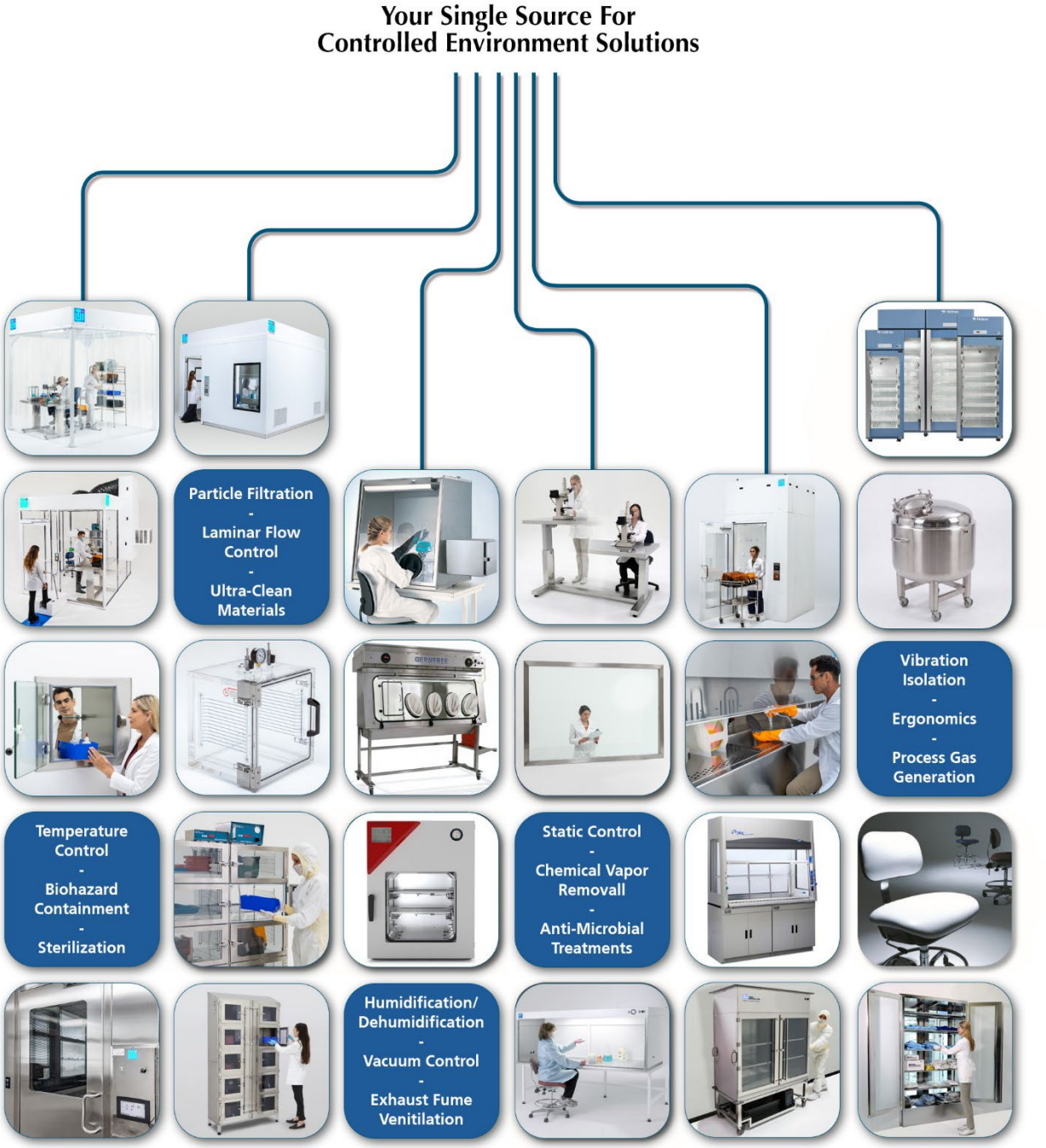


TERRA UNIVERSAL.COM
Critical Environment Solutions

Installation and Operating Guide *Document No. 1801-03*

Cleanroom Pass-Through Chambers

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Cleanroom Pass-Through Chambers

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1. Safety

Proprietary Notice	**Safety Notice**
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The information presented here is subject to change without notice.	

The installer is responsible for ensuring all of the following:

CAUTION

- **All sides of the wall cut-out must be flat and level within a tolerance of 1/16" for every 36".**
- **If the pass-through will be floor-mounted, the floor underneath and surrounding the pass-through must also be flat and level within a tolerance of 1/16" for every 36".**
- **If the pass-through includes optional components that have been preinstalled, such as an exhaust flange or ULPA filter housing, these must be removed prior to installation (See *Section 4 Exhaust Flange or Filter Housing*).**

Failure to comply with any of the instructions contained in this manual can result in damage to the unit or improper installation, rendering the pass-through inoperable.

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2. General information

Terra Universal Pass-Through Chambers allow room-to-room transfer of materials and samples without contamination. The modular-panel mounting system allows installation on any wall type (such as wood or masonry) and thickness, and keeps particle counts low by eliminating unnecessary room entry by personnel.

All cleanroom pass-throughs include a mechanical interlock system that minimizes the risk of cross-contamination. This device allows only one open door at a time, thus minimizing the amount of "dirty" air that can enter the cleanroom. General-use pass-throughs utilize a chamber-mounted interlock (also called a single-wall design). An isolated interlock (or double-wall design) simplifies cleaning and eliminates cracks that can harbor contaminants, making it ideal for the life sciences and clinical applications.



Figure 1: *CleanSeam™ Floor-Mount Pass-through with ramp*



Figure 2: *BioSafe® Wall Mount Pass-through*

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2.1 CleanMount® System

The CleanMount® System (featured on select pass-throughs) utilizes a clamping mechanism to allow the pass-through to be installed without any fasteners piercing the wall surface. This design enables quick installation with minimal impact on any high-grade finished surfaces and a significant reduction in debris and airborne particulates. When making the wall cut-out for this type of pass-through, installers have the option of finishing and sealing the cut-out with a cleanroom-grade surface. If the pass-through must be removed at a later date, the CleanMount® System uninstalls quickly and cleanly while the cleanroom can remain in operation.



***Figure 3**: CleanMount™ CleanSeam® Pass-through*



***Figure 4**: BioSafe™ CleanMount™ Pass-through*

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3. Installation

3.1 Wall Cut-Out

1. Below chart compares the two bracket designs to help identify the mounting bracket style on your pass-through. CleanMount® designs use lag bolts on either side of the chamber, thus requiring extra clearance in the wall cut-out

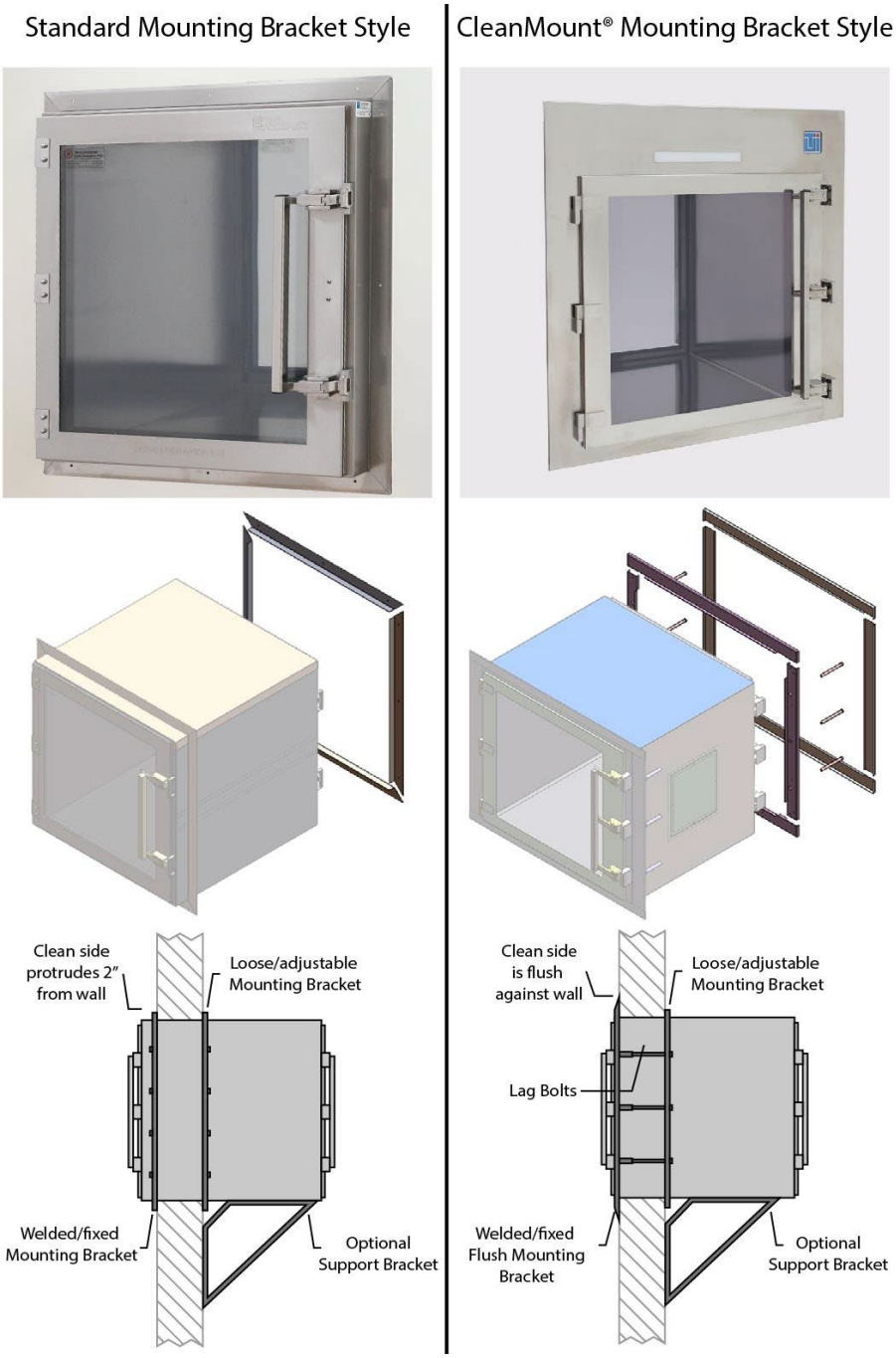


Figure 5: *(from left) Pass-through with Standard Mounting bracket and Pass-through with CleanMount® Mounting Bracket*

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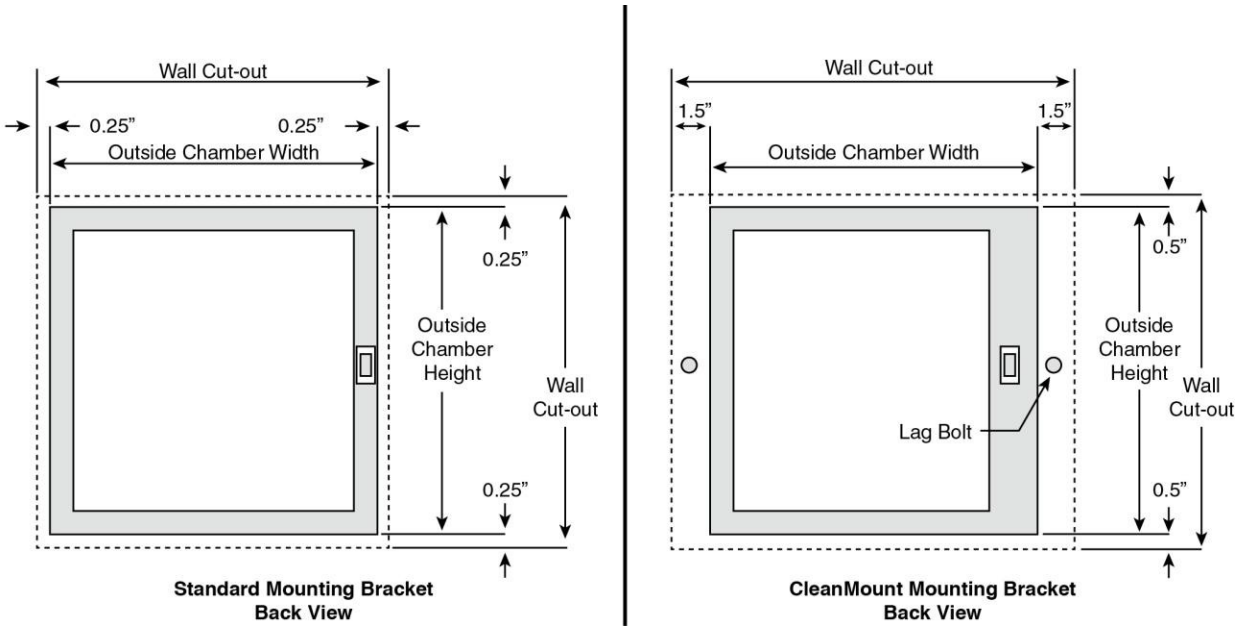


Figure 6: *(from left) Pass-through with Standard Mounting bracket and Pass-through with CleanMount® Mounting Bracket*

2. Make a wall cut-out of the size specified in the table below.

Mounting Bracket Style	Wall Cut-Out Dimensions
Standard	Add 1/2" to the width and 1/2" to the height of the outside of the chamber
CleanMount®	Add 3" to the width and 1" to the height of the outside of the chamber
Frameless Glass Door	Add 2.5" to the width and ½" to the height of the outside of the chamber

3. Add framing to the inside of the wall cut-out using a rigid support material, such as wood or metal.

4. Finish the wall cut-out with an appropriate substrate and finishing material. As a general rule, the wall cut-out should have the same grade of finishing as the wall it is installed in (e.g. cleanroom-grade materials).

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3.2 Standard Mounting Brackets

1. Terra Universal does not supply fastener hardware for the mounting brackets. Choose fasteners that are appropriate for mounting to your wall material (drywall or masonry, for example).

2. Prepare the wall cut-out as outlined in **Section 3.1**.

3. Loosen the pass-through from the shipping pallet by removing the small brackets attached on either side. See **Section 4** if your pass-through chamber includes an exhaust flange or filter housing for ventilation.

4. Slide the loose mounting bracket off of the body of the pass-through and set it aside. The other mounting bracket assembly is welded to the pass-through either 2" from one end (standard mounting) or near the middle (center mounting), depending on the wall thickness specified in the original order.

5. **FOR PASSTHROUGHS WITH LIFT-OFF HINGES (Figure 7.2): Before installing the pass-through in the wall**, the protruding lift-off hinges must be removed from the "dirty" side in order to fit the passthrough into the wall cut-out. Locate the two (2) mounting screws on each hinge (4 screws total)

   on the "dirty" side door. Carefully remove these screws from the inside of the passthrough to detach both hinge assemblies (**Figure 7.3)**. Set aside the door, hinges and screws in a safe location and reinstall after the chamber is inserted into the wall cut-out.

6. Insert the pass-through into the wall until the fixed (welded) mounting bracket is flush against the wall. Use a level to straighten the chamber and fasten the bracket to the wall through the pre-drilled holes. The number of fasteners needed depends on the size of the chamber.

7. From the "dirty" side, slide the loose mounting bracket onto the chamber and secure it to the wall with fasteners. Do not over-tighten the fasteners as this may bend the bracket and create gaps. Use silicone caulk or expansion foam to fill gaps as needed.

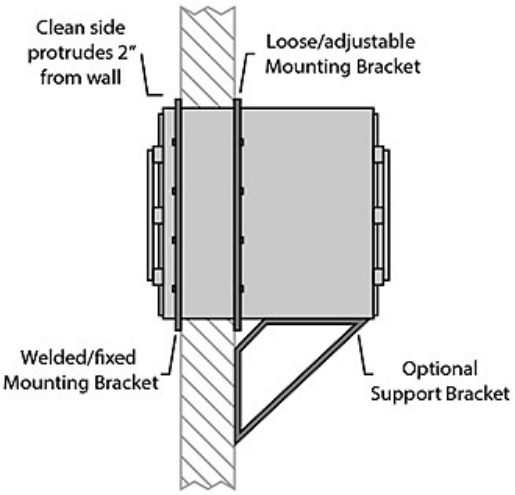


Figure 7: *Diagram of installed pass-through with standard mounting brackets*



Figure 7.1: *Pass-through with standard mounting brackets, fastened to the wall*

8. If the chamber protrudes from the wall by 24" or more, install optional support bracket(s) to the wall, below the chamber (See **Figure 7*).*** The body of the pass-through chamber rests upon the bracket and no fasteners required.

9. After all mounting hardware is secured and pass-through is properly leveled reinstall the BioSafe® hinges and "dirty" side door.

10. Check alignment of both pass-through chamber doors by following the procedures outlined in **Section 3.6 Door Alignment**.



Figure 7.2: *Outside view of BioSafe® lift-off hinge*



Figure 7.3: *Remove screws inside passthrough to remove hinges*

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3.3 CleanMount® Brackets

Installation Video: To view a video demonstrating a similar installation, please visit the following link: https://youtu.be/1tnedlfBi9w

1. Prepare the wall cut-out as outlined in **Section 3.1**.
2. See **Section 4** if your pass-through chamber includes an exhaust flange or filter housing for ventilation.
3. Standing on the "clean" side of the wall, slide the pass-through completely into the wall until the attached mounting bracket is flush with the "clean"-side wall surface (See **Figure 9**).
4. Optional support brackets are recommended if the chamber protrudes from the wall by 24" (See **Figure 9**) or more.
5. Check alignment of the pass-through chamber doors by following the procedures outlined in **Section 3.6 Door Alignment**.
6. The "dirty"-side mounting bracket is shipped preassembled. Pop off the bracket covers and slide the bracket onto the body of the pass-through (See **Figure 10)**. If necessary, detach one section of the mounting bracket by removing the two screws at each corner, creating a "C" shape. Slide the "C"-shaped bracket onto the chamber and then reattach the missing section, tightening all corner screws once the bracket is in place.
7. Confirm chamber positioning with a level, and insert the provided lag bolts into the pre-drilled holes in the mounting bracket. Thread the lag bolt into the guide that extends from the "clean"-side mounting bracket (See **Figure 11**). The size of the pass-through will determine the number of bolts required. Use a socket wrench to tighten the lag bolts into the pre-welded nuts until the mounting bracket is flush against the wall (See **Figure 12**). Be careful not to over-tighten the "dirty"-side mounting bracket lag bolts. The bracket should be secured against the wall but should not bend inward (forming gaps).
8. Install the bracket covers by snapping each of them into the bracket clips (See **Figure 12**).

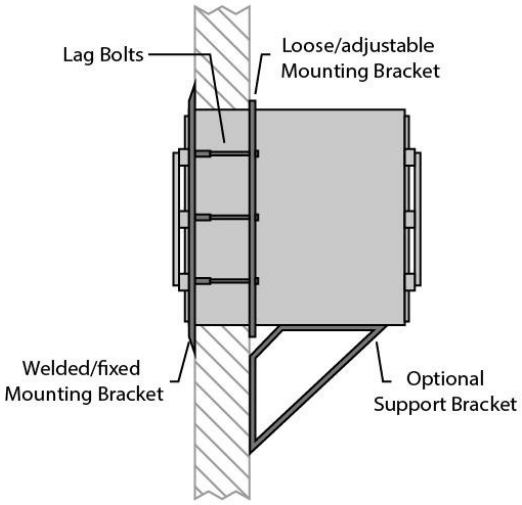


Figure 9: *Diagram of installed CleanMount® Pass-through*



Figure 10: *Slide the "dirty"-side mounting bracket onto the body of the pass-through*

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NOTE

Terra Universal provides lag bolts that accommodate wall thicknesses between 4” and 6”. Longer lag-bolts are required for thicker walls (not provided by Terra).

NOTE

Although the mounting brackets are designed to provide a sufficient seal against the wall surface, silicone caulking may be used to fill any seams or gaps after the installation is complete.

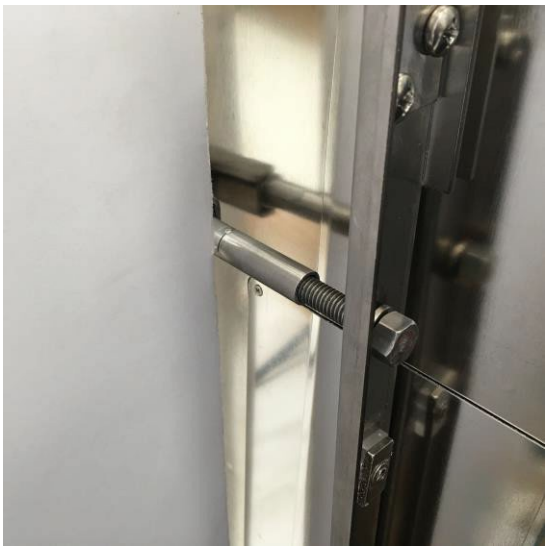


Figure 11: *Thread the lag bolt into the guide attached to the “clean”-side bracket, sandwiching the wall between the brackets*



Figure 12: *Snap the bracket covers back into place to hide the lag bolts and other hardware*

CAUTION

Be careful not to over-tighten the “dirty”-side mounting bracket lag bolts. The bracket should be secured against the wall but should not bend inward (forming gaps).

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3.4 Floor-Mounted Pass-throughs

CAUTION **The floor underneath and surrounding the pass-through must be flat and level within a tolerance of 1/16" for every 36".**
An uneven floor surface may cause gaps to appear between the pass-through components and the floor.

1. Prepare the wall cut-out outlined in **Section 3.1**
2. For pass-throughs with standard mounting brackets, complete the installation instructions outlined in **Section 3.2**. For pass-throughs with CleanMount® brackets (flush-mount), complete the installation instructions outlined in **Section 3.3**.
3. Align the floor ramps with the bottom of the pass-through so that the two notches on the rear of the ramp hook onto the studs below the pass-through doors. Push the ramp in until it is flush with the surface of the pass-through and then set it down. The pass-through door may need to be opened to ensure the ramp is fitted properly. No fasteners are required.

NOTE **Although the pass-through is designed to operate under positive pressure and assumes some leakage, silicone caulking may be used to fill any seams or gaps after the installation is complete.**



Figure 13: *Hook the ramps on the studs at the bottom of the pass-through*

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3.5 Door Alignment

Pass-through chambers being installed in a cleanroom wall must be properly aligned to ensure proper operation of the latch and the interlock mechanism.

1. Align the pass-through chamber so that the front door latches are centered in the corresponding catch (see Figure 14). To align the chamber, one corner may need to be shimmed before bolting the mounting brackets to the wall.

2. Large chambers may include support frames with leveling feet. The feet adjacent to the cleanroom wall should be adjusted to support the chamber once the "clean" side door has been properly aligned.

3. Repeat this procedure for the opposite (i.e., "dirty") door. Raise or lower the chamber corners until the door latch engages the center of the catch. Then adjust the support frame leveling feet to retain this alignment. If your installation includes support brackets, mount these to the chamber and the wall to achieve correct door alignment (See **Figure 7** in **Section 3.2** above).



Figure 14: *Properly aligned LiftLatch*

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4. Exhaust Flange or Filter Housing

If the pass-through arrived with either an exhaust flange or an ULPA filter housing preinstalled, these features will need to be detached from the pass-through prior to installation to allow the pass-through to fit through the wall cut-out.



Figure 15: *Exhaust Flange*



Figure 16: *ULPA Filter Housing*

1. To remove the exhaust flange, unscrew the 8 domed cap nuts around the base of the flange and remove the flange (See **Figure 15**).
2. To remove the ULPA filter housing, unscrew the 4 domed cap nuts on either side of the housing and remove both the ULPA filter and the housing (See **Figure 16**).
3. Reinstall these features once the pass-through installation has been completed. Installation is the reverse of disassembly.

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5. Recirculating Pass-Through

5.1 Operation

The recirculating HEPA-filtration general-use pass-through contains an added layer of protection against contamination for materials being transferred. The air return slots along bottom interior of the chamber circulate air back through the built-in fan and HEPA filter. By recirculating the interior air, airborne particles are rapidly removed by successive passes through the HEPA filter. The HEPA filter removes contaminating particles of 0.3 um or larger at 99.97% efficiency. A speed control knob allows adjustment of the blower RPM increasing the airflow and pressure within the chamber. The brushless DC fan motor is clean, quiet and energy efficient. The interior chamber provides quick access for HEPA filter maintenance and replacement.

For installation instructions including wall cut-out and mounting, refer to **Section 3.**

NOTE **A certified electrician needs to complete installation of pass-through by hard wiring the power cable to the circuit – this step provides power to pass-through for proper unit operation.**



***Figure 17**: Wall-mounted HEPA-filtered pass-through*

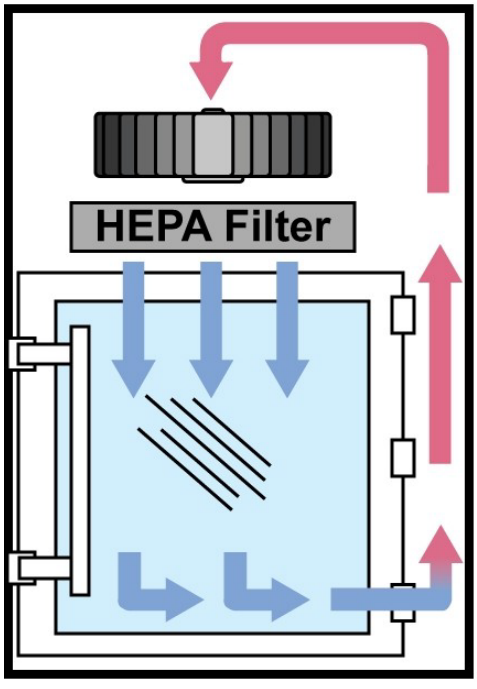


***Figure 18**: Diagram of recirculating HEPA-filtered airflow in pass-through chamber*

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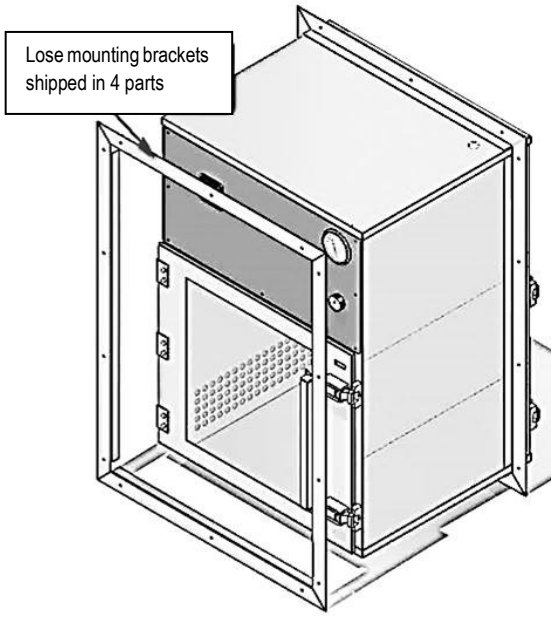


Figure 19: *Rear bracket assembly for pass-through*

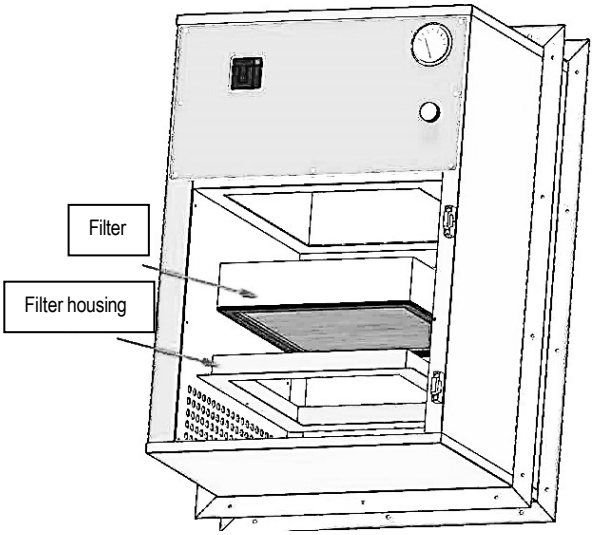


Figure 20: *Filter housing inside pass-through*

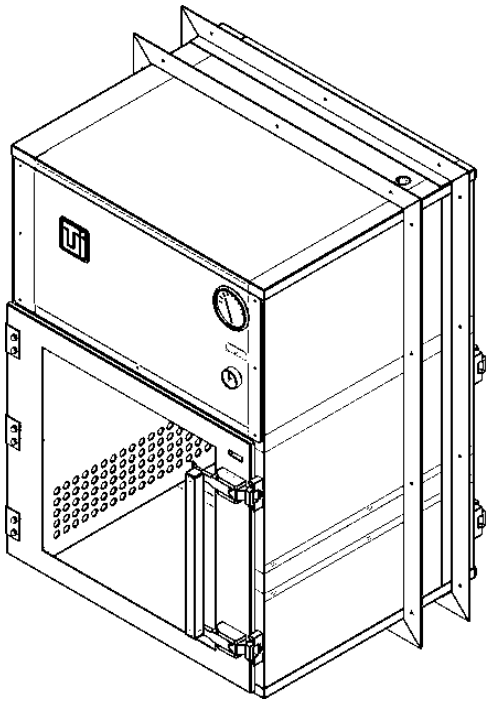


Figure 21: *Pass-through with HEPA filter installed*

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5.2 Filter Replacement

NOTE **The filter should be replaced when the minihelic reads a value of 1 W.C**

1. Remove the screws from the filter housing plate to access filter.
2. Gently let the used filter drop down, and set aside. The filter assembly is surrounded by a channel containing gel seal (See **Figure 22**).
3. Position your new filter carefully before pushing into place; the knife-edge of the fan module should be centered in the channel (equal amounts of gel on both sides).
4. Reinsert screws to mount the filter housing plate inside pass-through.
    a. Caulk edges if any leakage.



***Figure 22**: Filter inside pass-through*

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6. Operation

6.1 Interlock System


CAUTION

The operator should always verify that the opposite door is fully shut prior to opening a door. Do not yank, shake, or apply excessive force to the doors. Attempting to force open a door while the mechanical interlock is engaged may result in damage to the unit.

The FirmLok™ mechanical interlock system will prevent both doors from being opened at the same time. This system cannot be disabled, so it is important that operators fully close and latch the pass-through door after use.

6.2 Maintenance

CAUTION

- **Do not clean acrylic with alcohol or other strong cleaning agents.**
- **Do not expose static-dissipative PVC to extreme heat or direct sunlight.**

The FirmLok™ mechanical interlock system is maintenance-free and rated for over 100,000 operations. If the interlock system malfunctions, please contact Terra Universal.

6.3 Cleaning

Acrylic and Static-Dissipative PVC Windows
Acrylic and static-dissipative PVC should be periodically cleaned with clean, lukewarm water and a clean nonabrasive cloth. If desired, a mild, non-abrasive detergent may also be used. Use only light pressure when cleaning. If the outside of the acrylic is exceptionally dirty or gritty, rinse the surface first by lightly swabbing a saturated cloth over the surface and allowing 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 acrylic by blotting gently with a clean, dry cloth.

Stainless Steel
Clean stainless steel surfaces with alcohol (or similar cleaning agent) and a damp cloth.Terra recommends use of knitted polyester wipers or spun-lace, non-woven blends of cellulose and polyester manufactured and packaged specifically for cleanroom use. These products are manufactured under tightly controlled conditions that restrict the use of binders or chemical treatments that can outgas, and cleanroom packaging and strict lot control ensure optimal cleanliness.

Less critical environments (ISO 6 – 8 / Class 1000 – 100,000) generally tolerate more absorbent materials made of 100% cotton twill or cellulose.

Clean surfaces with clean, lukewarm water with or without a mild, non-abrasive detergent. In critical cleanroom applications, DI water or isopropyl alcohol may be required. For thorough, repeatable results, avoid cleaning with a circular motion, which rubs dirt or grit into the surface. Using mild pressure wipe in one direction, from top to bottom or side to side, in slightly overlapping stokes. Fold the wiper between strokes, and replace with a clean wiper often. If cleaning with isopropyl alcohol or a similar cleaning agent, perform a full wipe-down of the sanitized area with deionized water.

Cavicide, Caviwipes, and similar products contain ethylene glycol and benzethonium chloride, which are caustic chemicals that corrode stainless steel if not rinsed with water. After disinfecting with ethylene glycol or benzethonium chloride products, the affected area must be fully wiped down with deionized water and dried.

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7. Warranty

Scan QR code below for Terra's Warranty

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Appendix: Installation Qualification Checklist

To confirm proper installation, fill out the checklist below for each pass-through installed. Note any suspected damage, deviations from installation procedures, or performance issues in the Comments section. Equipment is found to be acceptable only when all installation criteria have been accepted and the document signed by the relevant parties.

Installation Checklist

Verify the following:	Check if Confirmed and Accepted	Performed by / Date
All mounting brackets are secured tightly against the wall		
Support brackets (if provided) have been installed below the pass-through		
No gaps larger than 1/16" exist between the pass-through and the wall/floor surface		
Pass-through doors open smoothly and close completely, with the latch centered in the corresponding catch		
The seal/gasket on the inside of each door is intact, fully adhered to the door, and seats tightly against the face of the pass- through without visible gaps		
The interlock functions properly, preventing the door from opening when the opposite door is also open		
The interior of the pass-through is clean and clear of any debris from installation		
Floor ramps (if provided) have been positioned at the base of the pass-through		

Performed by: _____ Date: _____

Reviewed by: _____ Date: _____

Comments: