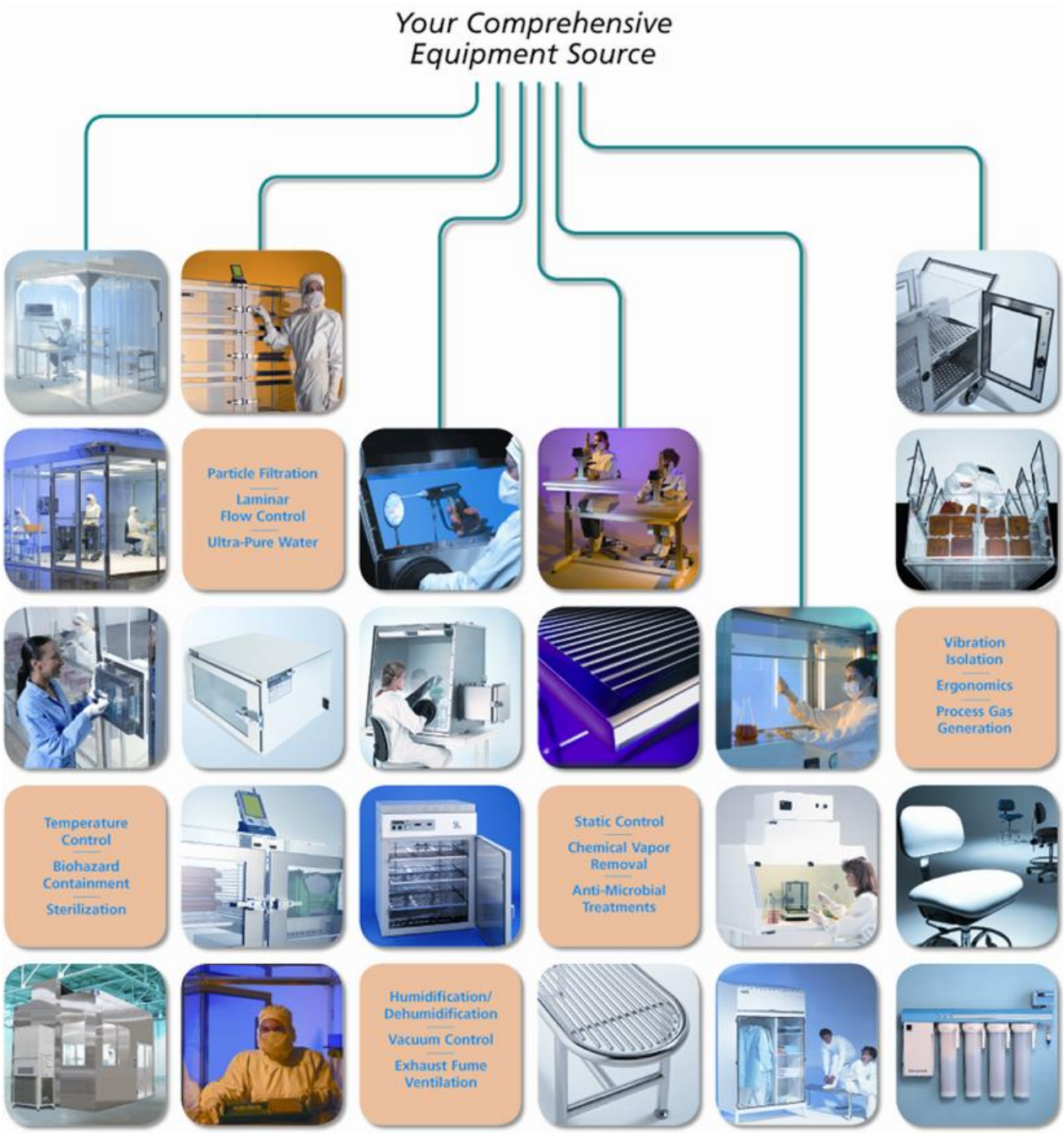
TERRA UNIVERSAL.COM
Critical Environment Solutions

Quick-Start Operating Guide *Document No. 1800-51*

Series 200 Glove Box



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Series 200 Glove Box

 • **Revised Feb. 2017** • *Document No. 1800-51*

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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 Introduction

This manual provides information on installing and operating your Terra Series 200 negative-pressure Glove Box with the remote filter/blower module, the vacuum antechamber, or the negative-pressure air lock.

By studying this document carefully, you can be assured of a long, efficient service life from your system.

Related Manuals – Available for download from www.TerraUniversal.com:

- Vacuum Antechamber (Doc. No. 1800-02)
- Vacuum Control Module (Doc. No. 1800-58)
- Glove and Sleeve Installation (Doc. No. 1800-43)

WARNING

Any glove box with provisions for negative pressure service must include a safety relief valve (Cat. No. 5235-11) to guard against damage to the chamber.

CAUTION

Care must be exercised when operative this system not to exceed the negative pressure rating of the glove box, the air lock, or the vacuum antechamber (see table below). A safety vacuum relief valve should be installed the glove box and negative pressure air lock to ensure safe operation.

Chamber	Max. Negative Pressure
Series 200 Glove Box	5" WC (Water Column)
Series 200 Negative-Pressure Air Lock	6" Hg
Vacuum Antechamber	29.9"Hg

NOTE

A stainless steel work surface is recommended on all polymer glove boxes to prevent scratching.

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2.0 Description

Terra's Glove Boxes provide a clean processing environment for a variety of critical assembly and inspection procedures. Their modular design allows for an assortment of options to suit your specific requirements. They are constructed of lightweight, transparent acrylic or polycarbonate and feature all solvent-welded seams to ensure an air-tight seal that won't leak or outgas. The 0.5" wall thickness supports negative pressures to 5" WC (water column).

Buna-N gaskets on the air lock doors provide a safe, positive seal while allowing full access to the internal chamber to insert or remove materials or equipment. The side doors open inward to allow an operator to move items in and out easily.

The standard glove box is shipped with dual chrome-plated brass needle valves with 0.125" FNPT fittings. When a vacuum pump is used to create a negative pressure inside the box, one of these valves is used for connection to the pump, and the other for bleeding the vacuum. A 0-15"WC vacuum gauge indicates pressure level, and a vacuum pressure relief valve, calibrated at 5" WC, ensures that the internal pressure never reaches an unsafe level.

Changeable Sleeve and Glove Combination

The front panel of these glove boxes features 8" flanged arm ports that allow easy connection of Terra's Changeable Sleeve and Glove Combination, which feature flexible accordion sleeves and gloves made of natural latex for easy manipulation of objects inside the chamber.

Hinged Removable Glove Port Covers

This optional feature allows you to seal the system and then remove gloves for cleaning or change-out—while maintaining the integrity of the internal glove box environment. The hinged port covers lie flat on the glove box floor when not in use.

Air Locks (Standard and Negative Pressure)

These units can be mounted on either side of the chamber to provide a safe, practical way of moving materials into and out of the work area. Materials are loaded into the air lock by means of an external door; an operator then opens an internal door inside the glove box to bring materials into the work area. The standard air lock features its own gas inlet, system pressure, and an Automatic RB Valve port in case your application requires air lock purging. The Negative Pressure Air Lock is made of 0.5"-thick acrylic or polycarbonate that supports a negative pressure to 6" Hg. They include dual needle valves, a pressure gauge, and a vacuum safety relief valve (see descriptions above under "Glove Box").

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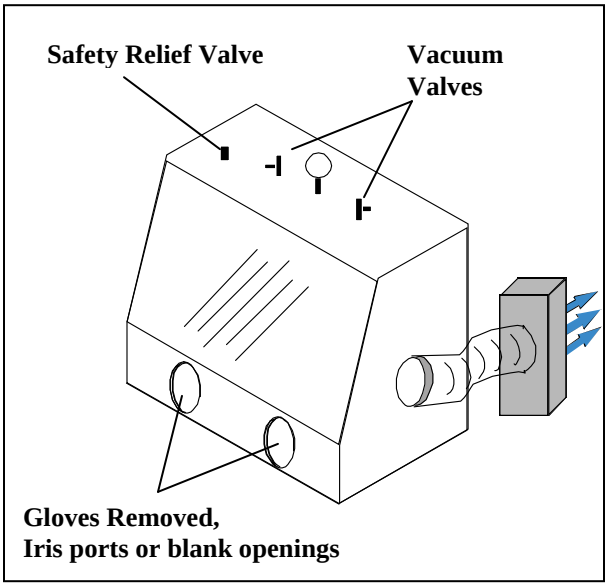
Vacuum Antechamber
Made of 0.5"-thick acrylic, this antechamber safely supports vacuums to 29.9"Hg and is thus well suited for degassing processes, vacuum encapsulation, and many other vacuum tests and experiments. It mounts on the right side of the Series 200 Glove Box for easy pass-through operations. Includes a vacuum gauge and dual shut-off valves. It is generally operated with Terra's Vacuum Control Module (No. 1681-75), which automatically controls vacuum pressure inside the chamber to ensure safe, consistent processing.

Tilt-Up Viewing Windows
The Series 200 Glove Box is also available with a Tilt-Up Viewing Window that swings open to allow easy access. Dual piston mechanisms hold the window securely open. The price for this option includes modification of any Terra plastic glove box to include hinged viewing window.



3.0 Installation

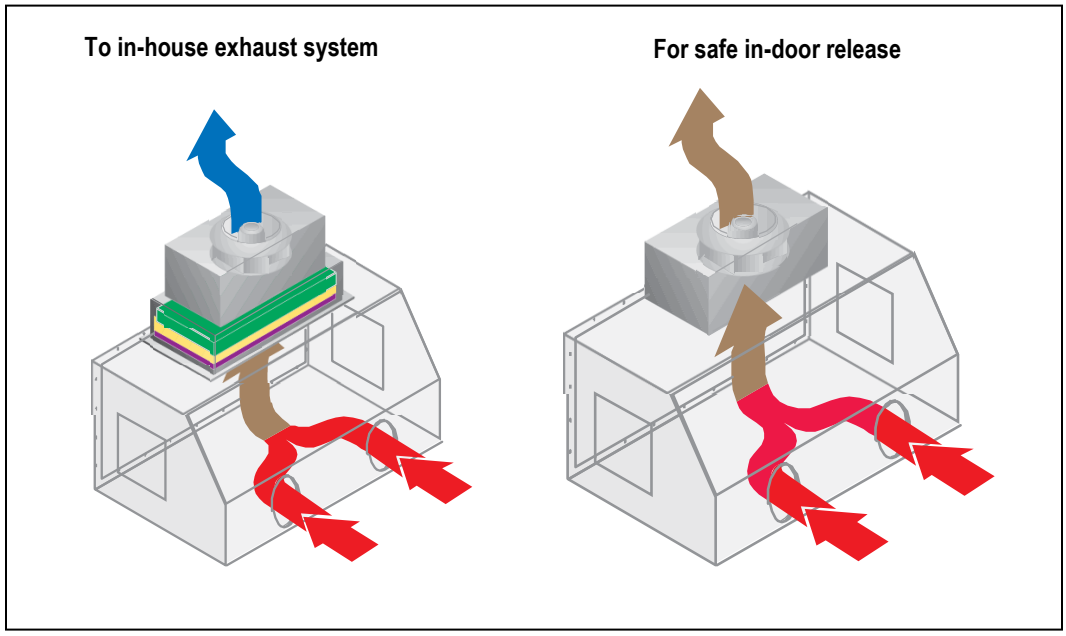
WARNING

To prevent dangerously low oxygen levels and risk of asphyxiation, nitrogen-purged systems should only be installed in a well-ventilated area.

Terra Glove Boxes are normally delivered with all specified components as a complete turnkey system. In this case, you need only make the required vacuum and power connections.

We recommend, however, that you review all of the information in this section. It provides guidelines that will prove helpful if you ever add to your system or if you need to disassemble system modules in order to perform maintenance procedures or move large equipment into the glove box.

Carefully uncrate the glove box and accessories and visually inspect for damage, both inside and out. Be sure not to throw away any important items with the packing material. Any damages should be reported according to the procedures outlined in the shipping agreement.



These set-up procedures apply to most common applications.

Uncrating and Setting up the Glove Box

Make sure that your glove box is placed on a level, stable surface, away from heat or chemicals that could damage it.

CAUTION

A stainless steel work surface is recommended on all polymer glove boxes to prevent scratching; this protection is particularly important with static-dissipative PVC.

For Use with Remote Ventilation Filter/Blower

In this application, the glove box is shipped with a conduit flange to allow easy conduit connection.

1. Close the vacuum valves located on the top of the glove box.
2. Connect exhaust conduit to the conduit flange. The standard flange is for 6"-diameter hosing.
3. Connect the other end of the conduit to Terra's remote filter/blower module. The filter/blower module should be equipped with a purification (activated charcoal) filter appropriate to the exhaust fumes in your application.

WARNING

Do not attempt to operate this system with gloves installed on the glove ports, or the negative pressure could damage gloves and glove box.

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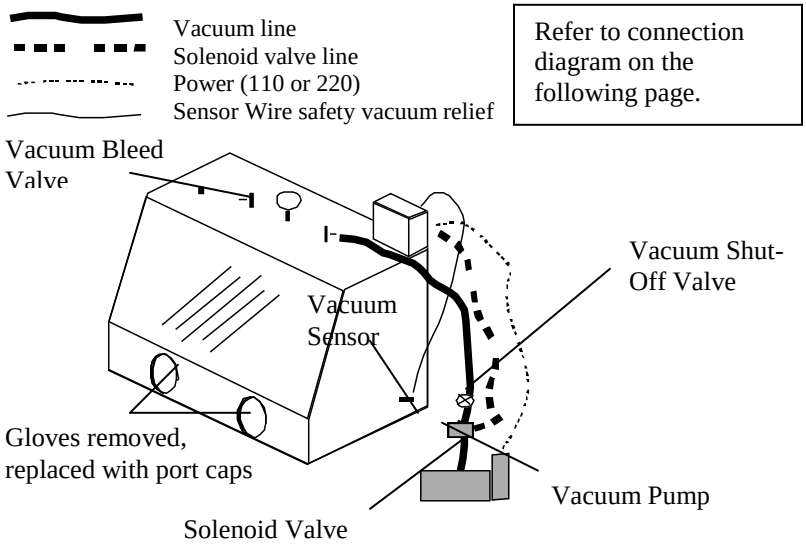
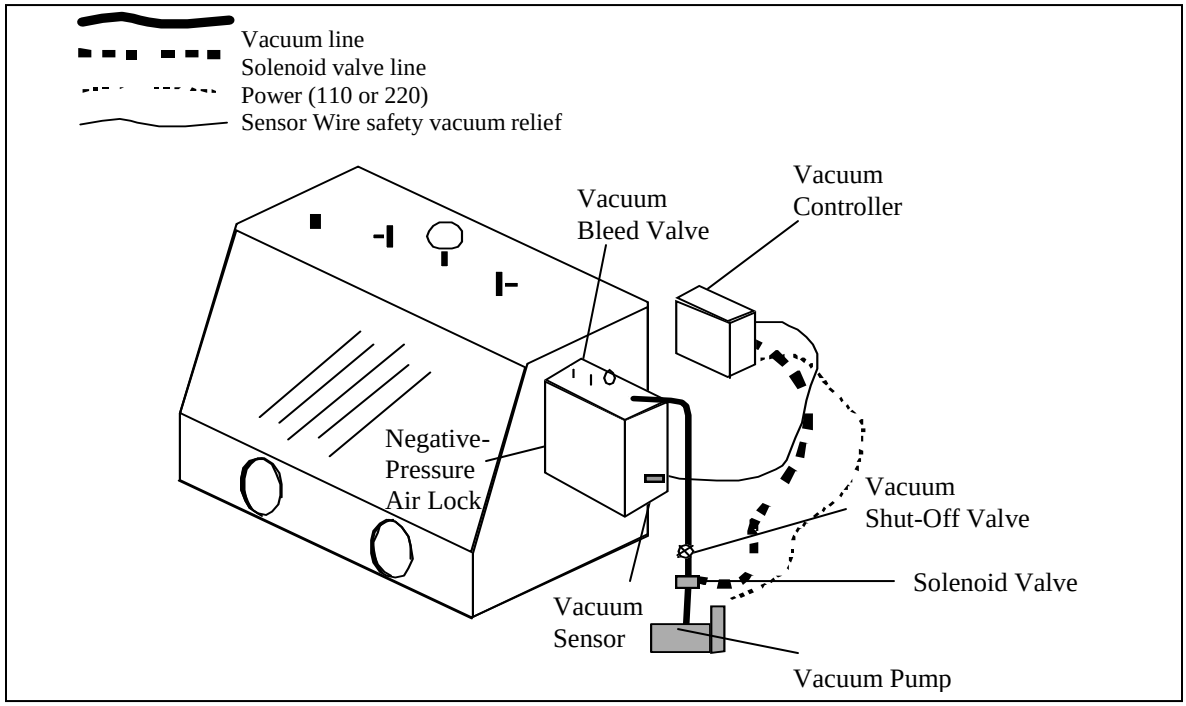
For Use as a Ventilation Chamber

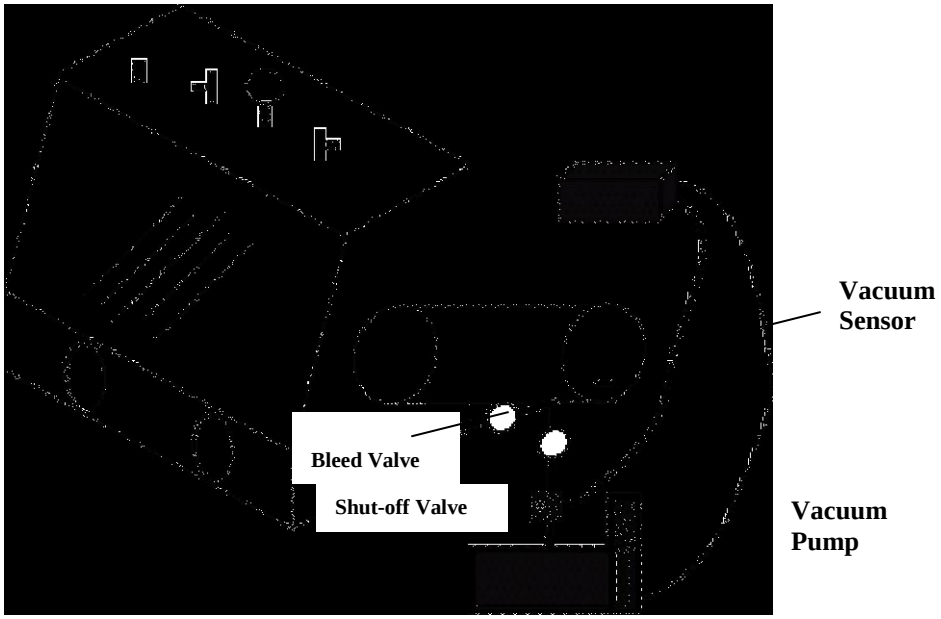
This configuration includes a filter/blower module that ventilates fumes inside the Series 200 Glove Box. The ventilation module comes installed, ready for operation. In ductless applications, it includes an activated charcoal filter to remove organic fumes. A final HEPA filter can be included to remove particulates for use in a cleanroom.



WARNING

Do not attempt to operate this system with glove installed on the glove ports, or the negative pressure could damage gloves and glove box. Iris ports are recommended for this application.





For Use with Vacuum Pump (to Glove Box or Air Lock)

In this application, a vacuum pump is used to create a negative pressure inside the glove box. Use of Vacuum Controller requires factory installation of vacuum sensor inside the glove box or air lock.

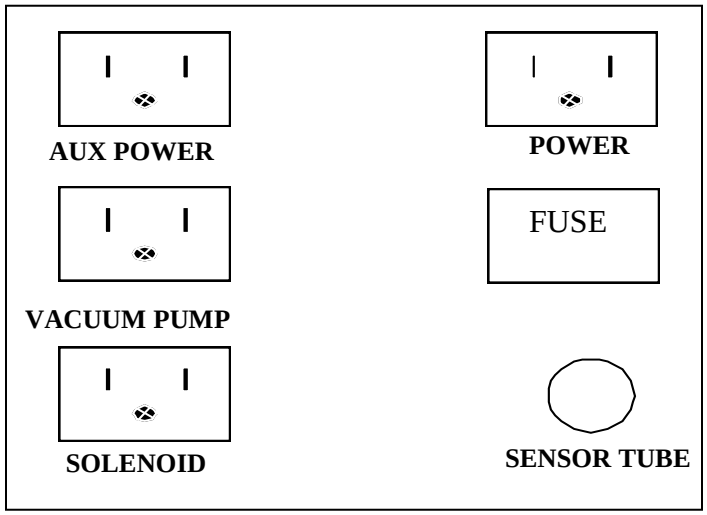
1. Connect the vacuum line to one of the vacuum fittings on top of the enclosure. Open this valve and close the other (which is used only to bleed the vacuum). Open the vacuum shut-off valve located near the solenoid.

2. Make the connections as shown in the illustration.

3. Set the vacuum set point on the Vacuum Controller at no greater than 5" WC (water column)

WARNING

- **Do not attempt to operate this system with a negative pressure of greater than 5" WC, or damage to the glove box could result.**
- **Do not attempt to operate the glove box under negative pressure with gloves installed. Gloves must be removed, and the ports covered with port caps (Cat. No. 1681-65).**



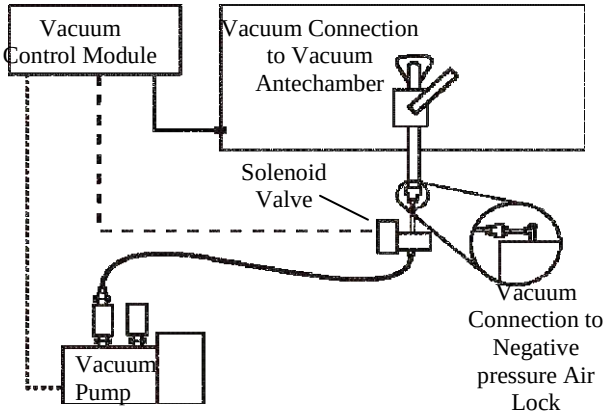
Vacuum Control Module: Rear Panel

Always close the vacuum valve on the chamber before turning off the vacuum pump, or the negative chamber pressure could draw oil into the chamber.

Use the vacuum bleed valve on top of the enclosure to release the vacuum, allowing the chamber door to be opened

For Use with Vacuum Antechamber

In this application, a vacuum antechamber allows processing at full vacuum (29.9"Hg). Use of Vacuum Controller requires factory installation of sensor inside the antechamber.



1. Connect the vacuum line to the antechamber. Open the valve leading to the solenoid (vacuum shut-off valve), and close the valve leading to the chamber (which is used to bleed the vacuum).

2. Make the connections as shown in the illustration.

3. Set the vacuum set point on the Vacuum Controller at the desired vacuum level.

WARNING

Always close the manual shut-off valve before turning off the pump, or the vacuum inside the antechamber could draw oil into the chamber.

Use the vacuum valve leading to the glove box to bleed the vacuum, allowing the antechamber door to be opened.

Vacuum Control Module Set-Up and Operation

Negative pressure applications involving the Vacuum Antechamber often incorporate Terra's Vacuum Control Module. This module automatically adjusts the vacuum line to maintain a user-selected vacuum pressure.

The back panel of the Vacuum Control Module accommodates the following connections:

AUX POWER Auxiliary power source for process equipment
VACUUM PUMP Provides power for vacuum pump
SOLENOID Provides power for solenoid valve
POWER Provides system power
(connect to 110VAC/60Hz or 220VAC/50Hz power supply)

NOTE

Power receptacles may look different for 220VAC/50Hz models.

The Vacuum Control Module automatically maintains a user-selected vacuum level by controlling a solenoid installed on the vacuum line. A vacuum sensor, factory-installed in the processing chamber, senses the vacuum pressure. When the pressure exceeds the set point, the control module closes the solenoid valve, thereby isolating the vacuum pump. When the pressure falls below the vacuum pressure set point, the control module opens the solenoid valve, allowing the pump to evacuate the chamber.

To adjust the vacuum set point on the Hasting 760 vacuum controller,

1. Turn power switch on.
2. Push the program button and down arrow momentarily
3. Sp1 will flash
4. Using the up and down arrows, adjust to desired vacuum setting.
5. Push program button once more
6. sp2 will flash. sp2 contacts are inactive; do not adjust up or down arrows for sp2.
7. Push program button once more and you will be back in run mode
8. Current vacuum will be displayed.
9. If you are above your vacuum setting on sp1 , then the controller will switch external solenoid receptacle on.
10. If you are below the vacuum setting on sp1, then the controller will not switch on the external solenoid.

CAUTION

The pump should remain in operation during vacuum processing. Avoid turning the pump on and off, or damage can result. When you have completed vacuum processing, always close the valve on the vacuum line before turning off the vacuum pump. This will prevent the negative pressure inside a chamber from drawing lubricant out of the pump (damaging the pump and contaminating the processing chamber). Refer to QuickStart Guidelines.

4.0 Maintenance

Terra Universal's WorkStation is designed for low-maintenance needs for the entirety of the unit's operational lifetime. With no user-serviceable parts, the Terra WorkStation only requires periodic cleaning to preserve its like-new condition.

Terra's Glove Boxes require minimal maintenance. All materials are easy to clean with water or mild detergent and a dry, clean wipe. You should take care, however, not to damage heat-sensitive static-dissipative PVC, or to clean with harsh agents that could damage the dissipative surface.

All materials are easy to clean with clean, lukewarm water with or without a mild, non-abrasive detergent 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. Take care not to damage heat-sensitive static-dissipative PVC, or to clean with harsh agents that could damage the dissipative surface.

5.0 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.

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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.

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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.

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