UAC 2000 & 4000 User Guide

Air Filtration Systems

Version 1.0

August 18, 2016

www.ulsinc.com

Thank you for choosing Universal Laser Systems® (ULS). We appreciate innovative customers like you who have made ULS an integral part of your business.

ULS is committed to providing the highest level of customer satisfaction and support. To ensure your satisfaction, we urge you to read the documentation provided with your equipment.

Since 1988, ULS has been committed to continually improving our technology and customer-driven laser solutions. Your satisfaction is very important to us and we welcome your feedback. Tell us about your experience with ULS and about our products at: moreinfo@ulsinc.com.

Should you have any questions, please contact the ULS Factory Support Team at:

+1 480 609-0297 (USA)

+43 1 402 22 50-28 (Austria)

+81 (45) 224-2270 (Japan)

Email us at: *support@ulsinc.com*

Again, thank you for choosing ULS.

Your ULS Support Team

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About This Guide

This User Guide provides system specifications, instructions, and reference information for the UAC 2000 & 4000 Advanced Air Filtration Systems.

This guide contains the following chapters:

1	*System Specifications*	Lists the specifications of the UAC 2000 & 4000 Air Filtration Systems.
2	*Safety*	Contains important safety information about the UAC Air Filtration Systems.
3	*Getting to Know the System*	Provides a high-level overview of the system components and the Control Panel.
4	*Installation*	Provides detailed instructions on the installation of the Air Filtration Systems.
5	*Description & Operation*	Provides detailed information on the UAC Control Panel and operation of the systems.
6	*Maintaining the System*	Provides instructions for maintaining the UAC Air Filtration Systems.

System Specifications 1

The UAC 2000 & 4000 are optional air filtration units designed to capture effluent (the gaseous composition of exhaust produced by laser material processing) when used as a companion device to ULS laser systems, to address the following concerns:

- A restrictive installation environment with limited access to the outside for ventilation or in populous areas where ventilation of unfiltered laser processing effluent could cause problems.
- Locations with environmental impact regulations.

The UAC cleans the air using a four-stage filtration system. The effluent is first brought into the air cleaning unit and pulled through a Pre-filter that removes large particulates. Next, the air is pulled through a HEPA filter to remove smaller particulates. Finally, the air is pulled through two Carbon filters, removing hazardous fumes such as Volatile Organic Compounds (VOCs). The UAC also actively monitors the environment for carbon monoxide (CO).

The UAC 2000 & 4000 Advanced Air Filtration Systems have the following specifications:

	UAC 2000	UAC 4000
Air Flow Active Filtration	>150 CFM @ 9 in. H_2O > 255 m3/hr @ 2.24kPa	>300 CMF @ 9 in. H_20 >510 m3/hr @ 2.24kPa
Air Flow Standby	44.73 CFM @ 0.649 in. H_2O 75.99 m3/hr @ 0.161kPa	44.73 CFM @ 0.649 in. H_2O 75.99m3/hr @ 0.161kPa
Duct/Pipe Diameter	4 in. (101.6 mm) Diameter	6 in. (152.4 mm) Diameter
Filters	• One 24 x 12 in. (609.6 x 304.8 mm), 5-Pocket MERV 14 Pre-filters • One 17 x 17 x 3 in. (431.8 x 431.8 x 76.2 mm) HEPA filter • Two 20 lb (9.07 kg) activated Carbon filters	• Two 24 x 12 in. (609.6 x 304.8 mm), 5-Pocket MERV 14 Pre-filters • One 24 x 24 x 3 in. (609.6 x 609.6 x 76.2 mm) HEPA filter • Two 30 lb (13.60 kg) activated Carbon filters
Communications	Modular plug cable for connecting with a ULS laser system. *	Modular plug cable for connecting with a ULS laser system. *
Power	110/210-230VAC @ 8/15A max	210-230VAC @ 15A max
Dimension (H x W x D) Overall Dimension (H x W x D)	41 x 24 x 30.75 in. 1041 x 609.6 x 781.05 mm 41.5 x 24 x 39.25 in. 1054.1 x 609.6 x 996.95 mm	43 x 30.75 x 38.125 in. 1092.2 x 781.05 x 968.37 mm 43 x 30.75 x 41.125 in. 1092.2 x 781.05 x 1044.57 mm
System Weight	Approximately 350 lb (158.757 kg)	Approximately 525 lb (238.136 kg)
Available Accessories	• UAC Wheel Kit • Single 4 in. (101.6 mm) to 4 in. (101.6 mm) Exhaust Adapter Kit (For use with a VLS3.60, VLS4.60 or PLS4.75) • Single 4 in. (101.6 mm) to Dual 4 in. (101.6 mm) Exhaust Adapter Kit (For use with a VLS6.60 or PLS6.75)	• UAC Wheel Kit • Single 6 in. (152.4 mm) to Dual 4 in. (101.6 mm) Exhaust Adapter Kit (For use with a PLS6 series or ILS series system) • Single 6 in. (152.4 mm) to Single 6 in. (152.4 mm) Exhaust Adapter Kit (For use with XLS series system) • Single 6 in. (152.4 mm) to Triple 4 in. (101.6 mm) Exhaust Adapter Kit (For use with an ILS series system with the Traveling Exhaust optional laser processing support module)

* The UAC 2000 & 4000 does not require a ULS laser system to operate. The UAC was designed to automatically integrate and function with a ULS laser system but will serve equally well as a stand-alone device or with an alternate laser system.

Safety 2

Description of Appropriate Use

This air cleaner is designed for use with ULS laser material processing systems to provide exhaust air flow to remove smoke and fumes produced by laser material processing and filter the smoke and fumes out of the air in an office, laboratory, workshop or light duty manufacturing environment. Materials to be laser processed must be compatible with the air cleaner for proper operation. For a list of compatible materials please contact ULS or visit our website.

General Safety

Use of the equipment in a manner other than described in this manual or failure to follow the operational requirements and safety guidelines listed in this manual can result in injury may cause damage to the equipment and surrounding property.

	NEVER OPERATE THE LASER SYSTEM WITHOUT CONSTANT SUPERVISION OF ALL CUTTING, MARKING AND ENGRAVING PROCESSES. Exposure to the laser beam may cause ignition of combustible materials which can lead to fire. A properly maintained fire extinguisher should be kept on hand at all times.
	THIS AIR CLEANER IS DESIGNED FOR USE ONLY WITH COMPATIBLE MATERIALS. For a full list of compatible materials, please consult the factory. ALWAYS REPLACE FILTERS WITH GENUINE ULS REPLACEMENT FILTERS. Used of third party/aftermarket filters can result in inadequate filtering and allow hazardous levels of fumes and particulates to pass through the air cleaner and may void the warranty. FILTERS ARE NOT REUSABLE. Do not attempt to clean and reuse spent filters. WEAR A DUST MASK, EYE PROTECTION AND GLOVES WHEN REPLACING FILTERS. Contaminates collected by filters can be dangerous to health if inhaled or ingested. Always place filters in heavy duty bags for disposal. USED FILTERS AND PRE-FILTERS SHOULD BE DISPOSED OF IN ACCORDANCE WITH LOCAL LAWS AND REGULATIONS. ULS is not responsible or liable for any injury, damage, or contamination caused by inappropriate or unlawful disposal. CONSULT LOCAL REGULATIONS CONCERNING FUME EXTRACTION SYSTEMS. They may be subject to requirements including; periodic inspection and compliance certifications. THIS DEVICE DOES NOT FILTER CARBON MONOXIDE (CO). Carbon monoxide inhalation can cause serious injury or death. Adequate ventilation is necessary to avoid a dangerous buildup of carbon monoxide. If uncertain consult local industrial ventilation specialists.

DO NOT ATTEMPT TO MOVE OR LIFT THIS UNIT ALONE. Obtain the assistance of additional people when lifting or carrying (secure access doors before lifting). Injury may occur if improper lifting techniques are used or the system is dropped.

DANGEROUS VOLTAGES ARE PRESENT WITHIN THE ELECTRONICS ENCLOSURES OF THIS UNIT.
Access to these areas (marked with warning labels) is not necessary during normal operation. If it becomes necessary to open one of these enclosures for any reason, the power cord must first be disconnected from the electrical supply.

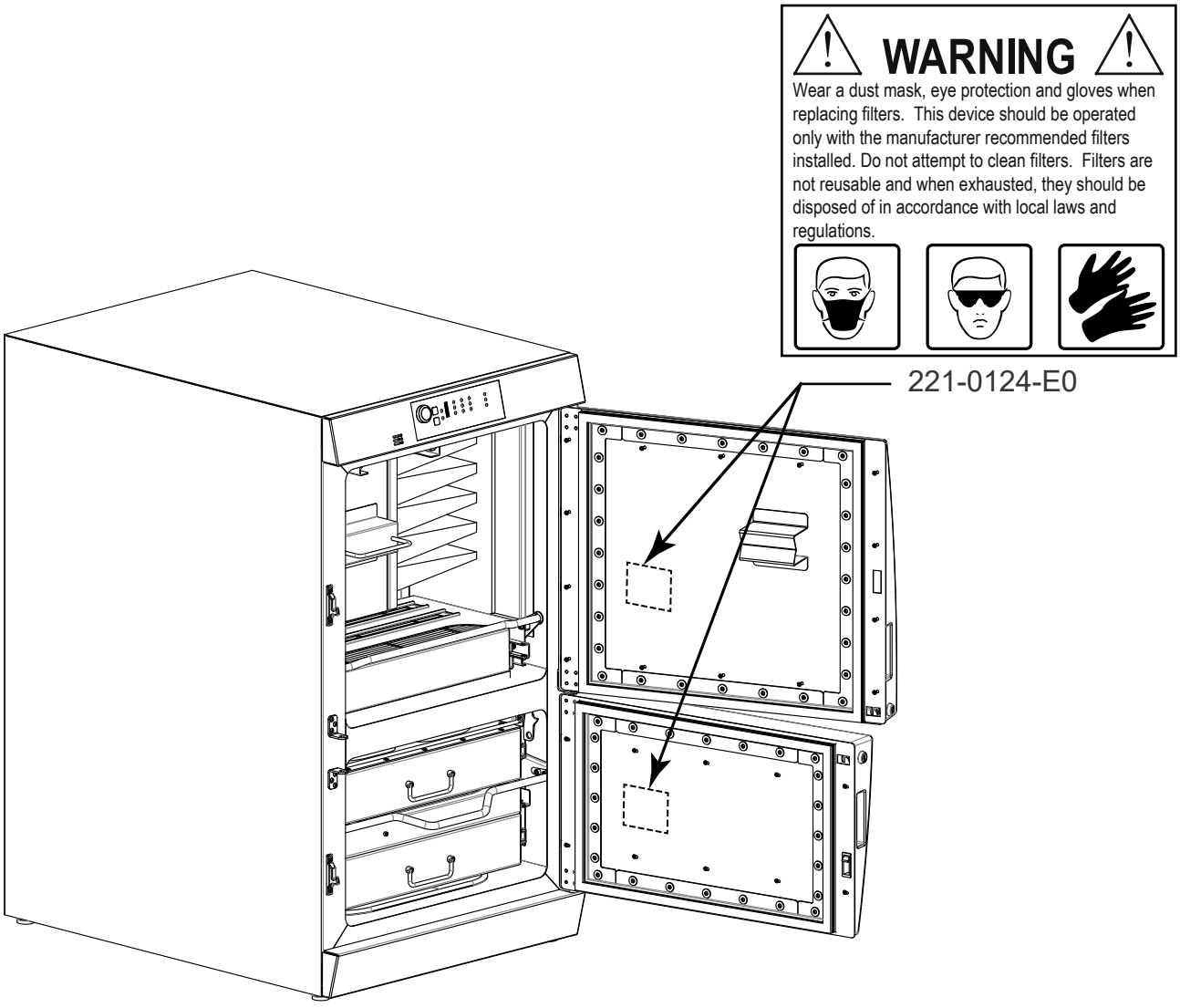
NEVER REMOVE THE GROUND LEAD TO THE ELECTRICAL CORD AND PLUG THE SYSTEM INTO A NON-GROUNDED OUTLET. An air cleaner that is not properly grounded is hazardous and can result in severe or fatal electrical shock. Without proper grounding, the unit may exhibit sporadic or unpredictable behavior. Always plug the system into a properly-grounded (earthed) outlet.

THE POWER SUPPLY CORD IS THE MAINS DISCONNECT DEVICE; THE EQUIPMENT SHOULD BE LOCATED CLOSE TO AN EASILY-ACCESSIBLE POWER OUTLET. To disconnect the equipment from the supply mains, the power cord should be unplugged from the power outlet or main power inlet (appliance coupler) of the unit.

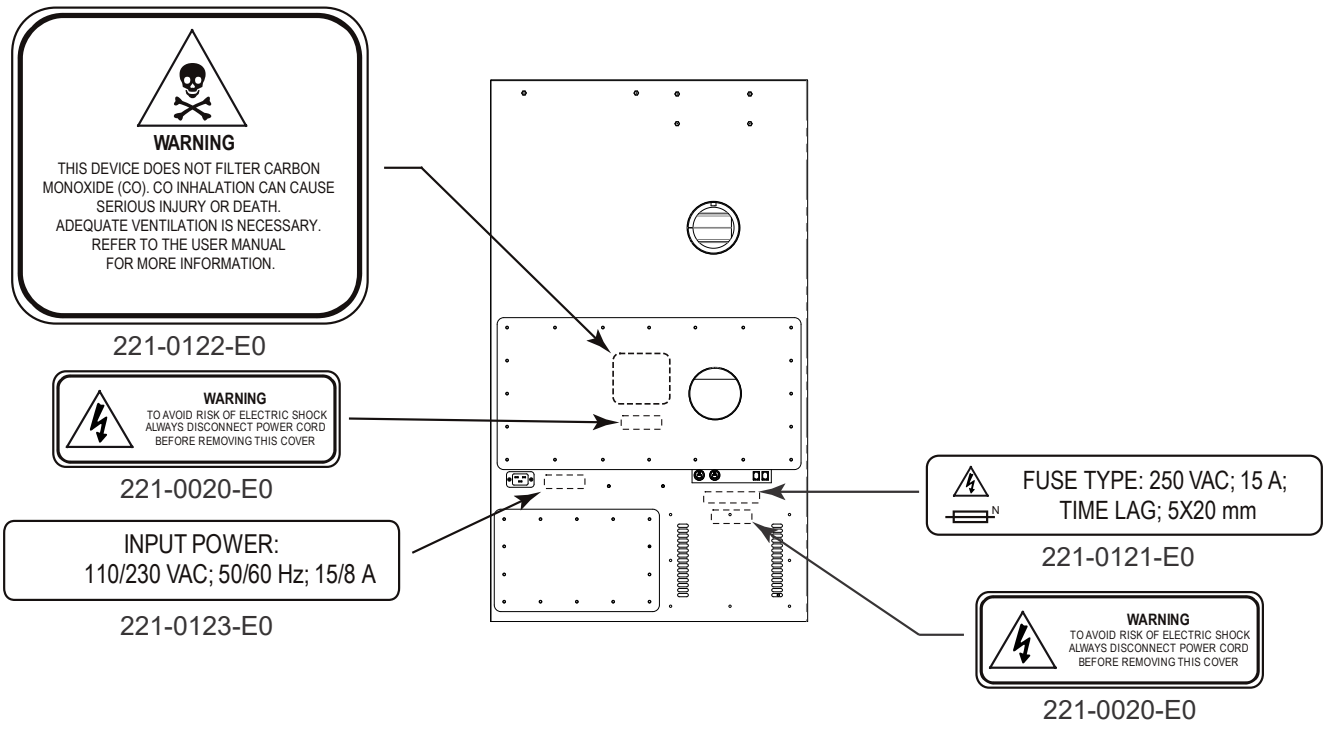
THIS AIR CLEANER IS DESIGNED AS A CLASS I, GROUP A, PLUGGABLE DEVICE.
It is also designed for connection to IT power systems.

Safety Labels

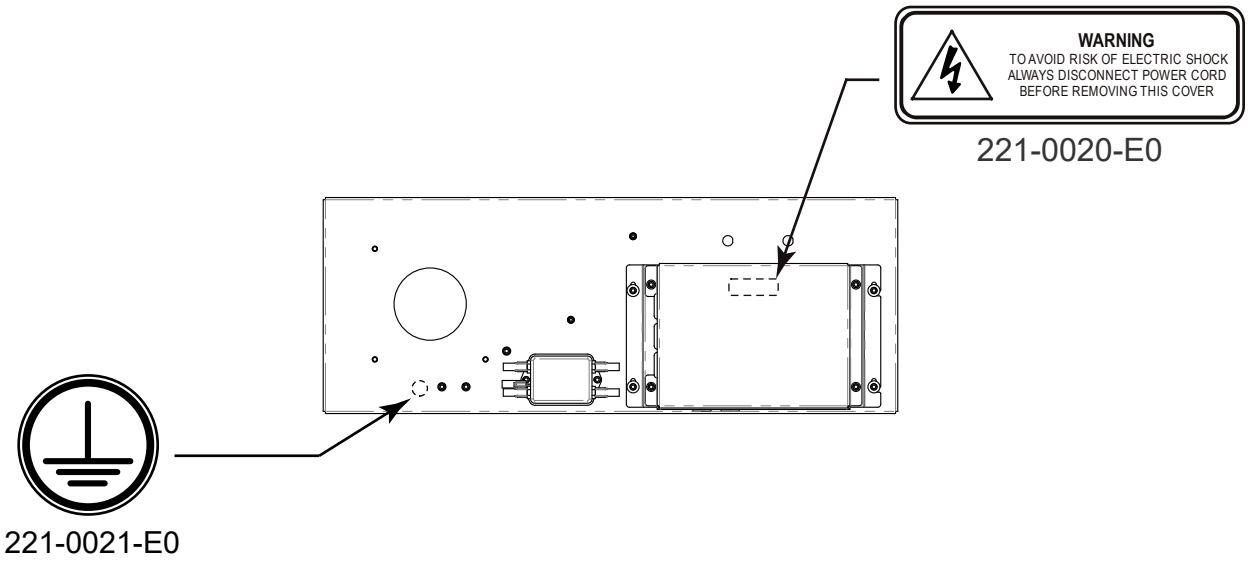
Safety labels are placed on each UAC to provide important safety information. Do not remove these labels for any reason. If the label(s) become damaged or have been removed for any reason, do not operate the air filtration system and immediately contact the ULS Factory Support Team at:
480-609-0297 (USA), +43 1 402 22 50-28 (Austria), +81 (45) 224-2270 (Japan) or email us at *support@ulsinc.com* for a free replacement.



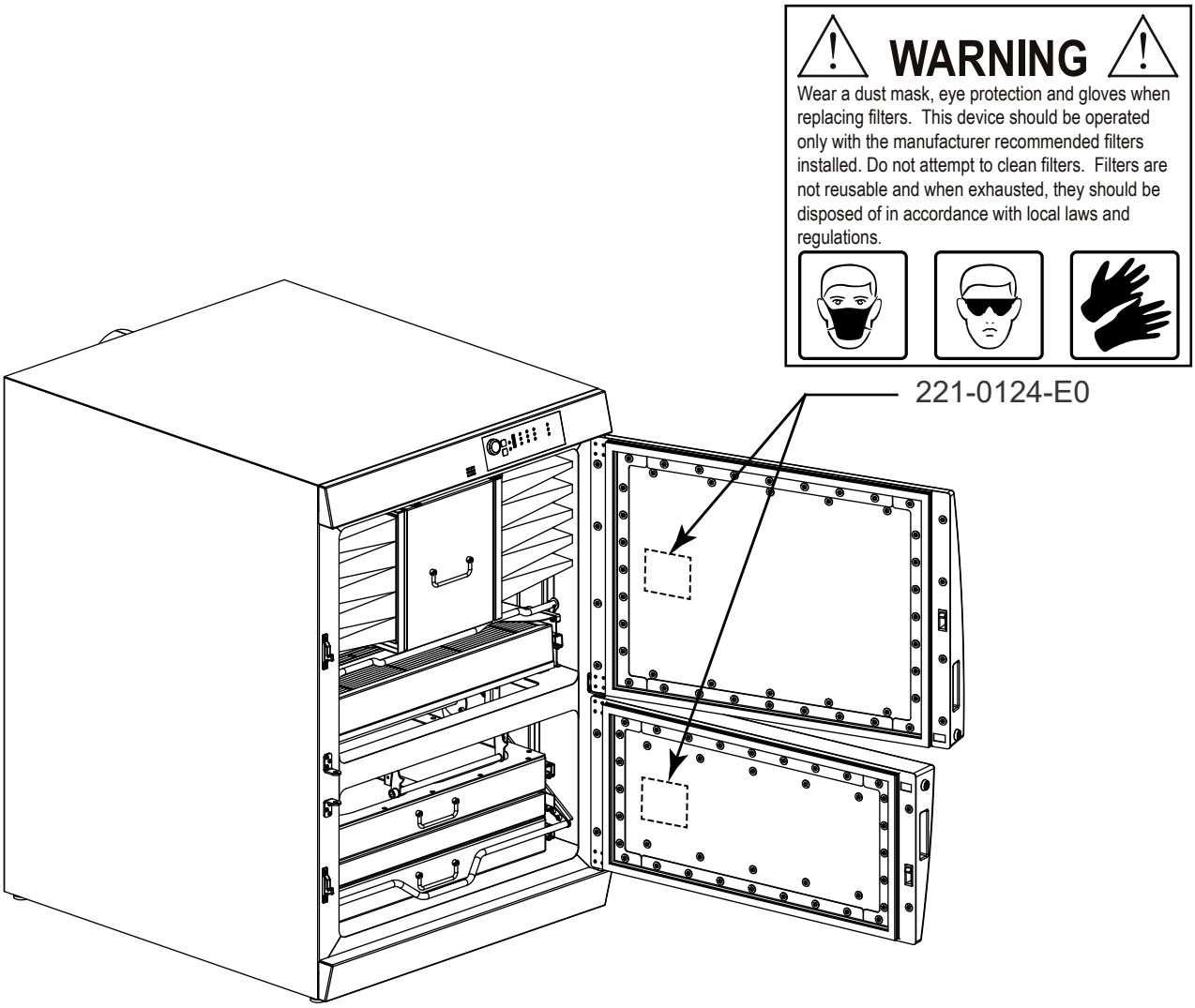
UAC 2000 Interior View Labels



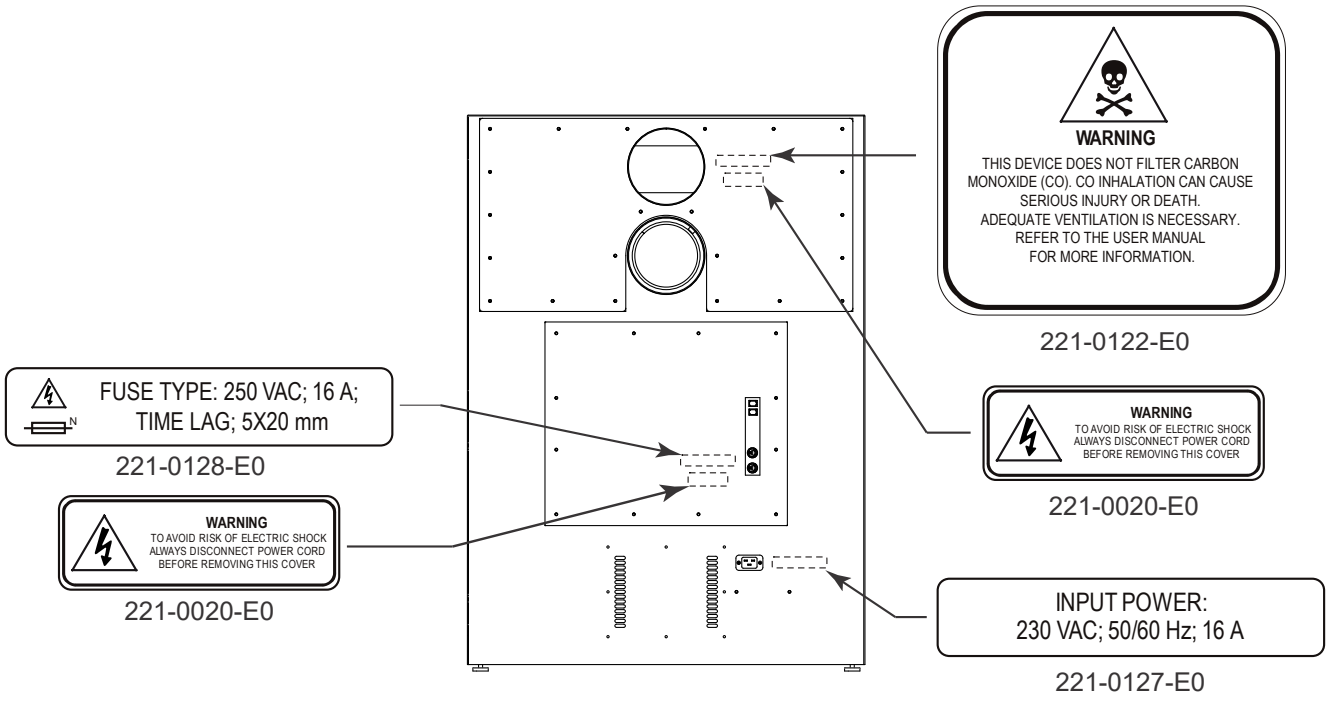
UAC 2000 Rear View Labels



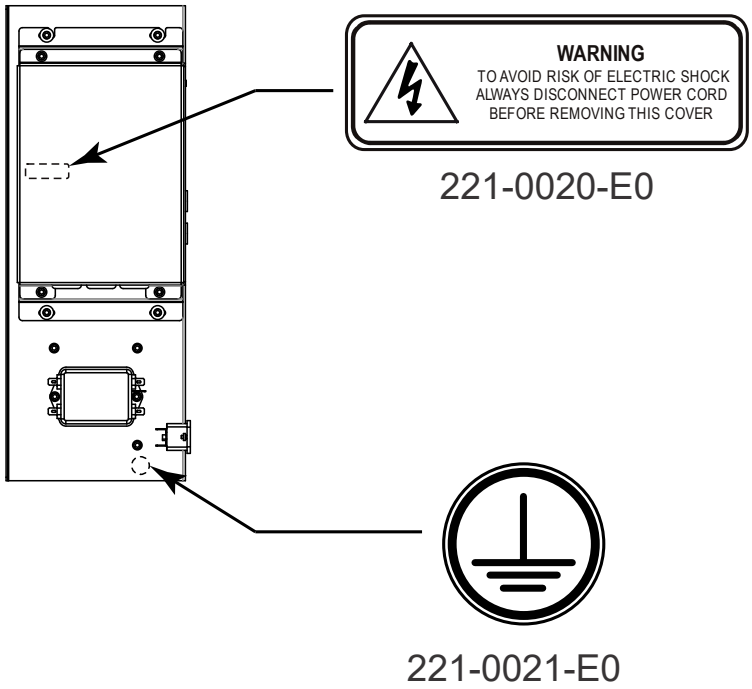
UAC 2000 Blower Bulkhead View Labels



UAC 4000 Interior View Labels



UAC 4000 Rear View Labels



UAC 4000 Power Entry Mounting View Labels

EU Declaration of Conformity

UNIVERSAL LASER SYSTEMS

Product Identification: All UAC Air Filters

Manufacturer:
Universal Laser Systems, Inc.
16008 N. 81st St.
Scottsdale, AZ 85260
USA

Authorized Representative:
Universal Laser Systems GmbH
Lerchenfelder Guertel 43
A-1160 Vienna/Austria

The manufacturer hereby declares that the equipment specified below is in conformity with the following directives:

2004/108/EEC (EMC Directive)
2006/95/EEC (Low Voltage Directive)
2006/42/EEC (Machinery Directive)
2002/95/EEC (RoHS Directive)
2002/96/ECC (WEEE Directive)

based on the standards listed:

Standards Used:

Safety:
EN 60950: 2002

EMC:
EN 61000-6-2 2005 (Class A)
EN 61000-6-4 2007 (Class A)
EN 61000-4-2: (4kV CD, 8kV AD)
EN 61000-4-3: (10 V/m)
EN 61000-4-4: (2 kV power line)
EN 61000-4-5: (class 3)
EN 61000-4-6: (10Vrms)
EN 61000-4-11

Note: This is not a declaration of conformity. The importer of this equipment supplies the declaration of conformity.

CAUTION: *This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.*

FCC Compliance

This ULS Advanced Air Filtration System has been tested and found to comply with Federal Communication Commission (FCC) directives regarding Electromagnetic Compatibility (EMC). In accordance with these directives, ULS is required to provide the following information to its customers.

FCC Compliance Statement and Warnings

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device as set forth in Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Users should be aware that changes or modifications to this equipment not expressly approved by the manufacturer could void the user's authority to operate the equipment.

This equipment has been type tested and found to comply within the limits for a Computing Device per FCC part 15, using shielded cables. Shielded cables must be used in order to ensure compliance with FCC regulations.

Recycling

Universal Laser Systems is committed to helping reduce the amount of waste electronics ending up in municipal landfills and is equipped to recycle any of its products. Consumers are urged to recycle this product or to contact Universal Laser Systems for assistance with their recycling options.

To arrange for recycling of a ULS product or accessory, please contact the ULS Factory Support Team for more information at: +1 480 609-0297 (USA), +43 1 402 22 50-28 (Austria), +81 (45) 224-2270 (Japan) or e-mail us at *support@ulsinc.com*.

Getting to Know the System 3

System Overview

UAC 4000 Front View

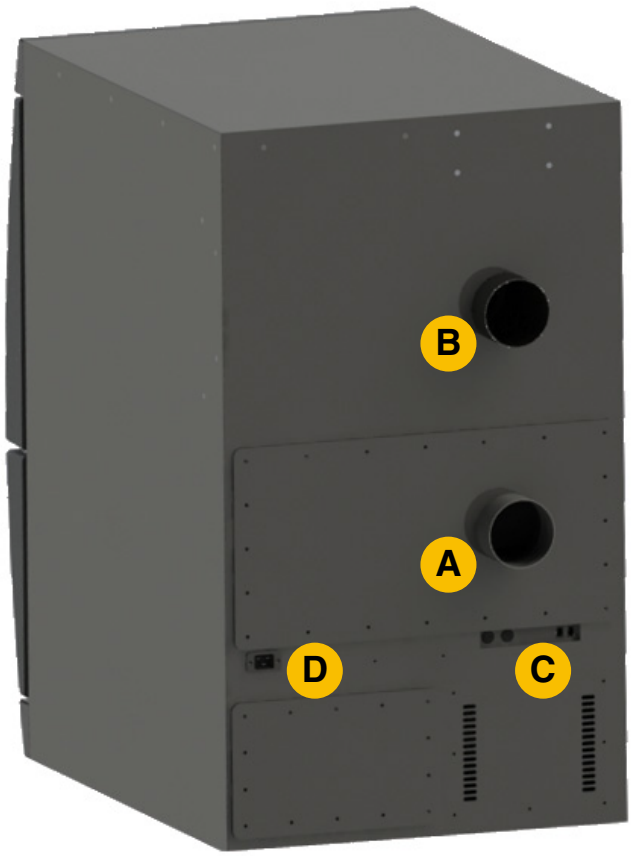
A	Power/Emergency Stop	Instantly disconnects all AC power to the blowers of system when depressed.
B	Control Panel	Serves as the main control center for the UAC. The control panel allows for manual control in stand-alone mode in addition to displaying the filter status of the air filtration unit.
C	Top Door	Allows access to the Pre- and HEPA filters.
D	Bottom Door	Grants access to the Carbon filters.

UAC 2000 Front View with Doors Open

A	Pre-Filter	Captures large particulates.
B	HEPA Filter	Captures fine particulates.
C	Carbon Filters	Removes VOCs from air flow.

UAC 4000 Front View with Doors Open

A	Pre-Filter	Captures large particulates.
B	HEPA Filter	Captures fine particulates.
C	Carbon Filters	Removes VOCs from air flow.



UAC 2000 Back View

A	Exhaust Port	Expels cleaned air from the UAC.
B	Intake Port	Draws in effluent from connected laser system.
C	Communication Ports	Provide a communication connection between a ULS laser system and the UAC for automatic control.
D	Power Connection	Provides power to the UAC.

UAC 4000 Back View

A	Exhaust Port	Expels cleaned air from the UAC.
B	Intake Port	Draws in effluent from connected laser system.
C	Communication Ports	Provide a communication connection between a ULS laser system and the UAC for automatic control.
D	Power Connection	Provides power to the UAC.

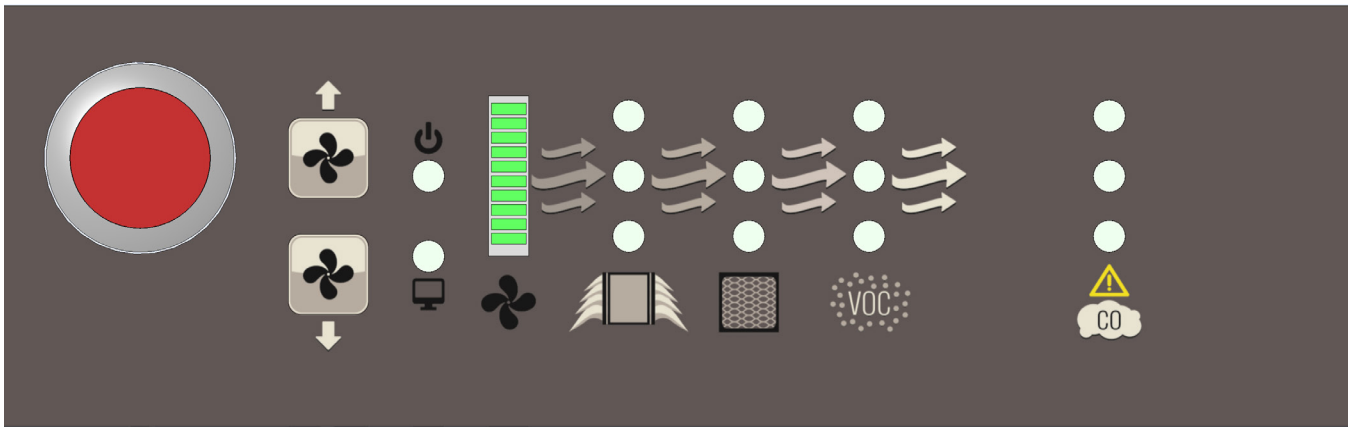
Control Panel Overview

The Control Panel, a button panel located on the top portion of the UAC, provides the functions necessary to operate the air filtration system.

The Control Panel contains two main sections:

- Airflow Adjustment and Power
- Filter Status

> ***NOTE:*** *For complete instructions on using the controls on the Control Panel, see the UAC Control Panel section of this user guide.*



Control Panel Main Screen

Installation 4

This section provides detailed instructions for site preparation, installation, and connection of UAC Air Filtration Systems. Follow the instructions in the order shown.

1. Site Preparation
2. Installing and Connecting Your UAC.

> ***NOTE:*** *Damage to the UAC due to inadequate or improper installation or operation is not covered under the Universal Laser Systems (ULS) Warranty. See the ULS Warranty for additional information. A ULS Warranty document is supplied with your laser system. Should you require a copy of the Warranty, please contact the ULS Factory Support Team at 480-609-0297 (USA), +43 1 402 22 50-28 (Austria), +81 (45) 224-2270 (Japan) or e-mail us at support@ulsinc.com.*

Please refer to the *Safety* section before installing and operating this product.

Site Preparation

Operating Environment

The following should be considered prior to installing the UAC Air Filtration Systems.

- The UAC must be installed in an office, laboratory, workshop or light-duty manufacturing environment.
- Dusty or dirty environments can cause the filters to deplete quickly. Keep your laser system and the UAC isolated from any processes that produce airborne particles such as sandblasting, sanding, machining, etc. Also, isolate the equipment from any machinery requiring mists of oil or water for lubrication. Airborne dust and liquids can coat and damage components.
- Avoid small, enclosed, non-ventilated areas. Some materials, after laser processing, continue emitting fumes for extended periods. These materials present in a confined unventilated room can create a health hazard.
- Operate the UAC between the ambient temperatures (non-condensing) of 70ºF (21ºC) and 78ºF (25ºC).
- The UAC should be at least 1 foot (300 mm) away from any wall or obstruction to allow for access and to avoid kinks in the hoses.

Electrical Power Source

The following should be considered in relation to the electrical power source.

- The UAC 2000 requires a 110/210-230VAC 8/15A power source while the UAC 4000 requires a 210-230VAC 15A power source to operate; refer to the “INPUT POWER” on the back of the unit.

CAUTION: *Never remove the ground lead to the electrical cord and plug the UAC into a non-grounded outlet. A UAC that is not properly grounded is hazardous and has the potential to cause severe or fatal electrical shock. Without proper grounding, the UAC could exhibit sporadic or unpredictable behavior. Always plug the system into a properly-grounded (earthed) outlet.*

Noisy or unstable electricity and voltage spikes may cause a number of undesirable or harmful effects:

- Interference with communications between the UAC and laser system, and/or
- Possible damage to the electronics of the UAC.

If electrical power fluctuations, brown outs, or constant power outages are a problem in your area, please contact your local Electrician to obtain an appropriate power isolation and regulation appliance.

Exhaust Hoses

The following should be considered in relation to the exhaust hoses.

- ULS recommends directing exhaust from UAC air cleaners to the outside environment when ever possible. Exhaust hoses for external ventilation (user supplied) must be capable of supporting a minimum amount of static pressure. For more information, consult with a licensed HVAC contractor or call the ULS Factory Support Team.
- ULS supplies connection kits for connecting UAC air filters to ULS laser systems. ULS kits are designed for placing the UAC close to the laser system which is highly recommended. If the location of the UAC requires additional hose or rigid pipe runs, we recommend you consult with a licensed HVAC contractor to meet local safety and building codes.

Installing and Connecting Your UAC

Familiarize yourself with these instructions before getting started.

The next steps in installation are to connect the exhaust hoses and communication cables, verify that the filter cartridge(s) are properly installed, level the UAC, and make the final connections.

CAUTION: *Do not attempt to move or lift the UAC alone. Obtain assistance from additional people when lifting or carrying. Make sure to lock casters (if attached) and close doors before lifting. Injury may occur if improper lifting techniques are used or the UAC is dropped.*

Unpacking and Installation

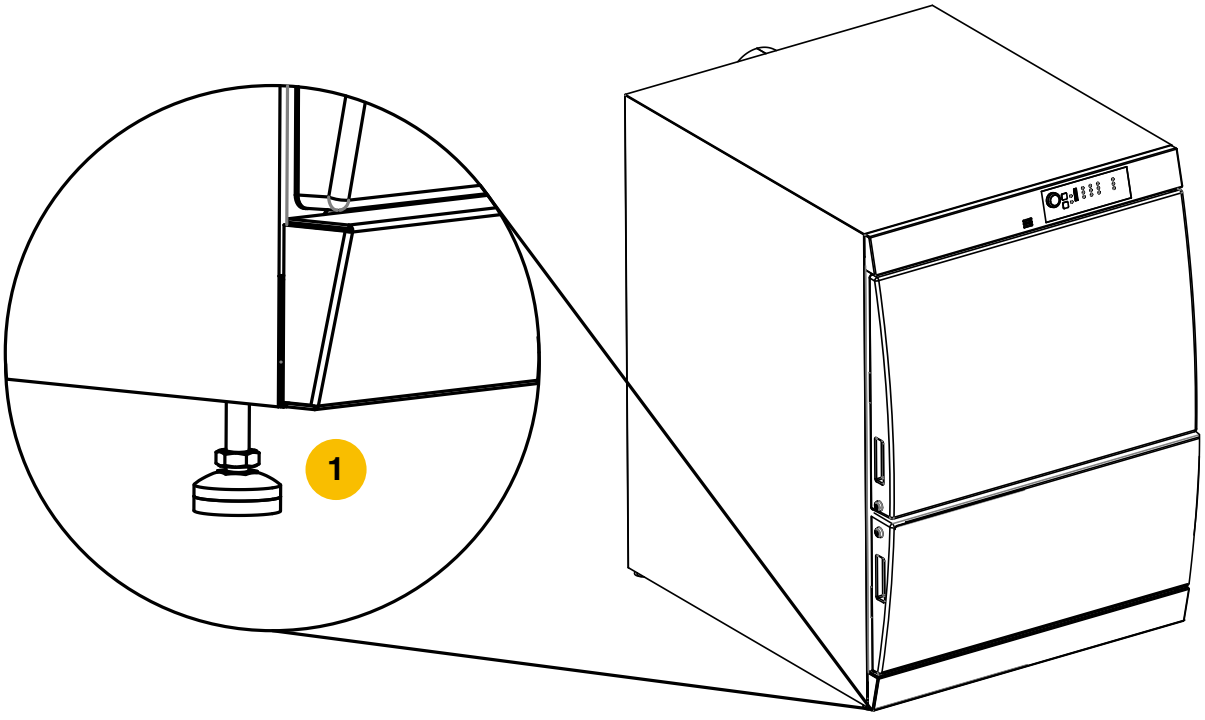
The UAC is shipped fully assembled. To unpack it from the shipping crate, perform the following steps.

1. Unpack the UAC from the shipping crate by first removing the top and side panels.
2. Lift the UAC off the base of the crate and move the UAC to the location where you intend to operate it and lock the casters (if used).

Leveling

Once the air filtration system is in place, level it using the leveling nuts provided. Leveling is not possible if casters are in use.

1. Adjust the leveling feet (1) as necessary so that all four feet are in contact with the floor and the unit does not rock.



Exhaust Adapter Kit Assembly

Each UAC ships with an Exhaust Adapter Kit specifically tailored to the laser system to which you will be connecting the UAC. Below you will find the available kits and the instructions on how to assemble them.

NOTE: *ULS does not provide any additional equipment to connect to a building's external ventilation port. If ventilation outside is needed we recommend you consult with a licensed HVAC contractor to meet local safety and building codes.*

UAC 2000 - 4 in. (101.6 mm) to 4 in. (101.6 mm)

For use with a VLS3.60, VLS4.60 or PLS4.75, components include:

- (2) 4 in. (101.6 mm) hose clamps
- (1) length of 4 in. (101.6 mm) flexible rubber exhaust hose

No assembly instructions required. Proceed to the *Finalizing the Connections* section of this user guide.

UAC 4000 - 6 in. (152.4 mm) to 4 in. (101.6 mm)

For use with a VLS3.60, VLS4.60 or PLS4.75, components include:

- (1) 6 in. (152.4 mm) to 4 in. (101.6 mm) duct reducer
- (2) 4 in. (101.6 mm) hose clamps
- (2) 6 in. (152.4 mm) hose clamps
- (1) length of 4 in. (101.6 mm) flexible rubber exhaust hose
- (1) length of 6 in. (152.4 mm) flexible rubber exhaust hose

1. Insert the 6 in. (152.4 mm) port of the reducer into the 6 in. (152.4 mm) hose and secure with a 6 in. (152.4 mm) hose clamp.
2. With a 4 in. (101.6 mm) hose clamp, insert and secure the 4 in. (101.6 mm) hose to the 4 in. (101.6 mm) port of the reducer.

When using this kit, the 6 in. (152.4 mm) section of hose will be connected to the intake port of the UAC 4000 while the 4 in. (101.6 mm) hose is connected to the exhaust port of the laser system.

UAC 4000 - 6 in. (152.4 mm) to 6 in. (152.4 mm)

For use with XLS series systems, components include:

- (2) 6 in. (152.4 mm) hose clamps
- (1) length of 6 in. (152.4 mm) flexible rubber exhaust hose

No assembly instructions required. Proceed to the *Finalizing the Connections* section of this user guide.

UAC 4000 - 6 in. (152.4 mm) to Dual 4 in. (101.6 mm)

For use with a VLS 6.60, PLS6 series or ILS series system, components include:

- (1) 3-way duct connector, 6 in. to 4 in. to 4 in. (152.4 mm to 101.6 mm to 101.6 mm)
- (2) 6 in. (152.4 mm) hose clamps
- (4) 4 in. (101.6 mm) hose clamps
- (1) length of 6 in. (152.4 mm) flexible rubber exhaust hose
- (2) lengths of 4 in. (101.6 mm) flexible rubber exhaust hose

1. Insert the 6 in. (152.4 mm) port of the 3-way duct connector into the 6 in. (152.4 mm) hose and secure with a 6 in. (152.4 mm) hose clamp.
2. With 4 in. (101.6 mm) hose clamps, insert and secure, the 4 in. (101.6 mm) hoses to the 4 in. (101.6 mm) ports on the 3-way duct connector.

When using this kit, the 6 in. (152.4 mm) section of the hose will be connected to the intake port of the UAC 4000, while the two 4 in. (101.6 mm) sections of hose are connected to the exhaust ports of the laser system.

UAC 4000 - 6 in. (152.4 mm) to Triple 4 in. (101.6 mm)

For use with an ILS series system with the Traveling Exhaust optional laser processing support module, components include:

- (1) 4-way duct connector, 6 in. to 4 in. to 4 in. to 4 in. (152.4 mm to 101.6 mm to 101.6 mm to 101.6 mm)
- (2) 6 in. (152.4 mm) hose clamps
- (6) 4 in. (101.6 mm) hose clamps
- (1) length of 6 in. (152.4 mm) flexible rubber exhaust hose
- (3) lengths of 4 in. (101.6 mm) flexible rubber exhaust hose

1. Insert the 6 in. (152.4 mm) port of the 4-way duct connector into the 6 in. (152.4 mm) hose. Secure with hose clamp.
2. With 4 in. (101.6 mm) hose clamps, insert and secure, the 4 in. (101.6 mm) hoses onto the 4 in. (101.6 mm) ports of the 4-way duct connector.

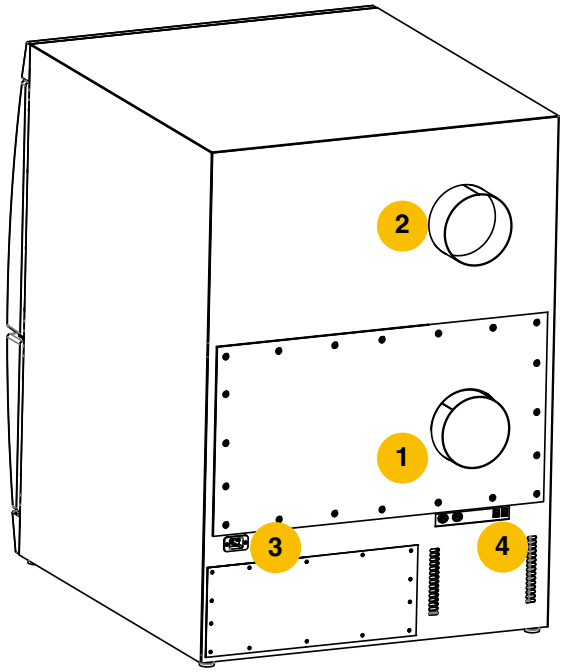
When using this kit, the 6 in. (152.4 mm) section of the hose will be connected to the intake port of the UAC 4000, while the three 4 in. (101.6 mm) sections of hose are connected to the exhaust ports of the laser system.

NOTE: *For additional information on connecting exhaust hoses to a ULS laser system, please refer to the Operation Manual for that specific system.*

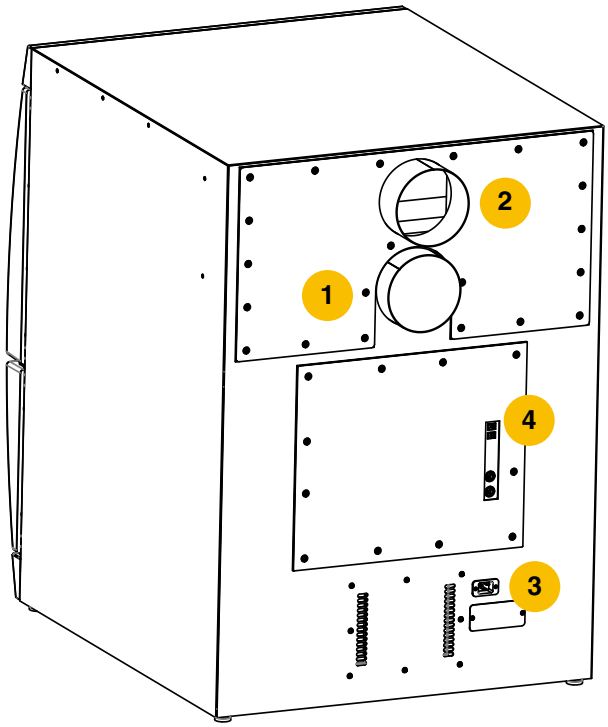
Finalizing the Connections

Make the following connections in the order described; otherwise static electricity can potentially damage the UAC, the computer, and/or the system electronics.

1. Connect the intake hose from the assembled Exhaust Adapter Kit and secure it to the intake port (1) of the UAC with the provided hose clamp.
2. Connect the exhaust port hose(s) from the assembled Exhaust Adapter Kit and secure it to the exhaust ports of the laser system with the provided hose clamp(s).
3. (Optional) Connect a 4 or 6 in. (101.6 or 152.4 mm) flexible rubber hose (not provided) from the exhaust port (2) on the rear of the UAC to the building's external ventilation port.
4. Connect the UAC power cord to the power inlet of the UAC (3) and then to a grounded electrical outlet.
5. Connect one end of the communication cable to either one of the communication ports on the back of the UAC (4) and the other end to an open accessory communications port on your ULS laser system.



UAC 2000



UAC 4000

6. Connect any additional accessories, such as the ULS Compressed Air Source, to an open communication port (4) on the UAC, if necessary.

CAUTION: *International users - if using an adapter or replacement power cord for local outlets, make sure that you attach the adapter correctly to the power cord and that you are using a properly-grounded (earthed) adapter and power.*

Description & Operation 5

Overview

As a ULS laser system processes material, it can create particulates and volatile fumes as a by-product of material processing. These particulates and volatile fumes mix with air to create an effluent stream that is pulled through the ULS laser system's exhaust into the UAC Air Filtration System. The effluent stream travels through a series of filters that first remove the large particulates, then fine particulates, and finally adsorb the Volatile Organic Chemicals (VOCs).

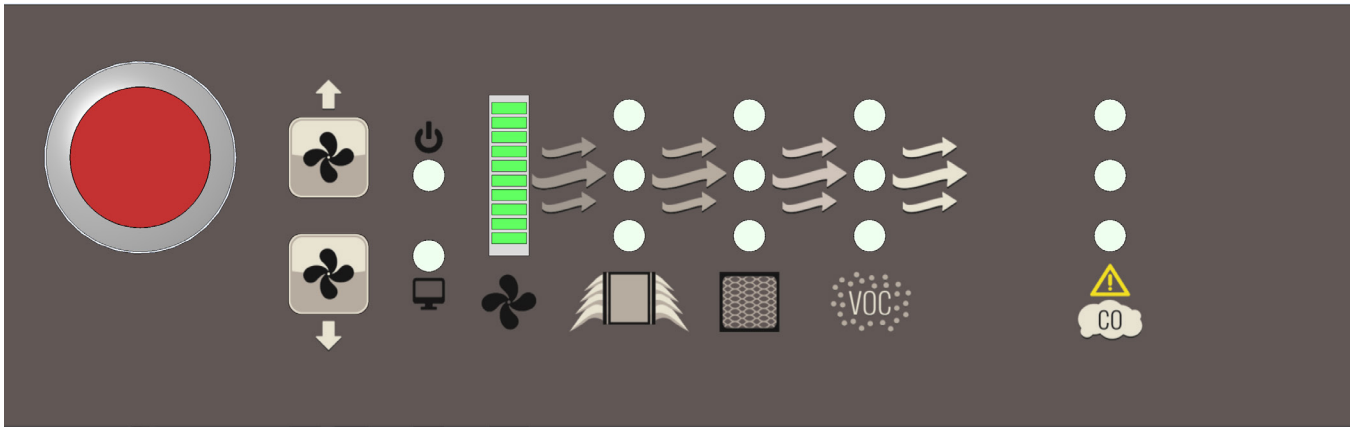
The system can operate as both a stand-alone device and in automatic mode when connected to a (VLS,PLS,ILS,XLS) laser system. Automatic mode is the most efficient way to operate the UAC. It automatically switches ON from standby when laser processing begins and returns to standby after laser processing stops. The UAC monitors itself and the effluent stream, and notifies the user when filters are nearing depletion. If a safety issue is detected, the UAC prevents the connected laser system from processing material until the issue is resolved.

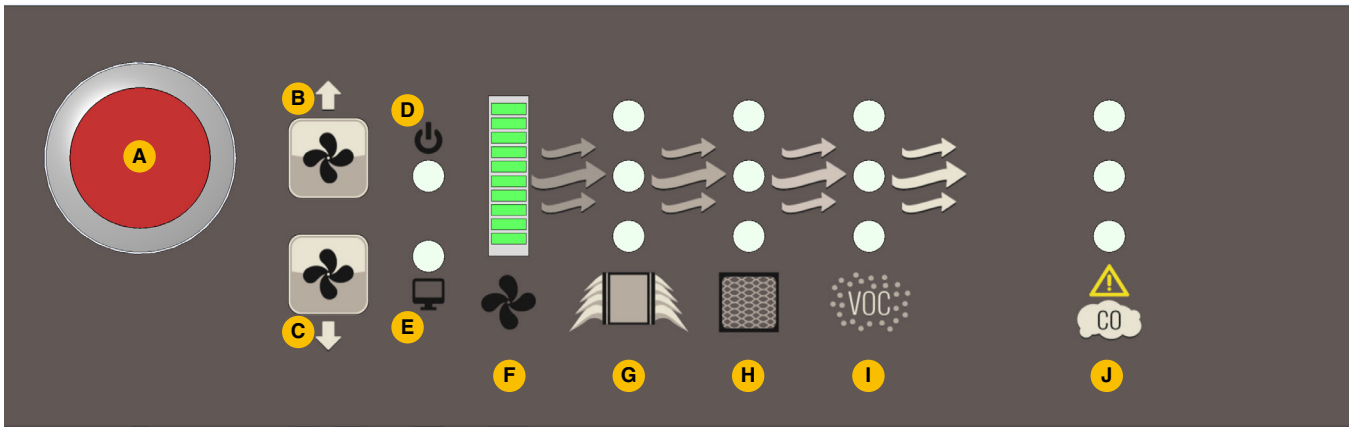
Description

If the UAC is connected with a ULS laser system and computer, it can automatically run when the laser system is in use. When used independent of a laser system, it can maintain a manually selected flow level and alert when a filter is depleted through its control panel.

UAC Control Panel

The Control Panel, located on the front of the UAC, provides the functions necessary to run in stand-alone mode. If the UAC is connected to a laser system, it will automatically run when the laser system is processing material. Regardless of the mode used the UAC Control Panel will display the blower speed level and status of the three filter stages in the unit.





A	Power/Emergency Stop	Instantly disconnects AC power to the blowers in the Air Filtration System when depressed.
B	Increase Blower Speed	Press to increase blower speed.
C	Decrease Blower Speed	Press to decrease blower speed.
D	System Power	Indicates if the UAC is receiving power. • OFF - UAC is powered off. • Solid Green - Air Filtration System is powered on.
E	Communication	Indicates if the UAC is communicating with a connected laser system. • Solid Green - The unit is connected to and communicating with a computer running the laser system control software. • Blinking Green - A connected computer running the laser system control software is controlling the unit. The green light will not illuminate when running in stand-alone mode.
F	Blower Speed Indicator	Indicates the speed at which the blowers are running.
G	Pre-Filter Status	Displays filter saturation status for the Pre-Filter. • Green - Filter is in good condition. • Yellow - Filter requires replacement soon. • Red - Filter requires immediate replacement.
H	HEPA Filter Status	Displays filter saturation status for the HEPA Filter. • Green - Filter is in good condition. • Yellow - Filter requires replacement soon. • Red - Filter requires immediate replacement.

I	Carbon Filter Status	Displays filter saturation status for the Carbon Filter. • Green - Filter is in good condition. • Yellow - Filter requires replacement soon. • Blinking Yellow - Top filter is depleted and needs to be replaced. See *Carbon Filter* in the *Filters and Status* section of this User Guide for additional information. • Red - Filters, both top and bottom, require immediate replacement.
J	CO Sensor	Displays status of the CO sensor. • Green - No CO detected. • Yellow - CO detected below *OSHA PEL*. • Red - CO detected above *OSHA PEL*.

Power/Emergency Stop

The Power/Emergency Stop (E-stop) button is used to cut power to the main blowers when not in use or in emergency situations. The button is located on the left side of the Control Panel on the front of the UAC.

To use the button, do the following.

- Press the button; it immediately cuts the power to the blowers causing them to stop operating.

> ***NOTE:*** *It will also send a hard fault condition to the* laser control software *(if being used), that will stop laser processing in progress and prevent any laser processing from starting until the button is disengaged.*

When pressed, the button is indented.

To disengage the button, do the following.

- Press the button; it will return to its raised position and allow the air filtration system and laser system (if being used) to operate.

Fan and Blower Power

Automatic Mode

When the UAC is operating in automatic mode, the blowers turn on when laser processing begins and turn off when laser processing stops. When the blowers are on, the air filtration system pulls particulates and volatile chemicals away from the cutting surface and through the air filtration system. The laser control software manages the speed of the blowers to generate proper air flow. When the laser system is not in use, the laser control software maintains the UAC in a standby mode, where a low volume of air is circulated through the unit by a standby fan to prevent off-gassing. In standby mode, no air is pulled from the laser system.

Stand-Alone Mode

When the UAC is operating in stand-alone mode, or when the laser control software is not controlling the air filtration system, the blower speed is controlled from the UAC Control Panel.

To operate the blowers, do the following.

1. Press the **Blower Speed** buttons to increase or decrease the flow of air.

Power Fan Indicator	Acu State	Blower Speed	Blower Speed Indicator	Standby Fan
10 illuminated Segments	Full Speed	100%	ON	OFF
9 illuminated Segments	90%	90%	ON	OFF
8 illuminated Segments	80%	80%	ON	OFF
7 illuminated Segments	70%	70%	ON	OFF
6 illuminated Segments	60%	60%	ON	OFF
5 illuminated Segments	50%	50%	ON	OFF
4 illuminated Segments	40%	40%	ON	OFF
3 illuminated Segments	30%	30%	ON	OFF
2 illuminated Segment	Blowers off	0%	ON	ON
1 illuminated Segment	Standby	0%	OFF	ON
No illuminated Segments	Off	0%	OFF	OFF

NOTE: *When the UAC communication cable is connected to a ULS laser system, the laser control software will override and lock out stand-alone operation of the UAC during laser processing.*

Filters and Status

There are four filter stages in the UAC, a one- or two-sided Pre-filter, a HEPA filter, and two Carbon filters. The UAC Control Panel contains filter status lights to indicate when the filters are consumed and replacement filters are needed. The different states are described below. Refer to the *UAC Control Panel* description table for more information about each filter's status indicators.

- Solid or blinking green light – Indicates when each filter stage is working correctly.
- Solid or blinking yellow light – Indicates that the filter will soon need to be replaced. In the case of the Carbon filter, a blinking yellow light indicates that the top filter needs to be replaced.
- Red light – Indicates the filter has been consumed and requires replacement.

NOTE: *In the event that a filter becomes depleted, the UAC will not run in automatic mode nor will it allow the ULS laser system to process material. Refer to Maintaining the System for information on filter replacement.*

CAUTION: *If the UAC is being used in stand-alone mode, the system will continue to operate and the status lights must be watched to prevent exposure to VOCs and particulates.*

Pre-Filter

The one or two Pre-filters are the first stage of the UAC air filtration process. It captures large particulates.

HEPA Filter

The HEPA filter is the second stage of the UAC air filtration process. It captures finer particulates.

Carbon Filter

The two Carbon filters are the third and fourth stage of the UAC air filtration process. They capture VOCs and are comprised of activated carbon. The unique dual Carbon filter stage in the UAC provides a more complete usage of the filters. When the upper carbon filter is exhausted, the lower carbon filter continues to work, and the lower carbon filter can be used to replace an exhausted upper filter in a rotation schedule. Refer to the *Carbon filters* section of *Maintaining the System* for additional information.

CO Sensor Status

The UAC utilizes CO sensors to assist in determining safe CO levels in the environment around the UAC as per the OSHA Permissible Exposure Limit (PEL) of 55 ppm 55mg/m^3 TWA. The UAC Control Panel contains CO indicator lights to identify current CO levels in the surrounding air. The different states are described below.

- Green - Indicates that no CO is detected.
- Yellow - Indicates that CO has been detected below the OSHA PEL.
- Red - Indicates that CO has been detected above the OSHA PEL. A buzzer will also sound when this level is reached.

NOTE: *Automatic Mode: In the event that the CO sensors detects CO emission above the OHSA PEL the connected ULS laser system will stop and/or prevent processing.*

CAUTION: *Stand-Alone Mode: If the UAC is being used in stand-alone mode the system will continue to operate regardless of the CO emission level and must be watched to prevent over-exposure. A warning buzzer will sound when CO exceeds OSHA PEL limits.*

Maintaining the System 6

Cleaning and Maintenance

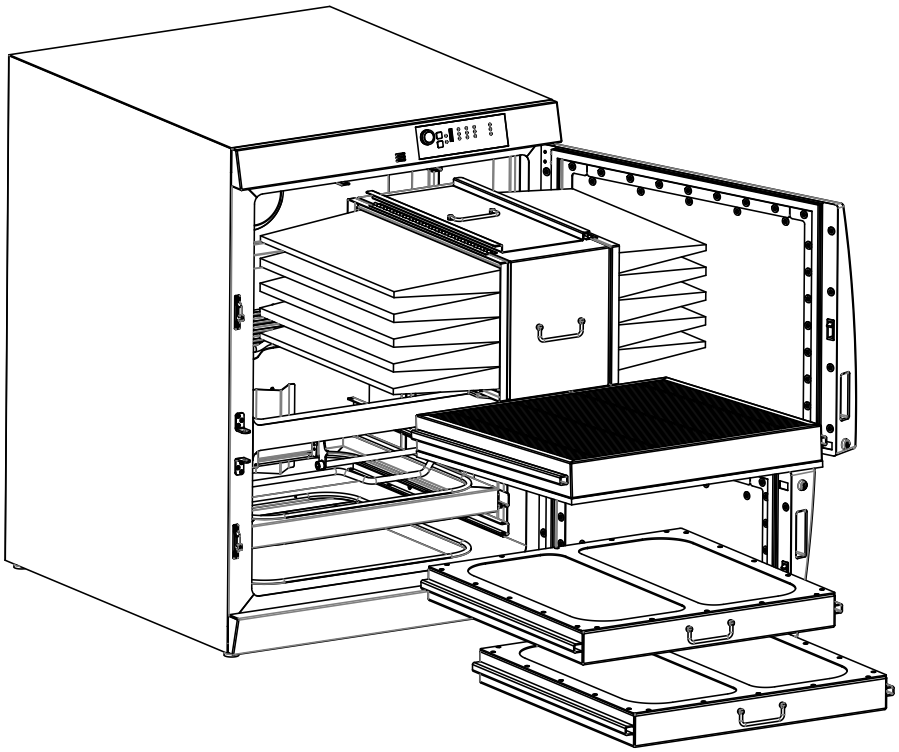
Routine maintenance will need to be performed on the Air Filtration System to ensure proper functionality. Completing these actions will increase the longevity of the system with minimal time investment.

- Use a cotton cloth or paper towel to wipe down the interior and exterior of the unit as needed. Do not use alcohol, acetone or any other harsh chemical as these may damage the finish.
- Periodically inspect rubber seals for wear or damage and replace if necessary.
- Replace filters when depleted.

QUESTIONS? *Contact the ULS Factory Support Team.* +1 480 609-0297 (USA), +43 1 402 22 50-28 (Austria), +81 (45) 224-2270 (Japan), email us at: *support@ulsinc.com*

Changing Filters

When filters become depleted, new filters are available for purchase from ULS. Contact the ULS Factory Support Team to order replacement filters and ensure proper operation of your UAC. The following instructions are provided to assist you with changing the filters.

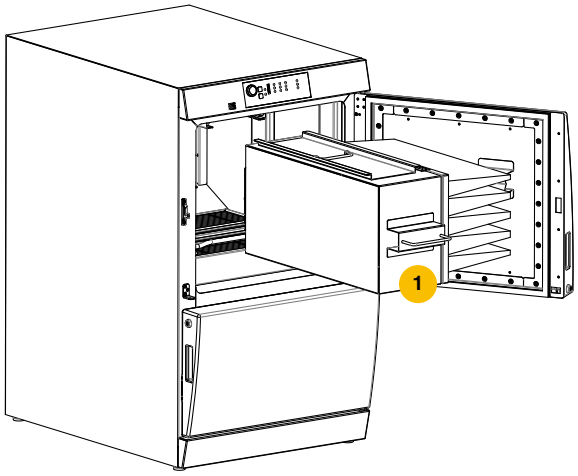


NOTE: *The filters should not be cleaned, and should be disposed of in accordance with local and government regulations.*

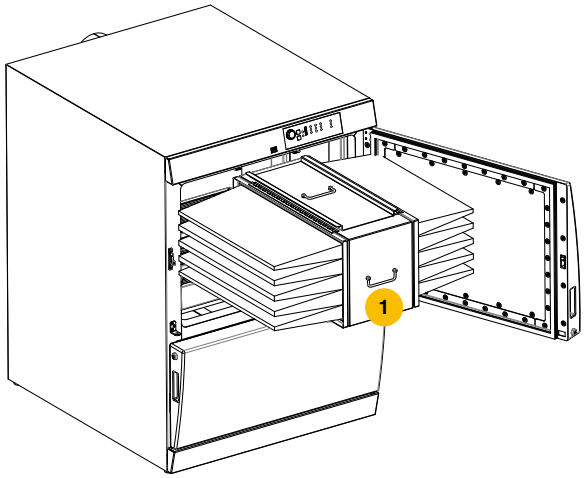
Pre-Filters

When the filter status of the Pre-filter turns red, replace the Pre-filter(s). To change the Pre-filters, perform the following steps. The Pre-filters are located in the upper chamber.

1. Open the top front door and, using the handle on the filter case (1), pull the Pre-filter case out, removing it from the main enclosure.



UAC 2000

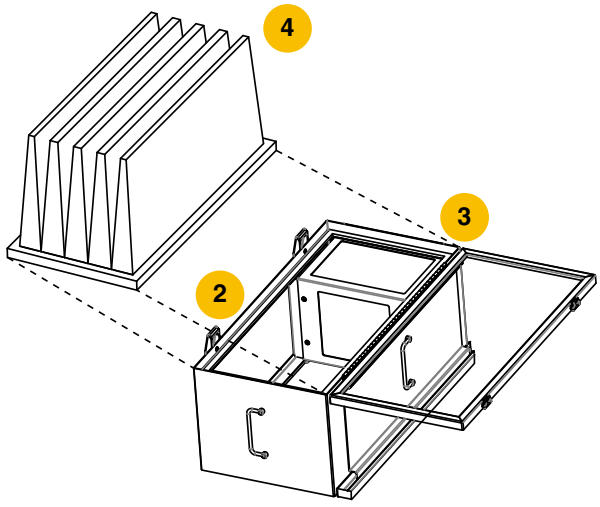


UAC 4000

2. Place the case on its side so one filter is on the top.
3. Disengage the latches and (2), rotate the door frame into the open position (3) (approximately 160 degrees from the locked position).

NOTE: *To avoid damaging the Pre-filter case, make sure to not force the frame past the 160 degree position.*

4. Remove and dispose of the depleted Pre-filter (4).



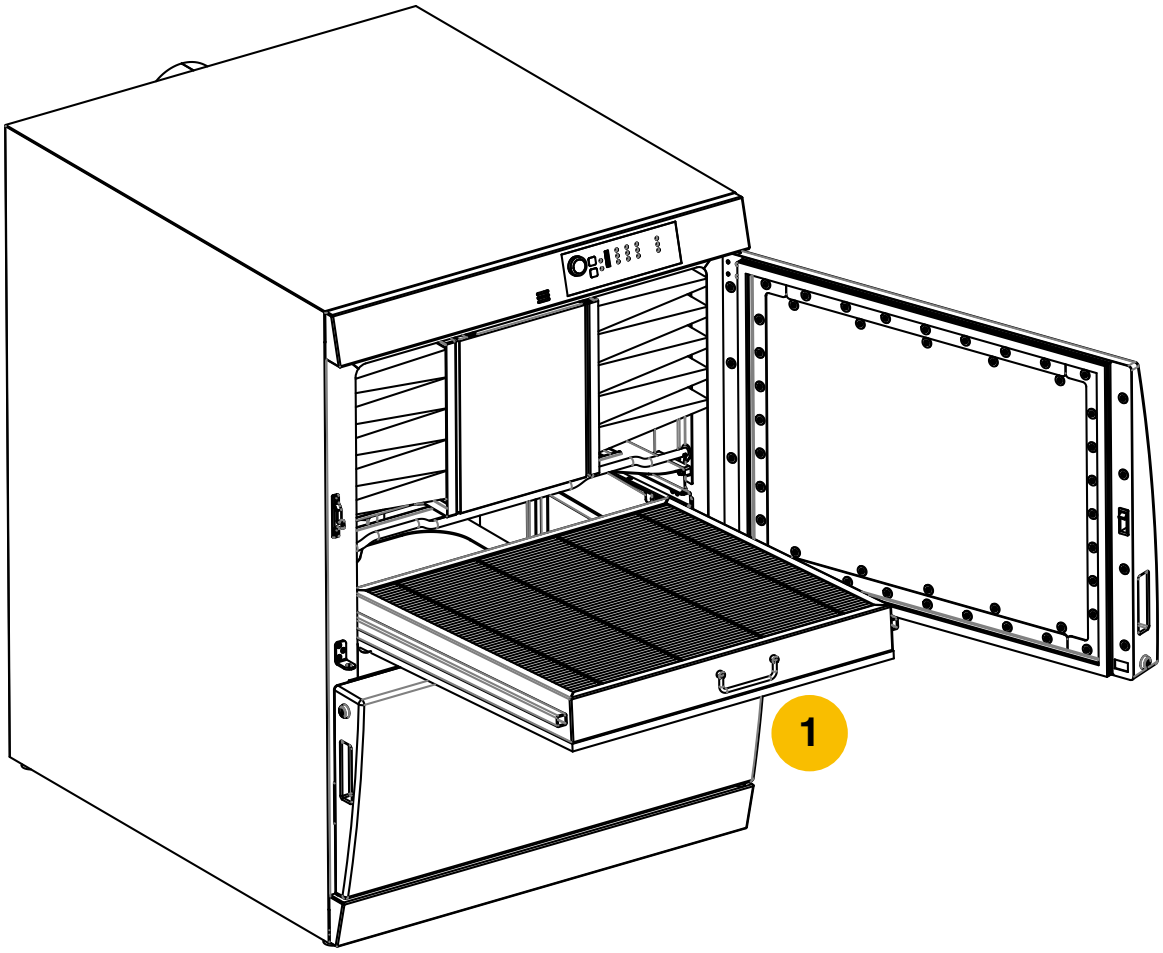
5. With the Pre-filter removed, inspect the Pre-filter screen and enclosure. If excessively contaminated, use a shop vacuum to remove excess debris.
6. Inspect the rubber seal on the back of the case that engages the intake tube of the UAC and the foam seal(s) used to create a seal between the case and the Pre-filter(s), replace if necessary.
7. Place a new Pre-filter received from the ULS Factory Support Team into the Pre-filter case so that the pockets are on top and away from the Pre-filter case.
8. Rotate door frame back into the locked position making sure to feed the Pre-filter pockets through the opening of the frame and re-engage the latches. If replacing the Pre-filter on a UAC 2000 please skip Step 9 and move on to Step 10.
9. Turn the Pre-filter case over on its opposite side so that the other Pre-filter is on top and repeat previous steps.
10. Return the Pre-filter case onto the top rail of the main enclosure and push it into the air filtration system until it touches the back of the cabinet. You will feel resistance as the filter case seal comes into position with the intake pipe.

CAUTION: *The filters in the air filtration system are very heavy and must be supported properly when being removed from and loaded into the system.*

HEPA Filters

When the filter status of the HEPA filter turns red, replace the HEPA filter. To change the HEPA filter, perform the following steps. The HEPA filter is located in the upper chamber, below the Pre-filters.

1. Move the HEPA lock lever into the open position (high); the filter will be slightly raised at roughly a 10-degree angle.



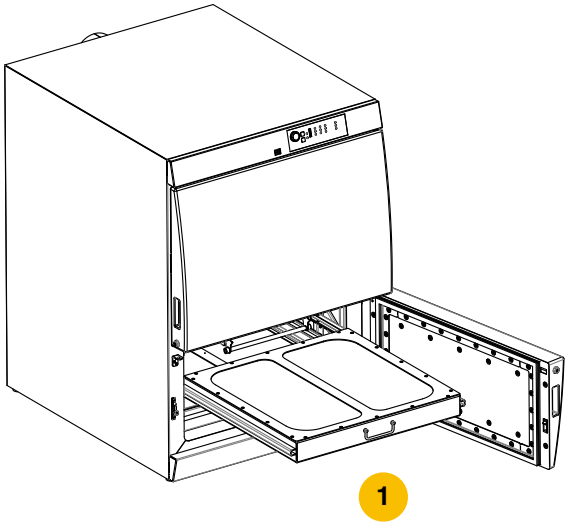
2. Remove and dispose of the depleted HEPA filter (1).
3. With the gasket facing downward, slide the new HEPA filter along the rails until it touches the back of the cabinet.
4. Move the HEPA lock lever into the closed position.

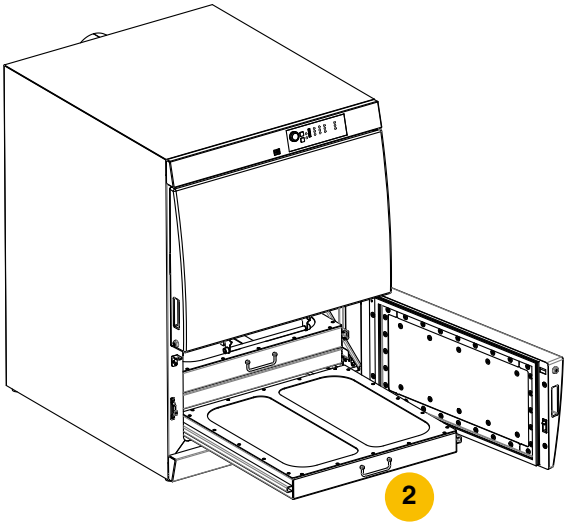
CAUTION: *The filters in the air filtration system are very heavy and must be supported properly when being removed from and loaded into the system.*

Carbon Filters

When the VOC LED on the Control Panel blinks red, the top Carbon filter is depleted. To maximize consumption of each Carbon filter, you can utilize the following rotation procedure when the top filter is exhausted.

1. In the lower chamber of the air filtration unit, move the Carbon filter lock lever to the upper position until it engages the spring-loaded hooks.
2. Remove the exhausted upper Carbon filter and dispose.
3. Inspect the rubber carbon seal used to create a seal between the upper Carbon filter and the carbon filter spacer, replace if necessary.
4. Remove the lower Carbon filter.
5. Inspect the rubber carbon seals used to create a seal between the Carbon filter and the carbon filter spacer as well as the bottom of the UAC, replace if necessary.
6. Place the Carbon filter, removed from the lower position, in the upper position (1) and slide it on the rails until it touches the back of the cabinet.
7. Position the new Carbon filter on the lower filter rails (2) and slide it until it touches the back of the cabinet.
8. Release the hooks and move the Carbon filter lock lever down until it engages into the locked position.





CAUTION: *The filters in the air filtration system are very heavy and must be supported properly when being removed from and loaded into the system.*