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Quick-Start Operating Guide ***Document No. 1800-20***

Vertical Laminar Flow Station



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Terra Universal, Inc. • TerraUniversal.com • 800 S. Raymond Ave. • Fullerton, CA 92831 • TEL: (714) 578-6000 • FAX: (714) 578-6020

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Quick-Start Operating Guide

Vertical Laminar Flow Station

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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 Vertical Laminar Flow Station (VLF).

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:
- Horizontal Laminar Flow Station (Doc. No. 1800-46)

2.0 Description

Terra Universal's Vertical Laminar Flow Station provides a workspace enclosure that delivers a uniform wash of HEPA-filtered air onto the work surface. In addition to removing any lingering particles that are present within the wash stream, it also protects the area beneath the enclosure from inrushing contaminants. Made of a powder-coated stainless steel frame with acrylic side panels (with the option for Static-Dissipative PVC panels), Terra's VLF systems are built to last.



Why laminar flow? What separates Terra's Vertical Laminar Flow Station from simple workshop blowers is the ability to provide an evenly-distributed column of air, with all molecules inside it moving in the same direction and at the same speed. This eliminates differing air currents inside the enclosure; currents that would otherwise create turbulence and eddies that could trap particles in a constant swirl over your work surface and product. For those seeking the cleanest-possible work environment, laminar flow is the way to go.

The backbone of Terra's VLF system is a filter/fan unit that incorporates a 2-speed, direct-drive 1/3-horsepower electric motor that forces air through a HEPA filter. In conjunction with the system's prefilters, the HEPA filter removes 99.99% of all particles 0.3 microns and larger from the air stream. Each 2' x 4' filter/fan unit provides 650 CFM of filtered air @ 90 FPM, with tests showing that this air exceeds Federal Standard 209E for a Class 100 environment.

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Description (cont'd)

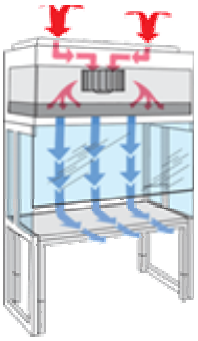
For more stringent requirements, ULPA-filtered units are available that remove all particles over 0.12 microns in size with 99.999% efficiency.

Features:

Automatic Filter Monitoring System

Terra VLFs incorporate an automatic filter monitoring system, a feature that elminates the need for frequent, tedious inspection of the HEPA filter to determine if it is operating efficiently or not. This feature monitors the status of the filter with an included differential pressure gauge, assisting the user in determining when the installed HEPA or ULPA filters needs replacing.

Static Dissipative PVC Sliding Shield



For additional control of the laminar flow, the Sliding Shield, if ordered, can be adjusted up or down along the front of the access area to the level you require. This feature allows you to control the force of the laminar flow to accommodate your application: stronger flows ensure optimal cleanliness; and weaker flows reduce turbulence that might disturb small parts.

Made of clear static-dissipative PVC, the Sliding Shield features a surface resistance value of about 10^7 ohms/square. This characteristic helps eliminate not only static charges that can damage sensitive components, but also the particles that static charges attract. As a result, users will find that the sliding shield remains clean – inside and out.

NOTE

As Terra's VLF units ship standard with acrylic side panels, Terra recommends that purchasers of the Static-Dissipative PVC Sliding Shield option upgrade their side panels to be made out of the same static-dissipative material. Contact your Terra Universal sales representative for more info.

IonBar™

An optional component for Terra's Vertical Laminar Flow Stations, Terra's IonBar™ ionizes air molecules in the air output for enhanced static/particle control. Installed on the underside of the air filters, The IonBar™ sports a teardrop design to minimize disturbance of the laminar flow.

Touch-Screen Interface

All new standard Terra VLFs incorporate an LCD touch-screen interface, allowing the user unprecedented ease-of-use in both the monitoring of system settings and in making changes to them.

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3.0 Installation

The Vertical Laminar Flow Station ships fully assembled, standard. However, it may ship in two parts at the customer's request or due to a custom order.

If the unit requires assembly upon receipt, the following procedure is to be used:

Items you will need:
- Forklift or other heavy-lift device (recommended).
- 100" of vertical clearance between assembly area and location of use.
- 110 VAC, 60 Hz or 220VAC 50/60Hz grounded power receptacle, as ordered.

1. Uncrate your Vertical Laminar Flow Station, checking to make sure that it has no visible damage incurred during shipment. If damage is found, contact the freight company to file a damage claim immediately.
2. Mount the frame onto the provided maneuvering casters.
3. Using a forklift or other heavy-lifting device, lift the housing assembly above the frame. Adjust the frame so that it lines up with the main housing's attachment points.
4. Carefully lower the main housing onto the frame, ensuring that all attachment points are properly aligned before joining the two parts.
5. Maneuver the assembly into its final operational location, ensuring that it is on a flat and level surface. Once situated in-place, remove the maneuvering casters and rest the frame upon the ground. Make sure that the unit is installed within reach of an appropriate power outlet.


NOTE

The maneuvering casters are to be used for INSTALLATION ONLY. Please remove the casters from the unit once you have moved it into its final position. Retain the casters for any future relocation needs.

6. Plug the unit in.


NOTE

Once plugged in, the unit will automatically turn on. As the unit starts, the air filtration unit will begin to operate at peak capacity, the factory -default setting.

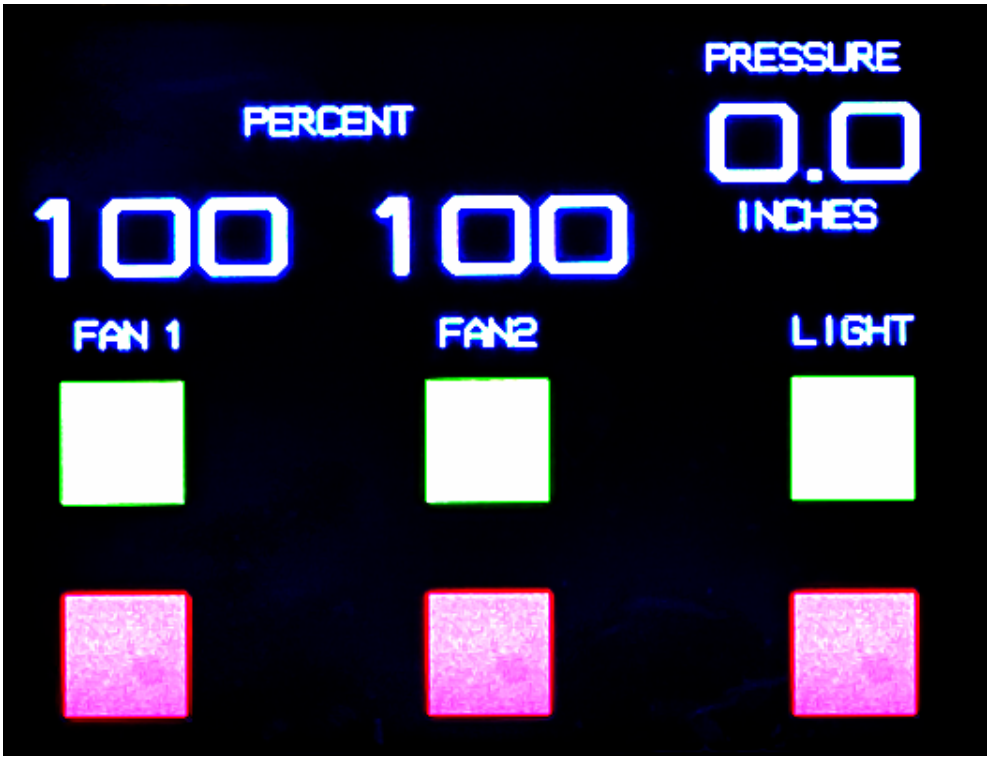
7. The unit is now ready for use.

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4.0 Operation

Once plugged in, the Vertical Laminar Flow Station turns on automatically. The Vertical Laminar Flow Station operates via an LCD touch panel. This panel displays all of the unit's functions while also allowing you to adjust them. Once plugged in, the unit remains in constant operation, with the LCD displaying the operating parameters of the unit while enabling activations/deactivation of its features.



VLF Touch-screen Interface			
Legend	Function	Description	Details
FAN 1	Blower 1 (left-side) Speed Adjustment	Increase the speed by pressing up or down on the interface panel, measured in percentage of total output.	Can be set from 0%-100%, in 5-percent increments. 0% is off, 100% is full-power. GREEN increases output; RED decreases output.
FAN 2	Blower 2 (right-side) Speed Adjustment		
LIGHT	Light Activation	Activates/Deactivates the unit's lights.	GREEN turns the light ON; RED turns the light OFF.
PRESSURE	Backpressure indicator.	Displays the differential pressure across the HEPA (or ULPA) filter. This reading is an indicator of filter efficiency and life expectancy.	Displayed in inches of water column, in increments of 0.5 in.

NOTE

For optimal laminar flow throughout the unit, both fan blowers should be set to the same setting.

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5.0 Maintenance

Terra Universal's Vertical Laminar Flow Station is designed for low-maintenance needs for the entirety of the unit's operational lifetime. With one user-serviceable parts, the Terra WorkStation only requires periodic cleaning to preserve its like-new condition.

	Cleaning Instructions
DO	- Use water, ordinary soap and/or mild liquid detergent. - Rinse the surfaces of your VLF with a cloth dampened with clean water if a cleaning agent is employed. - Use a cloth to apply any cleaning solutions. If a stubborn stain presents itself, a soft-bristled brush may be used with extreme care, with the exception of the LCD Touch-screen interface.
DO NOT	- Use liquids containing abrasives to clean the surfaces of the VLF. - Use wax or other coatings on Electro-Static Dissipative work surfaces, as they may modify the dissipative properties of the laminate. - Use hard brushes or intense scrubbing actions to clean the workstation surface. - Use Isopropyl Alcohol or other solvents on LCD touch-screen, shield (if installed) or the side panels. - Apply liquid directly to the surface of the blower hood, as errant leakage may short the Touch-screen interface. Instead, apply cleaning agent to a cloth before using.

Filter Replacement

When to Replace

Terra's HEPA filters will continue to provide adequate throughput while operating with 0.0-1.0 inches WC of differential pressure, as displayed on the LCD screen (see Section 4.0 – Operation). Once this pressure reaches 1.5 (inches WC), the air blowers will begin to deliver less-than-optimal airflow into the unit, resulting in loss of laminar flow and increasing the risk of contamination. The presence of a high differential pressure can also increase the rate of wear to the blower's motors, leading to failure of the unit. To keep your unit operating at its peak efficiency, replace the air filters whenever the differential pressure reaches 1.5 inches WC.


NOTE

Accurate differential pressure readings are obtained by operating the blowers at a setting of 100 Percent, as indicated on the LCD touch-screen (See Section 4.0 – Operation). Readings obtained at any other speed are not indicative of your filter's actual condition.

How to Replace

The HEPA/ULPA filters on the VLF Stations are attached to the blower units. To replace the filters, the blower units must be removed from the VLF Station.

CAUTION

Unplug the unit prior to conducting any maintenance service to it.

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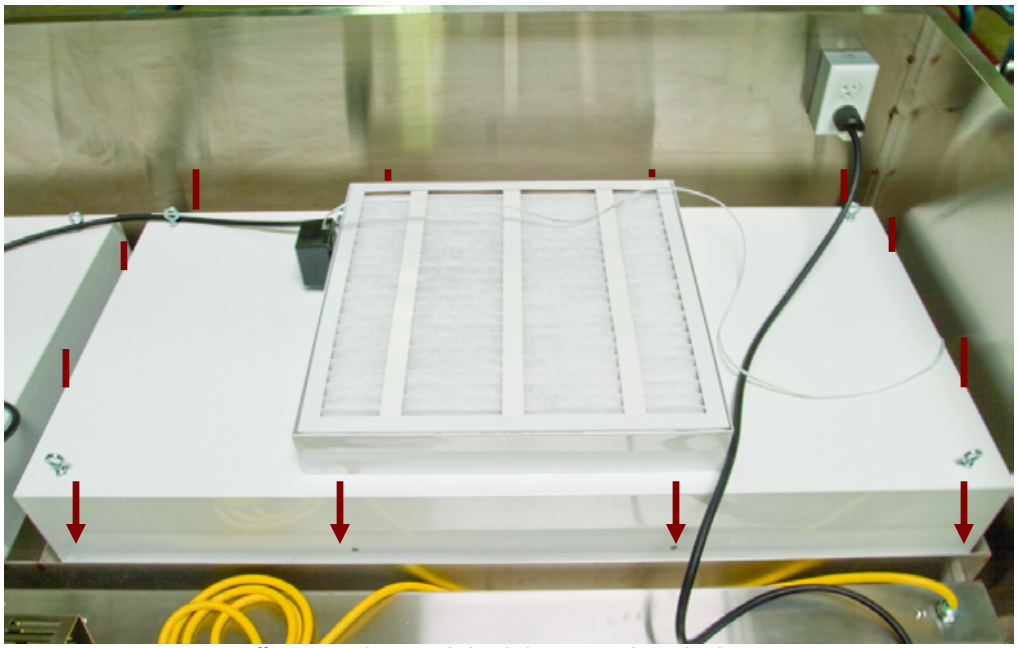
Maintenance (cont'd)

Filter Replacement (cont'd)

Items you will need:
- Forklift (recommended)
- Phillips Screwdriver.
- Work table/bench.

WARNING
- Exercise caution when removing VLF blower units.
- The use of multiple people to perform this task is advised.
- Unplug the VLF Station from its power receptacle before performing any service.
- Do not perform any maintenance service to the unit if its maneuvering casters are attached.

1. Disconnect all cables leading into the blower housing.
2. Use the eyebolts of the blower housing to attach an appropriate lifting device.
3. WITH EXTREME CARE, lift the blower housing from the VLF Station, maneuvering it onto a stable surface for further work.
4. Unscrew the top of the blower housing from the filter housing beneath it by means of the screws surrounding the unit's perimeter (see arrows in Illus. 5.1)
5. Lift the top of the blower housing from the filter housing, setting it aside.
6. Replace the used filter with the new filter.
7. Reassemble/reinstall the blower housing, working in the reverse order listed above.
8. Replace the pre-filter located on the top of the blower housing (see Illus. 5.1, below) with a similarly capable air pre-filter, available at any major hardware store.



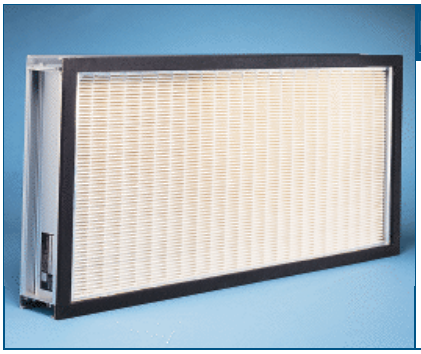
Illus. 5.1: Blower unit (1 of 2), as seen from the front.
Arrows indicate the location of screws joining the blower housing to the HEPA (or ULPA) filter.
The pre-filter can be seen atop the blower housing, in the middle of the photo.
(An optional IonBar™ is installed on this unit, its power converter to the left of the pre-filter frame.)

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Maintenance (cont'd)

Replacement Parts



HEPA Filter (ULPA also available) — 9620-(10-12)

Description: A replaceable filter capable of removing 99.99% of particles 0.3 microns and larger in diameter. (ULPA: 99.999% @ 0.12 microns.)

Applications: For filtering of particulates in Vertical Laminar Flow Stations. Three sizes to choose from, depending on VLF Station model. (Due to the variety of replacement filters and their applications, the product shown at left is for display purposes only. Your product may differ.)

Price: Contact your Terra Universal sales representative or visit www.TerraUniversal.com

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6.0 Troubleshooting

The following table describes the most common performance issues, their causes, and recommended courses of action.

	Symptom	Possible Cause(s)	Solution
General	The LCD Touch-screen does not activate.	- Insufficient power.	- Ensure that the unit is plugged in.
		- Blown fuse.	- Replace fuse. Contact Terra Universal for assistance.
		- Technical malfunction.	- Contact Terra Universal for assistance.
	The blower does not remain in motion at low speed settings.	- Insufficient fan speed setting.	- Operate the blower at a higher speed.
	Fluorescent lights do not turn on.	- The light needs replacing. - Technical malfunction.	- Contact Terra Universal for assistance.
	The sliding shield (if ordered) does not roll up/down.	- During a previous operation, the motor was left activated too long, causing the guide wires to unspool.	- Activate the motor in one direction for 10 seconds. This will cause the guide wires to re-spool and lift the sliding shield.
		- There has been a disconnect between the motor and the guide wires.	- Contact Terra Universal for assistance
		- The motor has malfunctioned.	- Contact Terra Universal for assistance.
	Insufficient Air Flow	- Insufficient fan speed setting.	- Increase fan speed setting.
		- Filter is in need of replacement.	- Replace filter. (See Section 5.0 – Maintenance)

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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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Related Products

Users of Terra Universal's Vertical Laminar Flow Stations may also be interested in:



Wet Processing Station — 2000-(16-19)

Description: Terra's Wet Processing Stations can meet a wide variety of cleaning and processing requirements. Each unit can be custom-configured for maximum versatility through the incorporation of baths, rinsers, cleaners and other processing modules. Available in Polypropylene (shown; for work with acids) or 304 Stainless Steel (for work with solvents).

Applications: Parts processing involving the use of acids or solvents.

Price: Contact your Terra Universal sales representative or visit www.TerraUniversal.com

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