or assembly, cleaning the component must take place immediately with clear cold or lukewarm water.

- Buildings must be cleaned more often when they are located in severe polluted environments such as; a region with increased salt contamination and/or chemical exhausts, a direct area of influence or within the vicinity of an industrial or chemical enterprise, the immediate vicinity of a sea coast or within a defined chemical/radioactive precipitation zone.
- A neutral or weak alkaline detergent can be used against severe soiling.
- Use only clean water with slight additives of neutral washing agents (pH 5-8) with the aid of non-abrasive soft cloths, rags or industrial cotton. Avoid strong rubbing.
- Use white spirit free of aromatic compounds or isopropyl alcohol (IPA) to remove greasy, oily or sooty substances. Can also be applied for adhesives, silicone cartouche, adhesive tapes or other residues.
- Use unidirectional (not circular) motion to remove surface contaminants from the edges of all surfaces.
- Do not use solvents or similar diluents containing ester, ketones, alcohol, aromatics, ethylene glycol or halogenated hydrocarbon.
- Do not use scratching or abrasive agents.
- Do not use strong acids, alkaline detergents or introfiers.
- Do not use detergents of unknown composition.
- Do not use stream-jet devices.
- Maximum exposure period of detergents must not exceed one hour. When necessary, the entire cleaning process can be repeated at least after 24 hours.
- Rinse with clean cold water immediately after every cleaning process.
- Detergents must not be used at temperatures higher than 77 °F (25 °C).
- Façade components surface temperature must not exceed 77 °F (25 °C).
- Joint sealants and other aids such as glazing aids, lubricant agents, drilling and cutting lubricants which come into contact with coated surfaces, must be pH-neutral and free of paint-damaging substance. They must be first subjected to a suitability test.

4.3 Vinyl Panel Maintenance and Care

- For critical cleanliness applications cleaning should be done at the beginning and end of each work shift.
- Follow your specific cleaning protocols as they vary greatly across industries and applications.
- Static-dissipative characteristics may degrade over time and require curtain replacement after two years (depending on temperature, humidity, UV exposure and other environment conditions).
- Static dissipative testing is recommended in static-sensitive applications.
- Anti-static vinyls have additive materials that continuously provide a naturally occurring hydro-scopic surface which is essential for the continuation of the anti-static process. Over time and with exposure the surface will develop a viscous feel. To remove the viscous coating clean periodically.
    - ➢ To clean standard PVC and Anti-Static Strips / Soft Wall curtains use mild dish soap and water solution with any biodegradable cleaner.
        - Wash the front and back of the strips and or curtains and rinse with clear water then wipe dry with a clean, lint-free soft cloth.
    - ➢ To clean anti-static vinyl use 50/50 solution of isopropyl alcohol and Di water.
        - Wash the front and back of the strips or curtains using a soft non-abrasive lint-free cloth.

***Note*: Excessive cleaning using harsh or abrasive cleaning compounds such as ammonia, 100% isopropyl alcohol, liquids with chlorinates, anti-fungals, highly active sterile cleaning solutions and dry powder additives are not recommended and will increase the aging process.**

5. Replacement Orders

Provide sales associate with pertinent information, such as serial number, model number and date, for replacement parts or a new knock-down CleanBooth™ Laminar Flow Station. The label for the CleanBooth™ is on the exterior left side of the frame and the label for the Fan Filter Unit is on the lower part of the FFU assembly.

Order Number _____ _____

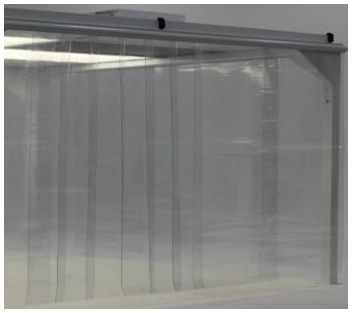
Serial Number _____

Unit Model Number_____

Date _____

6. Replacement Parts

Casters	1700-44



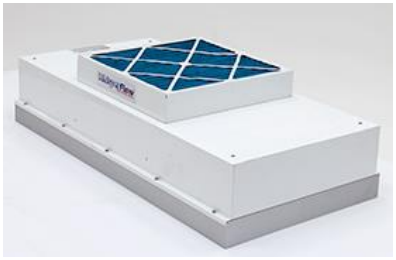
Grip-Track™	1322-60A

Curtain Panel Kits – Includes Grip-Track™, wall panels and strip curtains				
Part #	**Material**	**Width**	**Depth**	**Height**
1330-09	Anti-Static PVC	48”	48”	73”
1330-01A	Anti-Static PVC	48”	24”	70”
1330-06A	Anti-Static PVC	72”	24”	64”
1330-11	Anti-Static PVC	96”	49”	73”
1330-10	Clear Polyurethane	48”	48”	73”
1330-07	Clear Polyurethane	72”	24”	64”
1330-12	Clear Polyurethane	96”	49”	73”
1330-14	Clear Polyurethane	48”	24”	70”
1330-00A	Vinyl	48”	24”	70”
1330-05A	Vinyl	72”	24”	64”
1330-08	Vinyl	48”	48”	73”
1330-13	Vinyl	96”	49”	73”

Prefilters	6601-34

Strip Curtains		
Part #	**Material**	**Size**
1330-15	Anti-Static PVC	53" Width
1330-16	Anti-Static PVC	77" Width
1330-17	Anti-Static PVC	100" Width

Filters			
Part #	**Size**	**Type**	**Material**
6601-25	2' x 4'	HEPA	Aluminum
6601-28	2' x 4'	ULPA	Aluminum
6601-28-S	2' x 4'	ULPA	304 Stainless Steel



Fan Filter Units	
6601-24-H	WhisperFlow 120 V
6601-24-H-220	WhisperFlow 220 V

7. 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.

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!