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User's Manual

Purifier® Axiom® Type C1 Biological Safety Cabinets

Models

30441 Series
30448 Series
30461 Series
30468 Series

To receive important product updates, complete your product registration card online at **register.labconco.com**

Please read the User's Manual before operating the equipment.

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Warranty

Labconco Corporation provides a warranty to the original buyer for the repair or replacement of parts and reasonable labor as a result of normal and proper use of the equipment with compatible chemicals. Broken glassware and maintenance items, such as filters, gaskets, light bulbs, finishes and lubrication are not warranted. Excluded from warranty are products with improper installation, erratic electrical or utility supply, unauthorized repair and products used with incompatible chemicals.

Purifier® Axiom® Biological Safety Cabinets carry a five-year warranty from date of installation or six years from date of shipment from Labconco, whichever is sooner. Warranty is non-transferable and only applies to the owner (organization) of record.

Buyer is exclusively responsible for the set-up, installation, verification, decontamination or calibration of equipment. This limited warranty covers parts and labor, but not transportation and insurance charges. If the failure is determined to be covered under this warranty, the dealer or Labconco Corporation will authorize repair or replacement of all defective parts to restore the unit to operation. Repairs may be completed by 3rd party service agents approved by Labconco Corporation. Labconco Corporation reserves the rights to limit this warranty based on a service agent's travel, working hours, the site's entry restrictions and unobstructed access to serviceable components of the product.

Under no circumstances shall Labconco Corporation be liable for indirect, consequential, or special damages of any kind. This warranty is exclusive and in lieu of all other warranties whether oral, or implied.

Returned or Damaged Goods

Do not return goods without the prior authorization from Labconco. Unauthorized returns will not be accepted. If your shipment was damaged in transit, you must file a claim directly with the freight carrier. Labconco Corporation and its dealers are not responsible for shipping damages.

The United States Interstate Commerce Commission rules require that claims be filed with the delivery carrier within fifteen (15) days of delivery.

Limitation of Liability

The disposal and/or emission of substances used in connection with this equipment may be governed by various federal, state, or local regulations. All users of this equipment are required to become familiar with any regulations that apply in the user's area concerning the dumping of waste materials in or upon water, land, or air and to comply with such regulations. Labconco Corporation is held harmless with respect to user's compliance with such regulations.

Contacting Labconco Corporation

If you have questions that are not addressed in this manual, or if you need technical assistance, contact Labconco's Customer Service Department or Labconco's Product Service Department at 1-800-821-5525 or 1-816-333-8811, between the hours of 7:30 a.m. and 5:30 p.m., Central Standard Time.

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CAUTION – See Manual. When this symbol is on the unit it indicates a caution that is detailed in this manual.

ATTENTION - Voir manuel. Lorsque ce symbole est allumé l'appareil, il indique une mise en garde qui est indiqué dans ce manuel.

Chapter 1: Introduction

Congratulations on the purchase of a Labconco® Purifier Axiom® Biosafety Cabinet. The biosafety cabinet is designed to protect you, the product and the laboratory environment from biohazardous aerosols. The Axiom is the result of years of experience in manufacturing biohazard cabinetry, and users like you suggested many of its features.

This biosafety cabinet offers many unique features to enhance safety, performance and ergonomics. To take full advantage of them, please acquaint yourself with this manual and keep it handy for future reference. If you are unfamiliar with how biosafety cabinets operate, please review *Chapter 4: Performance Features and Safety Precautions* before you begin working in the cabinet. Even if you are an experienced biosafety cabinet user, please review *Chapter 5: Using the Cabinet*; it describes the biosafety cabinet's features so that you can use it efficiently.

This manual and other technical information is available in PDF format at our website: www.labconco.com.

If the unit is not operated as specified in this manual it may impair the protection provided by the unit.

Si l'unité n'est pas utilisée comme spécifié dans ce manuel il peut diminuer la protection fournie par l'unité.

Chapter 2: Prerequisites

Before you install the Axiom, you need to prepare the site for installation. Examine the location where you intend to install the cabinet. You must be certain that the area is level and of solid construction. In addition, a dedicated source of electrical power must be located near the installation site.

Carefully read this chapter to learn:

- Location requirements.
- Electrical power requirements.
- Exhaust requirements.
- Service utility requirements.
- Space requirements.

Refer to *Appendix C: Specifications*, for complete biosafety cabinet electrical and environmental conditions, specifications and requirements.

Space Requirements

The overall dimensions for the 4-foot Axiom are 64.2 inches (163 cm) high, 32.2 inches (82 cm) deep, and 54.2 inches (138 cm) wide. The overall dimensions for the 6-foot Axiom are 64.2 inches (163 cm) high, 32.7 inches (83 cm) deep, and 78.2 inches (199 cm) wide.

Complete dimensions for the Axiom C1 biosafety cabinets are shown in *Appendix B: Dimensions*.

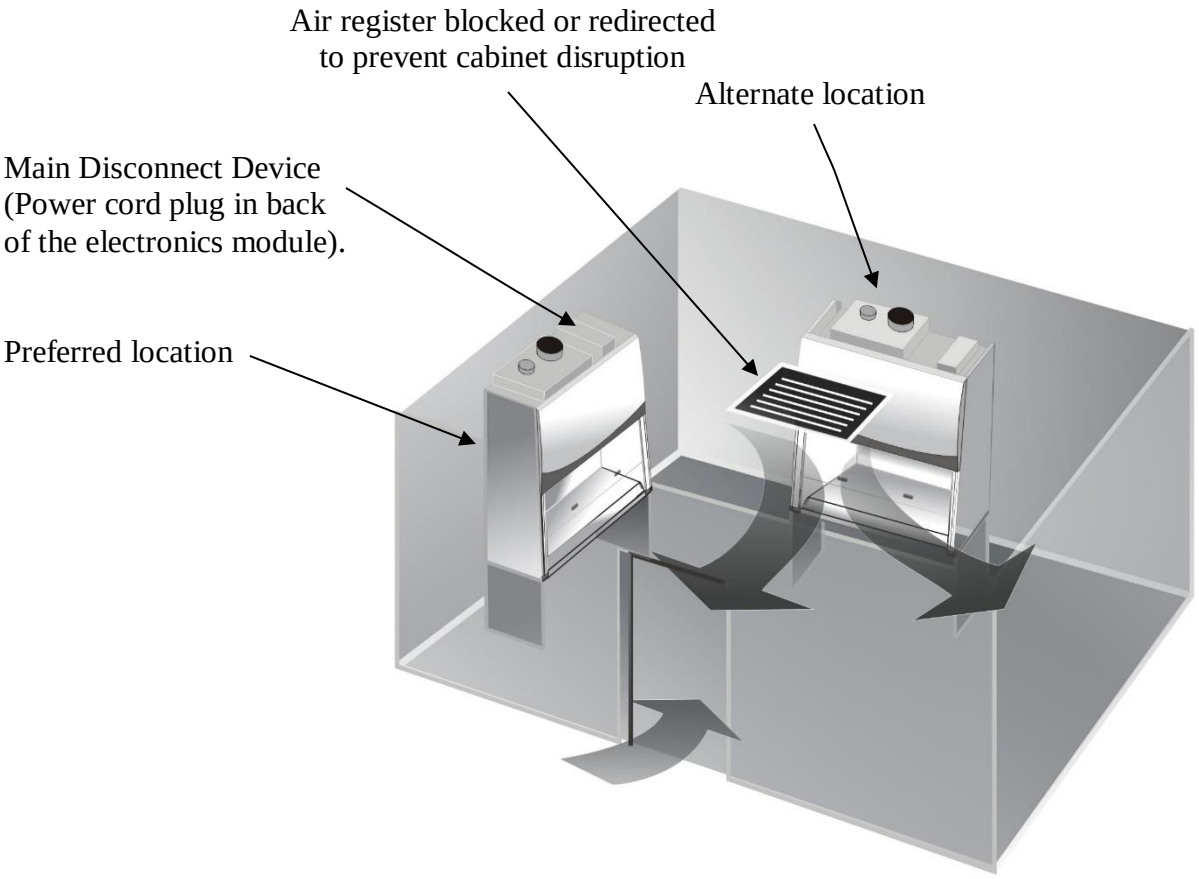
Clearance

A minimum clearance of at least 4 inches (100 mm) is suggested on the top and 6 inches (150mm) on both sides of the cabinet for service.

Location Requirements

Note: The biosafety cabinet should be located away from traffic patterns, doors, fans, ventilation registers, fume hoods and any other air-handling devices that could disrupt its airflow patterns. All windows in the room should remain closed. Figure 2-1a shows the preferred location for the biosafety cabinet.

Figure 2-1a



Do not position the unit so that it is difficult to operate the main disconnect device.

Ne placez pas l'appareil de sorte qu'il est difficile de faire fonctionner le dispositif principal de déconnexion.

If you intend to connect the biosafety cabinet to an exhaust system:

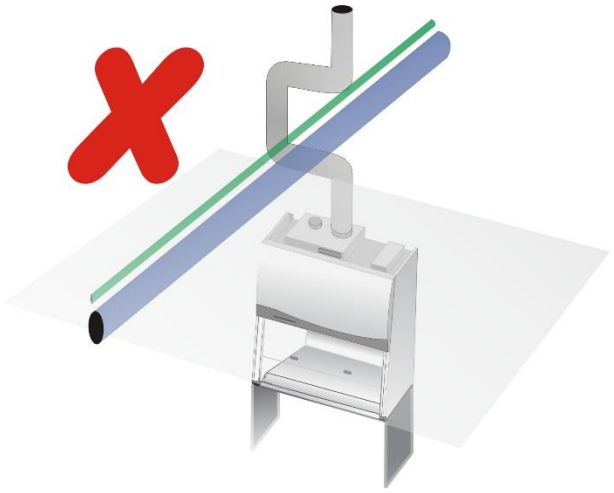
NOTE: Only connect the cabinet to a suitable exhaust system, one dedicated to the cabinet itself, or dedicated to exhausting laboratory ventilation equipment. DO NOT connect the unit to the building's HVAC system room exhaust.

Examine the location to ensure that it accommodates the cabinet's exhaust duct. The area directly above the cabinet's exhaust port should be clear of structural elements, water and utility lines, or other fixed obstructions. There should be enough clearance to accommodate a 10-inch diameter duct.

Figure 2-1b

Avoid cabinet locations that require an elbow directly above the cabinet's exhaust connection or an excessive number of elbows in the exhaust system. There should be a straight length 10 duct diameters long between the cabinet and any elbow, and between subsequent elbows.

Figure 2-1c

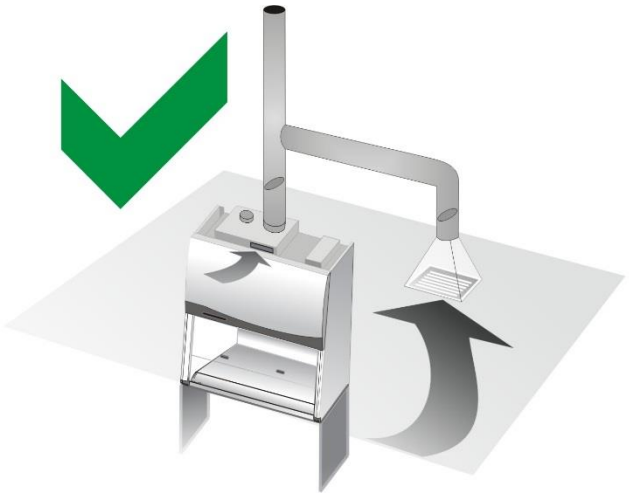


The Inlet Relief Valve located on the top of the cabinet is designed to draw a maximum of 100 CFM (2.83 m^3/m). Attempting to draw additional room air through the valve (room air exhaust), can result in unstable cabinet operation.

Figure 2-1d

Figure 2-1e

If additional room exhaust is needed to be drawn through the exhaust system, install an additional duct and balancing damper downstream of the cabinet's damper. This will allow for proper balancing of the system.



The exhaust system must be capable of moving the following volumes of exhaust air at the negative pressures listed. The **Airflow Volumes** are the values recorded via a direct measurement using a flow hood at the cabinet. The **Concurrent Balance Values** are measured in the exhaust duct via traverse methodology, and will always be higher due to differences in volume measurement methodologies.

Table 2-1

Axiom Type C1 Airflows	Airflow Volume		Concurrent Balance Value		Recommended Duct Vacuum[1]	
	ft^3/min	m^3/sec	ft^3/min	m^3/sec	WC	Pa
4-foot, 8" Sash	323	0.15	387	0.18	0.30	75
4-foot, 10" Sash	400	0.19	480	0.23	0.30	75
6-foot, 8" Sash	463	0.22	556	0.26	0.30	75
6-foot, 10" Sash	570	0.27	684	0.32	0.30	75

1 – Unlike Type B cabinets, the recommended vacuum will remain constant throughout the life of the Exhaust HEPA filter. Duct vacuums below 0.2 WC (25 Pa), or above 0.5 WC (125 PA) may result in erratic operation.

Electrical Requirements

The biosafety cabinet models have the following electrical requirements:

Table 2-1

Model #	Requirements
3044xxx0x	115 VAC, 60 Hz, 16 Amps
3044xxx2x	100 VAC, 50/60 Hz, 16 Amps
30441xx-10, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 8 Amps
3046xxx0x	115 VAC, 60 Hz, 16 Amps
3046xxx2x	100 VAC, 50/60 Hz, 16 Amps
3046xxx-10, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 8 Amps

Note: A dedicated outlet with an appropriate circuit breaker should be located as close as possible to the right rear side of the cabinet, at a height even with, or higher than, the top of the bench or stand. Models rated for 100 or 115 VAC will require a 20 Amp outlet. Consult your local electrical codes for properly rated circuit breakers. For safe operation the dedicated outlet must provide the protective earthing ground connection to the cabinet.

Note: On 100 and 115 VAC models, both electrical outlets are protected by a ground fault interrupter circuit (GFIC). Labconco does not recommend plugging the biosafety cabinet into a GFIC outlet.

Electrical outlets in the cabinet are restricted to 5 amps maximum current.

Prises électriques dans l'armoire sont limitées à 5 courant maximum ampères.

Do not use any detachable power cord that is not adequately rated for the unit.

Ne pas utliser un fil électrique amovible qui n'est pas du tension nominale de l'appareil.

Service Line Requirements

All utility service lines should be ¼ inch O.D., brass, copper, or stainless steel, and equipped with an easily accessible shut-off valve. The service valves are rated for operation at 40 PSI (275 kPa). If the service line pressure exceeds this, it must be equipped with a pressure regulator to reduce the line pressure.

Note: The use of flammable gases or solvents should be avoided in the biosafety cabinet. Open flame in the cabinet will disrupt the laminar airflow in the cabinet and may damage the HEPA filters. Flammable gases or solvents may reach explosive concentrations in the cabinet or ductwork. If you feel that the procedure requires the use of an open flame or flammable materials, contact the institution's safety office.

The use of air or gases under high pressure should be avoided as they may seriously disrupt the airflow patterns in the cabinet.

Chapter 3:
Getting Started

Now that the installation is properly prepared, you are ready to inspect, install, and certify the Axiom biosafety cabinet. This chapter covers how to:

- Unpack and move the biosafety cabinet.
- Install the cabinet.
- Connect the electrical supply source.
- Connect the service lines.
- Connect to an exhaust system (optional).
- Arrange certification of the biosafety cabinet.

Tools required for installation the biosafety cabinet include two 1/2" wrenches, a flat-blade screwdriver, a #2 Phillips screwdriver, and a carpenter's level.

Note: The biosafety cabinet models weigh between 630–900 lbs. (286-408 kg). The shipping pallet allows for lifting with a mechanical lift truck or floor jack.

Unpacking the Biosafety Cabinet

Carefully remove the outer carton and inspect the cabinet for damage that may have occurred in transit. If the biosafety cabinet is damaged, notify the delivery carrier immediately and retain the entire shipment intact for inspection by the carrier.

Note: United States Interstate Commerce Commission rules require that claims be filed with the delivery carrier within fifteen (15) days of delivery.

Do not return goods without the prior authorization of Labconco. Unauthorized returns will not be accepted.

If the cabinet was damaged in transit, you must file a claim directly with the freight carrier. Labconco Corporation and its dealers are not responsible for shipping damages.

Do not discard the carton or packing material for the biosafety cabinet until all of the components have been checked, installed and tested.

The cabinet is secured to the pallet in two places on each side. To access the nuts and bolts, remove the side panels by removing and keeping the two Phillips screws on both panels. Swing the front of each panel away from the cabinet, and lift it straight up to remove the panel from the cabinet.

Note: The side panels must be removed to access the fasteners that secure the biosafety cabinet to the pallet. **DO NOT ATTEMPT TO LIFT THE BIOSAFETY CABINET BY THE SIDE PANELS; DAMAGE WILL OCCUR.**

Moving and Lifting the Cabinet

Move the cabinet, attached to its pallet, by using a floor jack, or a furniture dolly underneath the unit. DO NOT move the cabinet by tilting it onto a hand truck. When lifting the cabinet DO NOT lift the cabinet in the middle front area of the hull. Lifting here may bend or distort the bottom of the cabinet, causing damage to the unit.

Installing the Biosafety Cabinet on an Existing Work Surface

Note: The biosafety cabinet is very top heavy. Use caution when lifting or moving it.

When installing the biosafety cabinet onto an existing work surface or benchtop, ensure that the structure can safely support the combined weight of the cabinet and any related equipment. The work surface should be at least as wide as the cabinet and 31 inches (787 mm) deep to properly support the unit. A hole or notch may be cut in the supporting surface in the right front corner to accommodate the optional drain valve.

Installing the Cabinet on a Labconco Base Stand

Labconco offers accessory Base Stands in a variety of configurations to suit your particular needs. Stands can be ordered with adjustable telescoping legs or with a manually or electrically adjustable hydraulic lift.

Telescoping Base Stands

These stands are included with some Axiom models, or are available separately. The base stands for each width cabinet are listed in Table 3-1 below. An optional caster wheel kit is available (part # 3730500).

Table 3-1

Width	Base Stand w/Feet Model #
4'	3401004
6'	3401006

Manual or Electric Hydraulic Lift Base Stands

These base stands offer infinitely adjustable height between 25.5 and 33.5 inches (648 to 851 mm), giving a cabinet work surface height of 28.0 to 36.0 inches. The height is adjusted either by a manual (hand crank) or electric pump that drives the hydraulic legs of the stands. All of the hydraulic stands are equipped with fixed feet, but can be converted to caster wheels with the addition of Caster Kit #3784000. The base stands for each cabinet size is listed in Table 3-2 below.

Table 3-2

Width	Manual Lift Stand #	Electric (115V) Lift Stand #	Electric (230V) Lift Stand #
4'	3780201	3780101	3780104
6'	3780202	3780102	3780105

Note: When installing the cabinet on the hydraulic lift base stand, ensure that the hydraulic lines and the electrical cord are clear of any obstructions before installing the cabinet on the stand or operating the lift system.

SoLo™ Electric Hydraulic Lift Base Stands

These base stands permit the Axiom to be lowered enough to be transferred through a standard doorway as low as 84 inches. Casters provide mobility and lock in place. The SoLo Stands for each Purifier Axiom series model is listed below.

Table 3-3

	115V SoLo Stand	230V SoLo No. America Plug	230V SoLo UK Plug	230V SoLo Schuko Plug	230V SoLo China/ Australia Plug
4'	3780311	3780315	3780331	3780335	3780339
6'	3780313	3780317	3780333	3780337	3780341

Preparing the Biosafety Cabinet for Operation

Installation instructions (Labconco P/N 1056801) are attached to the sash of the biosafety cabinet. If these instructions are missing or unclear, contact Product Service at 800-821-5525 or 816-333-8811. The following are located in a box either underneath or secured to the work surface:

- User's Manual CD
- Drain Valve Assembly and fasteners
- Power Cord
- Product Registration Card
- Vacu-Pass™ Accessories (optional)

If you did not receive one or more of the components listed for the cabinet, or if any of the components are damaged, contact Labconco Corporation immediately for further instructions.

Connecting the Biosafety Cabinet to Utility Service Lines

Note: Some models have a solenoid valve connected to the service valve on the right side, rear position. The solenoid prevents gas from flowing to the service valve when the unit blower is off. It is the only service valve position that can be fitted with a solenoid valve. Connect the gas service to the solenoid valve.

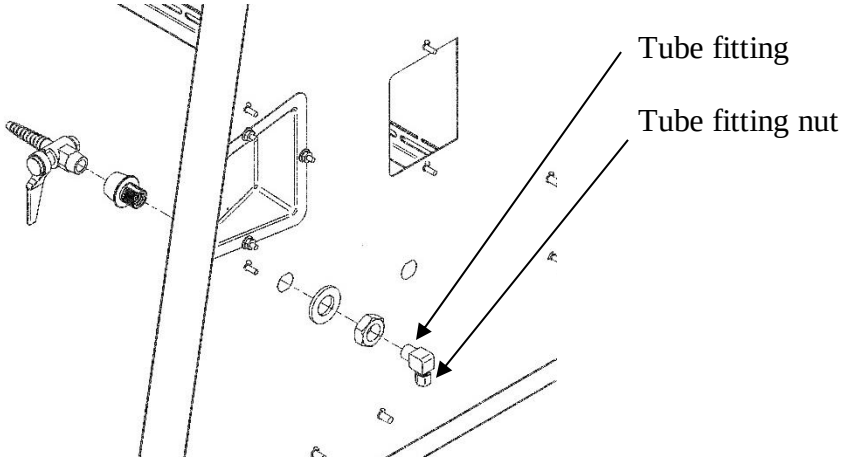
The service lines (if any) should be connected to the tube fitting(s) on the outside of the liner wall as shown in Figure 3-1. To install the tubing, follow these steps:

1. Ensure that the tubing is ¼ inch O.D., soft metal, and that the end has been completely deburred.
2. Route the tubing from the rear of the cabinet, ensuring that it will line up with the slot in the back of the side panel. The slot is located from 8 ¾ to 11 ¼ inches (222 to 288 mm) from the bottom of the cabinet.

Note: Make sure that the tube routing will not contact any electrical wires. DO NOT loop service line tubing within the side panels of the cabinet.

3. Make sure that the nut on the tube fitting is loose, but do not remove it. Look inside the fitting to make sure the tube ferrule is there.
4. Push the tube into the fitting until it is properly seated. The tube will go approximately ¾ inch (19 mm) into the fitting.
5. Tighten the tube fitting nut hand tight and then, using a 7/16-inch wrench, tighten it at least ¾ turn more.
6. Close the service valve in the biosafety cabinet and then slowly open the shutoff valve on the service valve. Test all fittings for leakage. Tighten the tube nut slightly if needed.

Figure 3-1



Optional Exhaust Connection Requirements

Certain applications such as working with odorous products or volatile toxic materials will require the connection of the biosafety cabinet to an exhaust system.

Note: The Axiom exhaust connection includes an integral inlet relief valve, which functions as a one-way, or check valve. During operation, the exhaust system draws all of the cabinet's exhaust air, plus a volume of room air through the relief valve into the exhaust duct. The inlet relief valve functions as a "shock absorber" allowing the cabinet to maintain optimal inflow during changes in room air pressure.

Note: Because the Axiom cabinet has an integral exhaust fan, the vacuum requirements of the exhaust system will be much lower than existing Type B units. Please see the volume and vacuum requirements in Table 2-1, in *If you intend to connect the biosafety cabinet to an exhaust system:* in *Chapter 2: Prerequisites*

Note: If the research involves the use of toxic compounds or volatile materials, contact the facility's safety officer or Labconco to ensure that the biosafety cabinet and its exhaust system are compatible with the materials you will be working with.

Exhaust Connection Configuration

Note: The Axiom is configured at the factory to operate *unconnected* to an exhaust system. When operating in this mode, the cabinet ignores the inlet relief valve position. **If you intend to connect the cabinet to an exhaust system, YOU MUST RECONFIGURE IT FOR THIS INSTALLATION.**

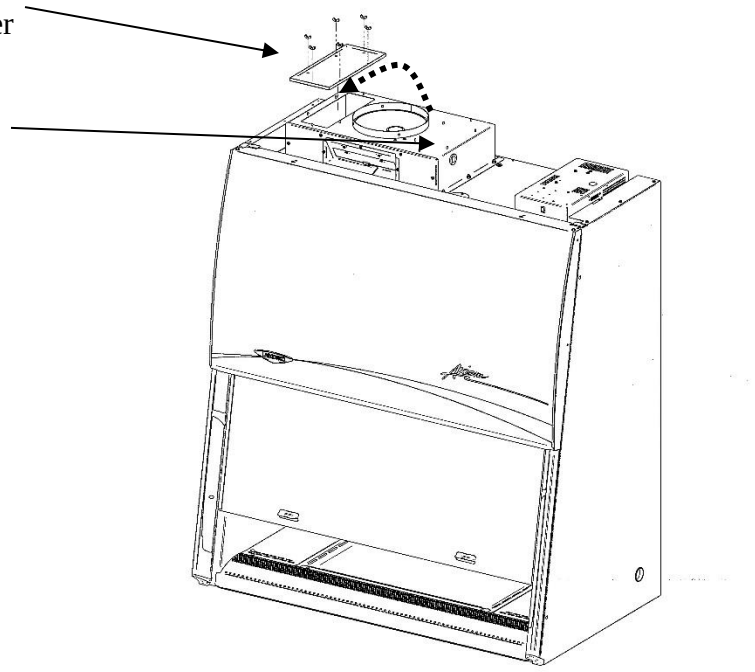
Note: If the Axiom is connected to an exhaust system, and you choose to disconnect it, to exhaust its HEPA-filtered air back into the laboratory, **YOU MUST RECONFIGURE IT FOR THIS INSTALLATION. These instructions follow.**

Connecting the Axiom to an Exhaust System

a) Mechanical configuration

1. Using an appropriate ladder or platform, remove the exhaust cover panel(s) on the top right side of the exhaust cover, and install them over the hole(s) on the left side. Hand tighten the wing nuts to secure it, as shown in figure 3-2.
2. Connect the Axiom's connection collar to the exhaust system, ensuring the connection meets all appropriate codes and regulations.

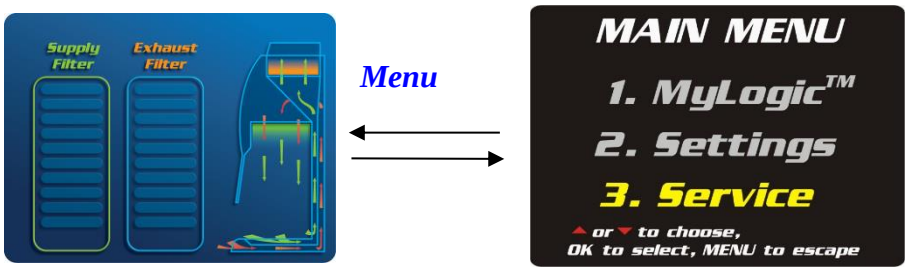
Figure 3-2



b) Electronic configuration

Keypad operations are shown as ***blue bold italic***. Menu screen selections are shown as *green italics*.

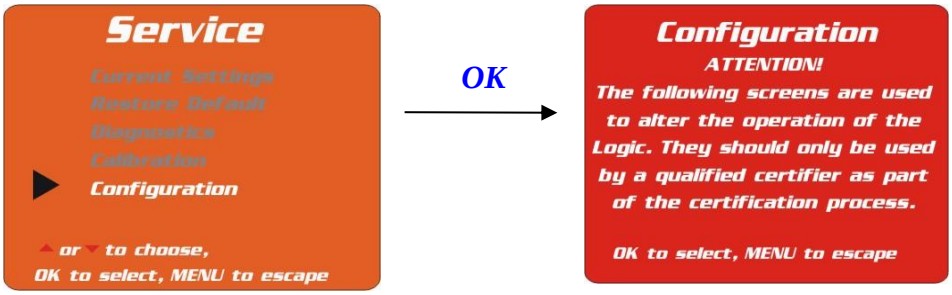
1. With the unit in operation, access the menu by pressing the ***Menu*** button. The display panel will show the first level menu. Select *Service* menu by pressing the ▲ or ▼ buttons until the *Service* is highlighted. Press ***OK*** to accept that option, or press ***Menu*** to return to the previous menu level.



Display Mode Menu Mode

Selecting the Configuration Menu

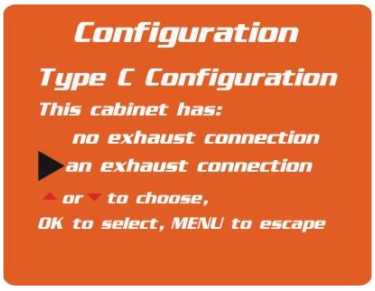
2. Using the ▲ and ▼ buttons on the touchpad, highlight the *Configuration* option-it will be highlighted when selected. Press ***OK*** and you will get an Attention screen, advising you the following screens may alter the operation of the Axiom. Press ***OK*** to continue:



3. The screen will now prompt you for the password; it is:
   Light
   UV Light
   Timer
   Timer
   OK

Note: Any other key sequence will return you to the Attention screen.

4. The first screen allows you to select whether the Axiom is connected to an exhaust system or not. **IT IS CRITICAL THAT THE *THIS CABINET HAS AN EXHAUST CONNECTION* OPTION IS SELECTED**. Press ***OK*** to continue.



5. The second screen allows you to set how long the blowers in the Axiom will continue to operate in the event of an exhaust system failure. The interval can be programmed from 0-300 seconds.

Note: Consult with your facility's safety officer or Labconco to help establish how long the Axiom should continue to operate after an exhaust system failure.

6. The third screen allows you to set the sash height at either 8 or 10 inches. **IT IS CRITICAL THAT THE YOU LEAVE THE SASH HEIGHT AS IT WAS SET AT THE FACTORY, UNLESS YOU WISH TO RECERTIFY THE CABINET AT ITS NEW SETTING**.

7. The fourth screen allows you to select whether the Axiom has a UV light or not. **IT IS CRITICAL THAT THE YOU LEAVE THE UV LIGHT CONFIGURATION AS IT WAS SET AT THE FACTORY**. Press ***OK*** to return to the first Configuration screen.

The unit is now properly configured for operation connected to an exhaust system. In this mode, the unit will display an exhaust alarm if the inlet relief valve closes during operation.

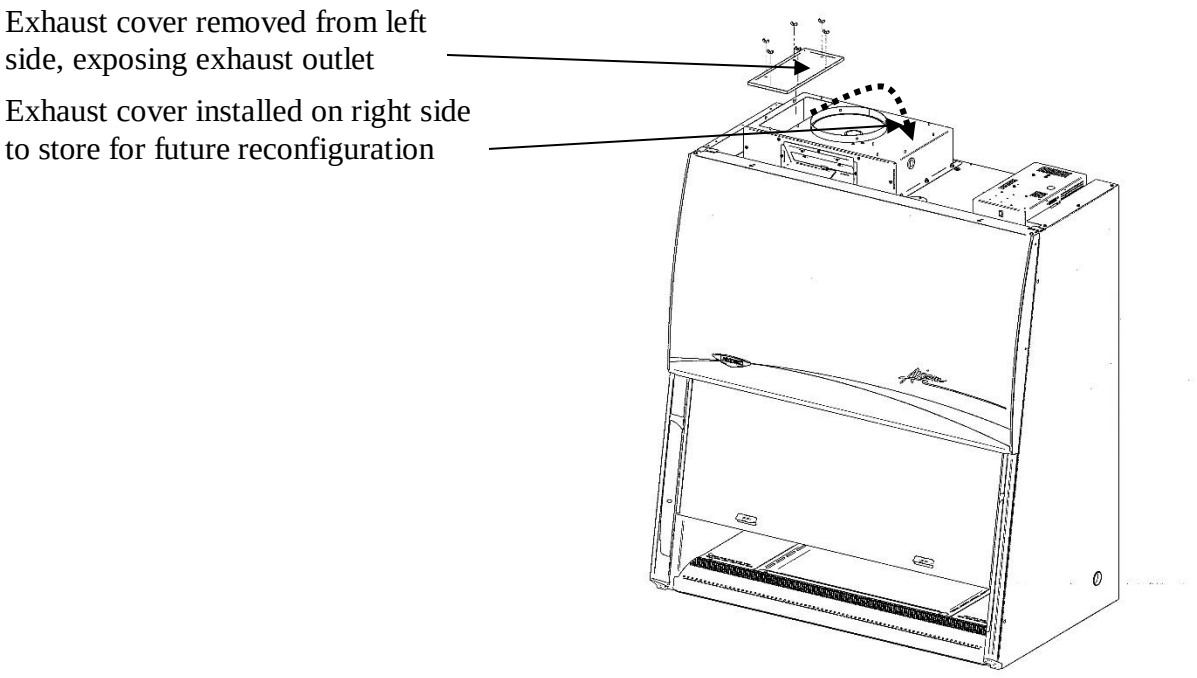
NOTE: If you ever want to disconnect the Axiom from the exhaust system, and use it in a recirculating mode, you must reconfigure it as such.

Disconnecting the Axiom from an Exhaust System

c) Mechanical configuration

1. Using an appropriate ladder or platform, remove the exhaust cover panel(s) on the top left side of the exhaust cover, and install them on the studs on the right side. Hand tighten the wing nuts to secure it, as shown in figure 3-2a.
2. Disconnect the Axiom's exhaust collar from the exhaust system, and cap the building's exhaust connection in a way that meets all appropriate codes and regulations. Leave the Axiom's exhaust collar open to allow for unrestricted airflow out of the unit.

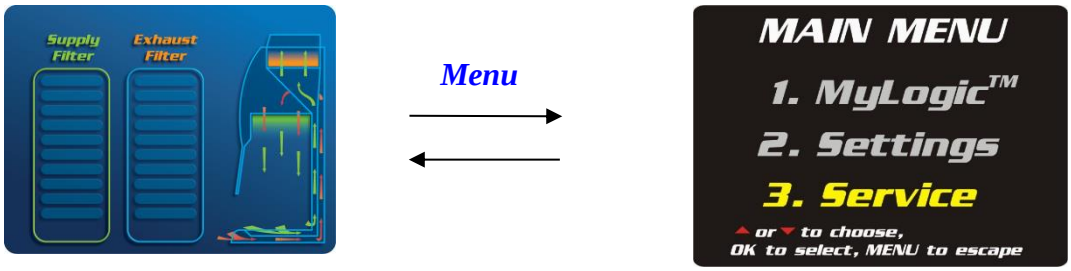
Figure 3-2a



d) Electronic configuration

Keypad operations are shown as ***blue bold italic***. Menu screen selections are shown as *green italics*.

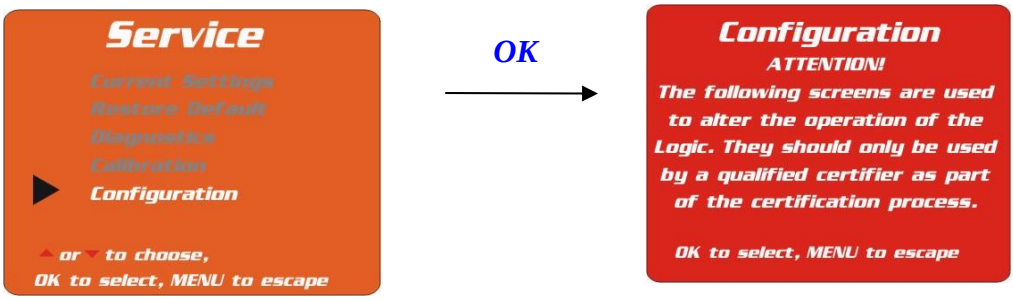
1. With the unit in operation, access the menu by pressing the ***Menu*** button. The display panel will show the first level menu. Select *Service* menu by pressing the ▲ or ▼ buttons until the *Service* is highlighted. Press ***OK*** to accept that option, or press ***Menu*** to return to the previous menu level.



Display Mode Menu Mode

Selecting the Configuration Menu

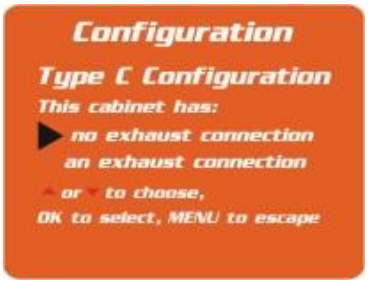
2. Using the ▲ and ▼ buttons on the touchpad, highlight the *Configuration* option-it will be highlighted when selected. Press ***OK*** and you will get an Attention screen, advising you the following screens may alter the operation of the Axiom. Press ***OK*** to continue:



3. The screen will now prompt you for the password; it is:
   Light
   UV Light
   Timer
   Timer
   OK

Note: Any other key sequence will return you to the Attention screen.

4. The first screen allows you to select whether the Axiom is connected to an exhaust system or not. **IT IS CRITICAL THAT THE *THIS CABINET HAS NO EXHAUST CONNECTION* OPTION IS SELECTED**. Press ***OK*** to continue.



5. The third screen allows you to set the sash height at either 8 or 10 inches. **IT IS CRITICAL THAT THE YOU LEAVE THE SASH HEIGHT AS IT WAS SET AT THE FACTORY, UNLESS YOU WISH TO RECERTIFY THE CABINET AT ITS NEW SETTING**.

6. The fourth screen allows you to select whether the Axiom has a UV light or not. **IT IS CRITICAL THAT THE YOU LEAVE THE UV LIGHT CONFIGURATION AS IT WAS SET AT THE FACTORY**. Press ***OK*** to return to the first Configuration screen.

The unit is now properly configured for operation connected to an exhaust system. In this mode, the unit will display an exhaust alarm if the inlet relief valve closes during operation.

NOTE: If you ever want to disconnect the Axiom from the exhaust system, and use it in a recirculating mode, you must reconfigure it as such.

Optional Vacu-Pass™ Cord & Cable Portal Use

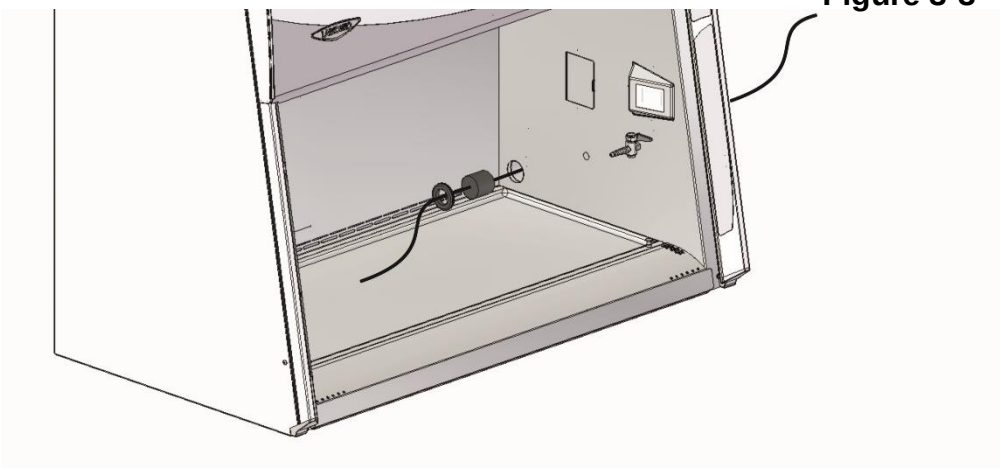
Note: There must be enough clearance to pass the cord or cable between the Axiom's exterior dress panel and any obstruction.

Note: Some Vacu-Pass components and the cord or cable passing through it may become contaminated during use of the cabinet. Ensure all potentially contaminated components are surface decontaminated before handling or removal from the cabinet.

1. Remove the grommet from the liner side wall. Remove the solid sealing plug from the body of the portal by either pressing it through from the outside, or by carefully inserting a spatula or similar device between the sealing plug and the body of the portal, and prying the plug out.
2. Pass the cord or cable through the body of the portal, and then through one of the plugs that has been cut for cord or cable use, then through the grommet, as shown in Figure 3-3.

Note: select a plug with a hole that is slightly smaller than the cord or cable, to create a proper seal. This will also help minimize movement of the cord or cable if it is accidentally pulled during use.

Figure 3-3



3. Position the cord or cable as it will be used in the cabinet, and then push the plug back into the body of the portal until it seats in the portal. Reinstall the grommet.

Drain Valve Installation

In order to prevent damage during shipping, the drain valve assembly has not been installed. If desired, the valve should be installed after the cabinet is in its final location.

To install the valve assembly, follow these steps:

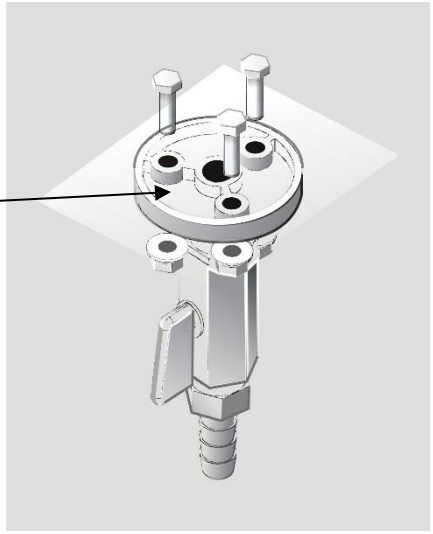
Note: The work surface is heavy. Use caution when handling it.

4. Lift the work surface out of the biosafety cabinet by lifting on the knobs at the front of the work surface. Steady the work surface while pulling it straight out the front of the cabinet.
5. Using a putty knife, remove and discard the stainless steel cover that is sealed over the drain mounting holes. Scrape out remaining sealant that is around the holes.
6. Apply a light coating of silicone sealant (user supplied) to the mounting surface of the drain assembly. Attach the drain assembly under the bottom of the cabinet as shown in Figure 3-4. Wipe off any excess sealant from the cabinet bottom. Ensure that the center drain hole is unobstructed.
7. Make sure the drain valve is in the closed position.
8. Reinstall the work surface.
9. Allow the silicone sealant to cure for at least eight hours before exposing it to liquid.

Figure 3-4

NOTE: The drain valve assembly attaches to the underside of the cabinet bottom.

Apply a light coat of silicone sealant to this surface of the connector, aligning the three holes in the connector with the three holes in the biosafety cabinet liner.



Initial Certification

Prior to use, a qualified certifier should certify all biosafety cabinets. Under normal operating conditions, the biosafety cabinet should be recertified at least annually and when relocated or serviced. The certifier should perform the following tests, as recommended in NSF International/ANSI Standard Number 49 in effect when the cabinet was manufactured:

- Downflow Velocity Profile Test
- Inflow Velocity Test
- Airflow Smoke Patterns
- HEPA Filter Leak Test
- Inlet Relief Valve/Exhaust Alarm Test and Operation
- Vibration Test *
- Noise Level Test *
- Lighting Intensity Test *

*These tests are user comfort related tests and may be omitted at the user's or certifier's discretion.

If you have any questions regarding certification agencies or need assistance in locating one, contact Labconco's Product Service Department at 1-800-522-7658 or 816-333-8811.

Chapter 4: Performance Features and Safety Precautions

The Type C1 Purifier Axiom Biosafety Cabinet operates using the following principles:

- Filtration and retention of particulates by High Efficiency Particulate Air (HEPA) filter(s)
- Laminar airflow
- Directional airflow
- The Chem-Zone™ directly exhausted work zone

The major components in a biosafety cabinet are:

- The HEPA filter(s) or optional ULPA filters
- The motor/blowers to force air through the cabinet
- Cabinet air intakes (grilles), ductwork and air balance controls

HEPA Filters

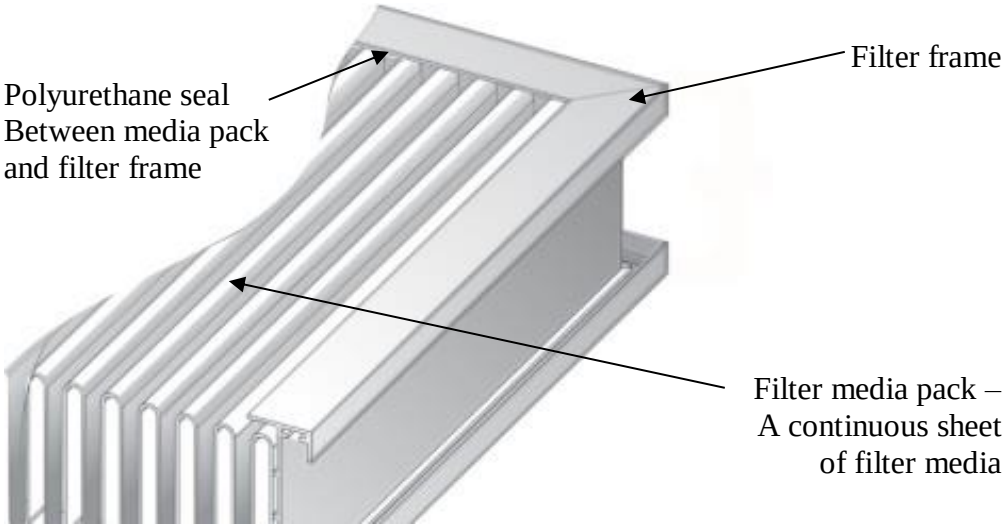
HEPA filters are disposable, dry-type particulate filters. The filter material or media is typically made of borosilicate microfibers formed into a thin sheet, in a process similar to the production of paper. This sheet is folded, or pleated to increase its surface area. The pleats are typically held in place by beads of glue that add rigidity to the media pack. The pack is then set into a frame, and sealed as shown in Figure 4-1.

The HEPA filter manufacturer establishes the efficiency of the filter by challenging it with an aerosol of known particle size. The number of particles that penetrate the filter are quantified, and this establishes the efficiency of the filter. Thus, the filters used in the Axiom cabinets are at least 99.99% efficient in removing particles 0.3 micron.

Note: The HEPA filter media is very fragile. DO NOT touch the media. If you think the media of a HEPA filter is damaged, DO NOT USE THE CABINET. Have the HEPA filter integrity tested by a certifier before using the cabinet.

Note: HEPA Filters are only effective against particulate material. Gases and vapors will pass through the filter.

Figure 4-1



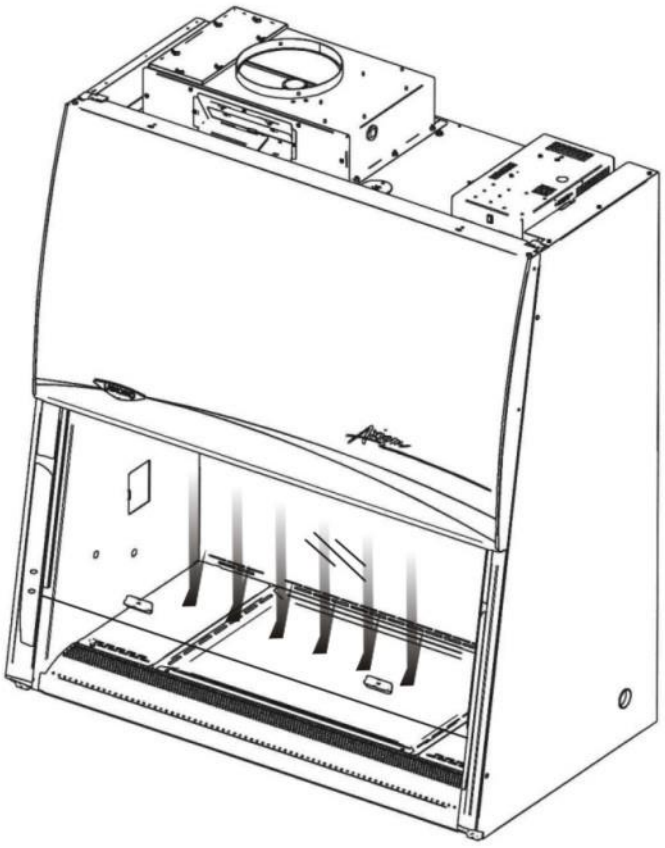
ULPA Filters

Optional ULPA filters may be used to replace the standard HEPA filters in the Purifier Axiom biosafety cabinets. ULPA filters have the same properties as described above except they are rated at least 99.999% efficient in removing particles 0.1-0.2 or 0.2-0.3 micron.

Laminar Airflow

Laminar airflow is defined as the movement of a body of air in a single direction, with a uniform velocity. In practice, the laminar downflow of air in the cabinet captures any aerosol generated in the work area of the cabinet, and directs it to the HEPA filters. In order to be true laminar downflow, a number of individual downflow velocity test points (The Downflow Velocity Profile) must be +/- 16 feet per minute (0.08 m/s) of the average of all the test points. This is illustrated in Figure 4-2.

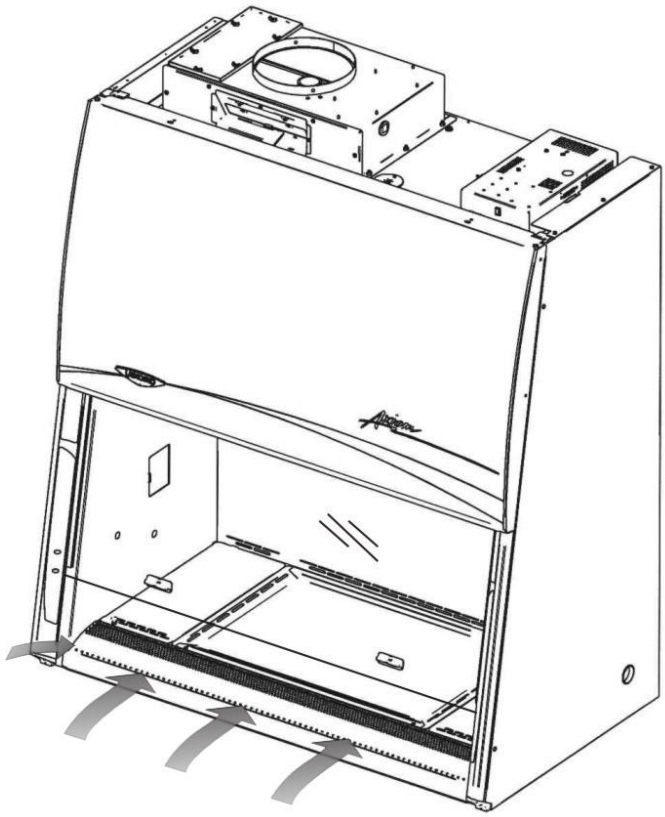
Figure 4-2



Directional Airflow

Directional airflow also plays a key role in biosafety cabinet performance. Air is drawn into the front of the cabinet at the front grille. This “curtain” of air makes it more difficult for aerosols to escape out of the work area of the cabinet and into the outside environment. This airflow is often calculated and referred to as the **Inflow Volume** or **Average Inflow Velocity**. This is illustrated in Figure 4-3.

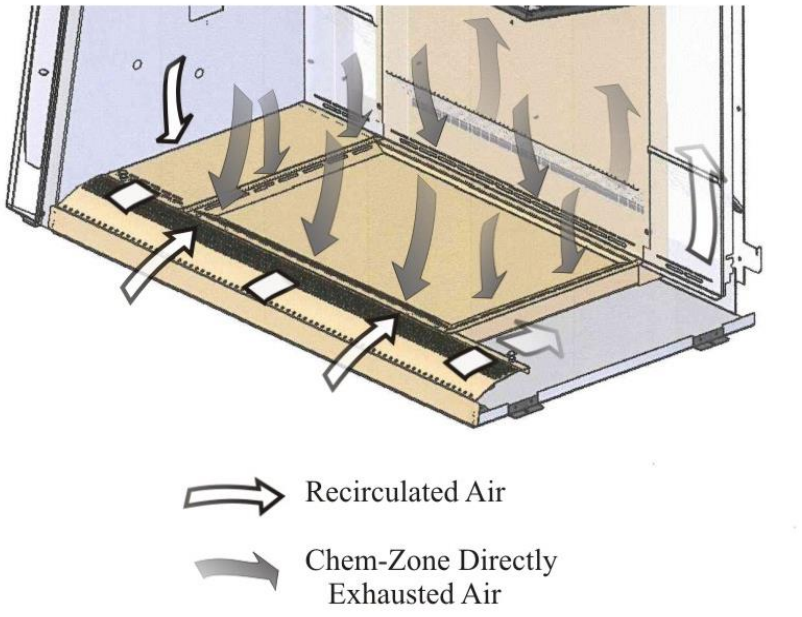
Figure 4-3



Chem-Zone™ Directly Exhausted Work Zone

Unique to the Axiom is the Chem-Zone, a directly exhausted work zone. The central portion of the work surface is surrounded by grilles on the sides, front and back. Air entering these grilles is drawn to the Exhaust HEPA filter, and when the cabinet is connected to an exhaust system, out of the laboratory. This feature prevents the recirculation of volatile chemicals as seen in Type A cabinets, while exhausting much less air than Type B2 models. This is illustrated in Figure 4-4.

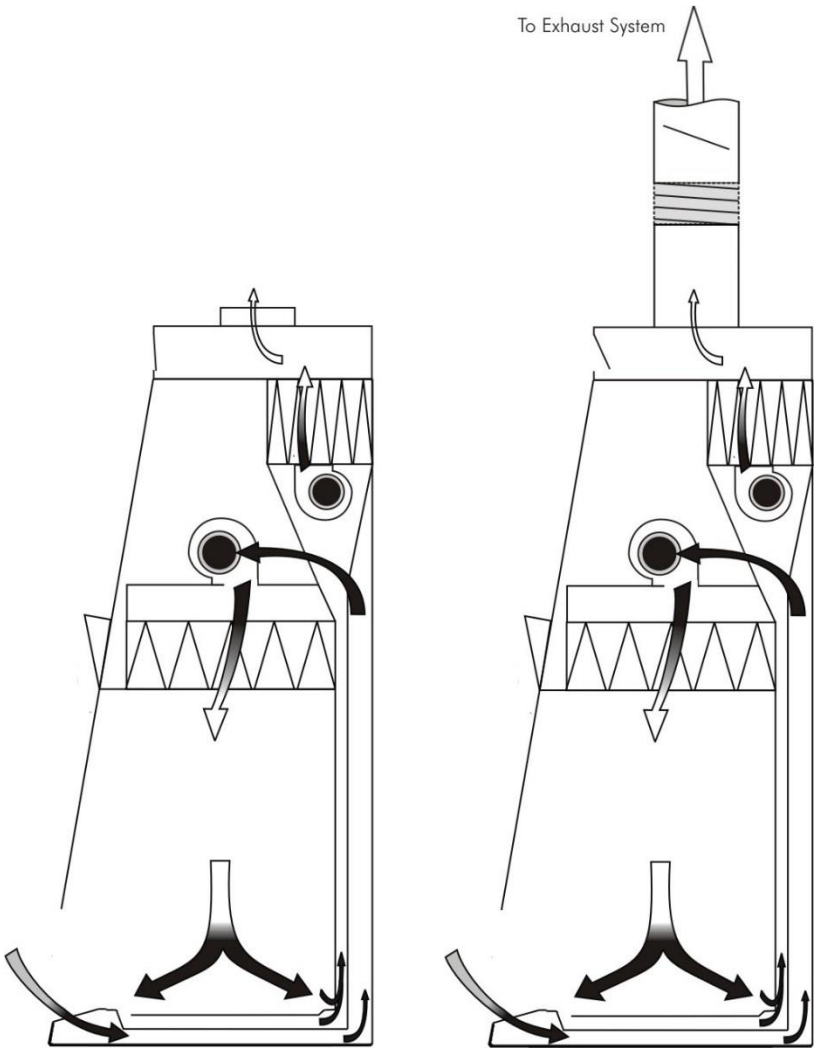
Figure 4-4



Motor/Blowers

Unlike most Biosafety Cabinets, the Axiom has two motor/blowers. The supply motor/blower is positioned above the Supply HEPA filter, and is responsible for the recirculation of air from the front grille and sides of the work area back down through the work area. The exhaust motor/blower is located before the exhaust HEPA filter, and it draws the air in the center of the work area, and pushes it through the filter, discharging HEPA-filtered air either back into the laboratory, or into an exhaust system. As shown in Figure 4-5. Both motors in the Axiom cabinet are electronically commutated motors (ECM). The ECM is a brushless DC motor that includes its own power supply to convert the incoming alternating current to direct current, as well as its own microprocessor to control and measure the motor's operation. The motors utilize Labconco's exclusive Constant Airflow Profile™ (CAP) programming to deliver a consistent volume of air, throughout the life of the HEPA filters.

Figure 4-5



Cabinet Air Intakes (Grilles)

The location, size, and pattern of the grilles in the work area affect cabinet containment and performance.

Note: Do not block or obstruct the grilles of the biosafety cabinet.

Ultraviolet (UV) Lamp

The optional UV lamp generates a primary wavelength of light of 254nm. A secondary emission is in the visible (blue) wavelength, resulting in the characteristic blue color while operating. UV light at this wavelength is biocidal, primarily by creating thymine dimers in DNA. These dimers prevent the correct transcription of the DNA into RNA, resulting in cellular death or viral inactivation. In order to be effective, the UV light must directly strike the nucleic acid, and its effectiveness can be diminished or negated by dissolved proteins or metals, or by other UV-opaque substances protecting the target nucleic acid.

Because of its limitations, UV light should be used as an adjunct to good surface disinfection practices. In order to get optimum performance from the UV light, it should be replaced after 6,000 hours of operation or less, and the exterior surface of the lamp should be kept clean and free of dust.

Note: The Axiom records the number of hours of operation of the UV light. You can program in the number of hours (in 100-hour increments) it will operate before a replacement message is displayed.

Note: UV irradiation is absorbed by the tempered safety glass of the sash. Independent research has shown that the level of UV irradiation on the outside of the cabinet's sash is equal to background radiation levels.

Note: The UV sensitivity of a target organism varies, depending on the UV output of the lamp, the genus and species of the organism, the medium the agent is suspended in, etc. Contact the Health and Safety Officer at your facility for UV light use and recommendations.

Safety Precautions

Note: The biosafety cabinet should be certified by a certification technician before its initial use. The cabinet should be recertified whenever it is relocated, serviced or at least annually thereafter. Filter integrity and airflow performance should be verified before using the cabinet.

Some internal components of the biosafety cabinet may become contaminated during operation of the unit. Only experienced personnel competent in decontamination procedures should decontaminate the cabinet before servicing these components. If you have any questions regarding certification agencies, or need assistance in locating one, contact Labconco's Product Service Department at 800-821-5525 or 816-333-8811.

If your work involves volatile toxic chemicals or radionuclides, ensure that the Type C1 is connected to an operational exhaust system, and is properly configured. Keep these materials in the center work area, so that any air flowing over these materials will be directed to the exhaust HEPA filter and out of the lab.

DO NOT load more than 50 lbs. (23 Kg) in the work area. Exceeding this limit may damage the work surface and its supports. Excessive weight in the cabinet may increase the risk of it overturning, or failure of hydraulic lift stands, resulting in the cabinet and stand overturning. If your application requires loading more than 50 lbs., contact Labconco's Product Service Department at 800-821-5525 or 816-333-8811 for assistance.

Ensure that the cabinet is connected to electrical service in accordance with local and national electrical codes. Failure to do so may create a fire or electrical hazard. Do not remove or service any electrical components without first disconnecting the biosafety cabinet from electrical service.

Avoid the use of flammable gases or solvents in the biosafety cabinet. Care must be taken to ensure against the concentration of flammable or explosive gases or vapors. An open flame should NOT be used in the biosafety cabinet. Open flames will disrupt airflow patterns, burn the HEPA filter and/or damage the filter's adhesive. Gases under high pressure should not be used in the biosafety cabinet, as they may disrupt its airflow patterns.

HEPA filters only remove particulate matter. Operations generating volatile toxic chemicals or radionuclides must be evaluated carefully.

The media of HEPA filters is fragile and should not be touched. Avoid puncturing either HEPA filter during installation or normal operation. If you suspect that a HEPA filter has been damaged, DO NOT use the cabinet; contact a local certification agency or Labconco at 800-821-5525 or 816-333-8811 for re-certification information.

The HEPA filters in the biosafety cabinet will gradually accumulate airborne particulate matter from the room and from work performed in the cabinet. The rate of accumulation will depend upon the cleanliness of the room air,

operating time and the nature of work being done in the cabinet. The Filter Gauge accurately displays the amount of filter life remaining.

Proper operation of the cabinet depends largely upon its location and the operator's work habits. Consult the Installation and Normal Operation sections of this manual for further details.

Avoid direct exposure of plastic or coated materials to ultraviolet (UV) radiation. Never bypass the UV safety interlock that only allows the UV light to work when the sash is closed. When surface disinfecting the biosafety cabinet:

- Avoid splashing the disinfecting solution on skin or clothing.
- Ensure adequate ventilation.
- Carefully follow the disinfectant's safety instructions.
- Always dispose of disinfecting solutions in accordance with local and national laws.
- DO NOT allow disinfectants with high concentrations of free chlorine to contact the stainless steel components of the biosafety cabinet for a long period of time. Free chlorine will corrode stainless steel after extended contact.

Biosafety cabinets should be decontaminated for any of the following reasons:

- Before maintenance work requiring entry into contaminated areas.
- Before HEPA filter changes.
- Before performing certification tests requiring entry into contaminated areas.
- Before relocating the cabinet.
- Before changing research programs.
- After the gross spill of biohazardous material or toxic chemicals.

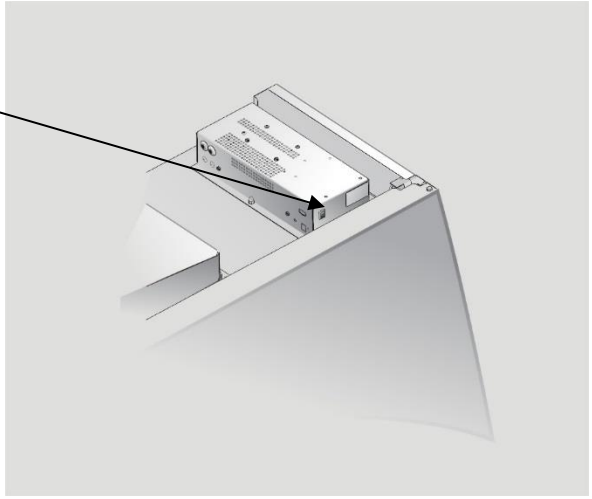
Chapter 5:
Using the Cabinet

System Reset Switch

The biosafety cabinet has a system reset switch for resetting its microprocessors. The switch is located on the front of the electronics module, on top of the cabinet, as shown in Figure 5-1. Ensure that the switch is in the "ON" (up) position before attempting to operate the cabinet.

Figure 5-1

The System Reset Switch



Blower Startup Sequence

To ensure proper protection, during blower startup, the Axiom will always start its exhaust blower first. When the exhaust blower reaches an appropriate speed, then the supply blower will start.

In the event of an exhaust fan failure, the Axiom will initiate an exhaust fan alarm.

During blower shut down, the supply blower will stop first, followed by the exhaust blower approximately 10 seconds later. This will ensure proper containment within the Axiom until all blower operation ceases.

Information Center

The Information Center is an LCD display located on the right side wall at eye level. When the blower is started, if the Axiom is configured to be connected to an exhaust system, Figure 5-2a will appear for 60 seconds while the unit initiates operation.

If the unit is not connected to an exhaust system, screen 5-2b will appear for the first 60 seconds of operation. After 60 seconds, the default display screen will appear. The display provides a clock, the life remaining for both filters, the cabinet's current status, inflow velocities (if equipped with the optional airflow sensor), as shown in Figure 5-3. In the event of an alarm, the Information Center will immediately display a context sensitive display indicating the cause of the alarm, and possible solutions, as shown in Figure 5-4.

The display will enter sleep mode, turning itself off, one minute after the blower is turned off or the sash is closed.

Figure 5-2a

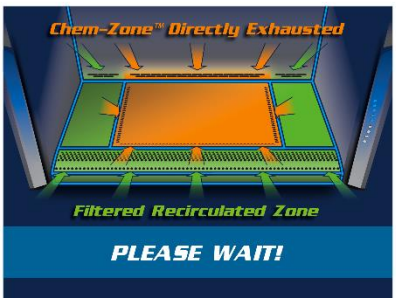
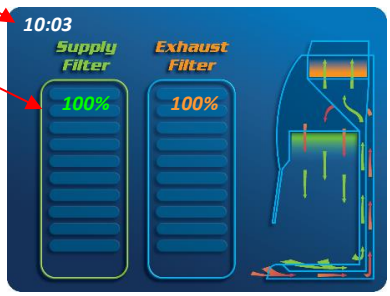


Figure 5-2b

Clock

Filter Life

Figure 5-3



Alarm Screens

Figure 5-4a

Sash is too high

The sash is open too far for safe operation.

Figure 5-4b

Airflow Alerts

The airflow patterns in the cabinet have changed, resulting in a sudden change in either motor speed. This is most likely due to a blockage of the grille or the exhaust filter outlet. It may also be caused by removal of the work surface while the cabinet is in operation.

Figure 5-4c

Exhaust Fan Alarm

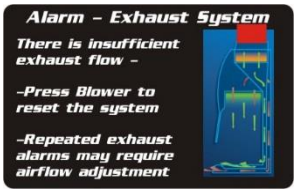
There has been a failure of the exhaust fan, or its communication to the cabinet's control board. DO NOT USE THE CABINET UNTIL THE PROBLEM HAS BEEN CORRECTED.

Figure 5-4d

Exhaust System Alarm-Active Protection Mode

When connected to an exhaust system, and the flow drops below acceptable limits, this screen will appear. When the timer reaches 0, the supply blower will shut off, and the exhaust fan will continue to operate for 10 more seconds, protecting the operator, until the countdown reaches 0.

Figure 5-4e



Exhaust System Alarm

After the countdown reaches 0, the exhaust fan will shut off and this screen will be displayed. If this alarm is displayed, the Axiom blower will need to be turned off, and then back on again to reset the alarm. Frequent Exhaust System Alarms indicate unstable or insufficient exhaust flow, and must be corrected.

Figure 5-4f

System Error

The motor and display circuit board are not communicating properly. DO NOT USE THE CABINET UNTIL THE PROBLEM HAS BEEN CORRECTED.

Operating the Sliding Sash

The counterbalanced, anti-racking sash mechanism requires only a few pounds of force to move the sash up or down. You can open or close the sash smoothly with one or two hands positioned on either handle.

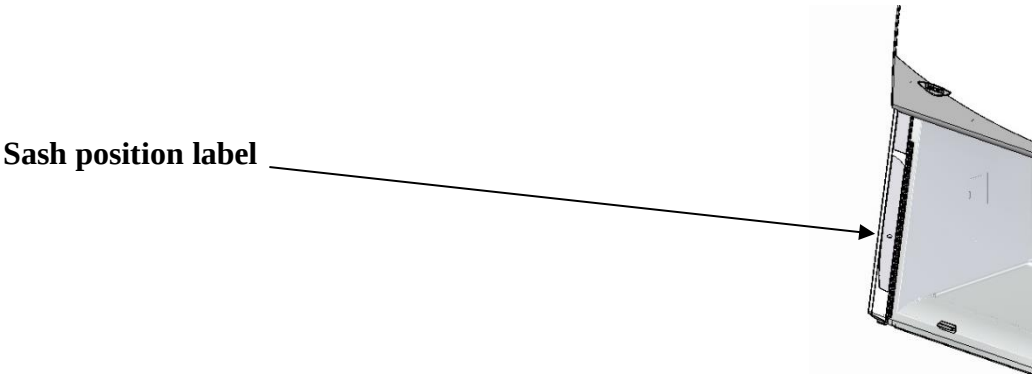
The sash position alarm and safety interlock system senses the sash position and acts appropriately. The biosafety cabinet has been programmed to operate at either an 8- or 10-inch (203-254 mm) sash opening, depending on model. Raising the sash above its operating height will activate the audible and visual alarms. The audible alarm can be temporarily muted (for approximately five minutes) by depressing and releasing the ***OK/Mute*** button. Closing the sash back to its operating position will reset the alarm and defeat the muting of the alarm. The safety interlock system senses when the sash is closed and allows the optional ultraviolet (UV) lamp to operate only when the sash is closed, to protect the operator from irradiation.

Starting the Biosafety Cabinet

1. To start the biosafety cabinet, raise the sash until its bottom edge aligns with the proper sash position label on the left corner post. The decal is shown in Figure 5-5.
2. Press the blower button to start the unit. The unit will display a standby screen for approximately 60 seconds to allow the cabinet to reach proper operating conditions. If the alarm sounds, recheck the sash position. If the sash is too high, the sash audible alarm and the LCD display will indicate the sash is too high.
3. To turn the UV light on, the sash must be completely closed to prevent the escape of any UV radiation. Push the UV light button to activate the UV light.

Note: The sash must be completely closed for the UV light to activate.

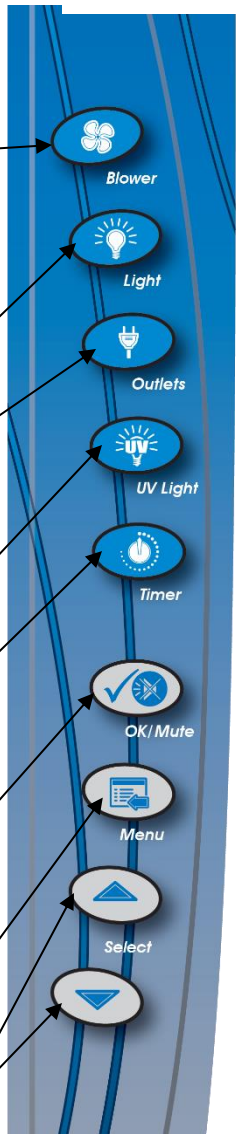
Figure 5-5



The Axiom Touchpad

The touchpad of the Axiom is shown in Figure 5-6. Take a moment to get familiar with the buttons, their locations and functions. Also familiarize yourself with the display located on the right side wall. The display will report system functions, such as filter capacity, timer displays, alarm or error messages, as well as icons that illuminate when cabinet functions such as UV light and blower are operational.

Figure 5-6



Blower Button – Starts or stops the cabinet blower. When the blower is in Smart-Start™ mode, opening the sash from the closed position turns the blower on automatically. When in recirculating mode with Night-Smart™, when the sash is closed, the motor slows to idle to maintain air cleanliness in the work area. When the sash is reopened, the blower resumes normal operation. Pressing this button overrides Smart-Start and Night-Smart operation.

Light Button – Turns the fluorescent lamps on or off. Closing the sash automatically turns the lights off. When the lights are in Smart-Start mode, raising the sash turns the lights on automatically.

Outlet Button – Turns the electrical outlets in the work area on or off.

UV Light Button – Turns the UV lamp on or off. When the UV lamp is in Smart-Start mode, closing the sash turns the light on. When the sash is raised, the light turns off automatically.

Timer Button – Allows you to select either a repeating interval timer, or an elapsed timer (stopwatch).

OK/Mute Button – Mutes all audible alarms for approximately 5 minutes, unless there is a system error or exhaust alarm. When in the Menu mode, this button is used to select an option.

Menu Button – This button toggles the display between the display and menu modes. When in the menu mode, pressing this button returns you to the previous menu level.

Select Buttons – Allow you to choose different options in the menu mode.

Navigating the Axiom Menu Screens

MyLogic™ allows you to use the Smart-Start or Night-Smart features that activate functions automatically when the sash is opened or closed. Night-Smart will only work if the cabinet is not connected to an exhaust system.

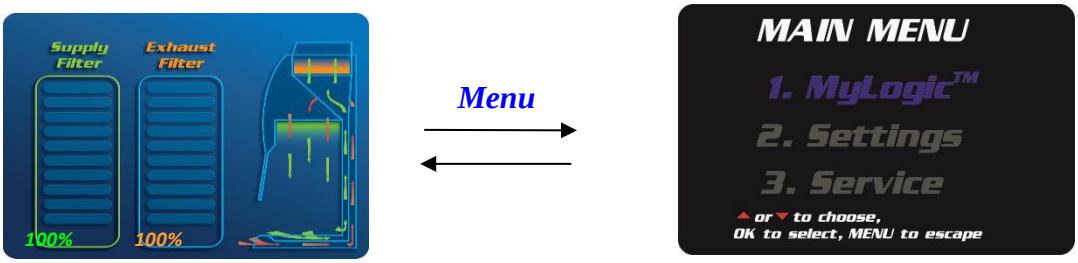
If equipped, the UV lamp can be programmed to operate for a given time interval when the sash is closed, before it shuts off.

NOTE: When you are in the menu mode, if a selection is not made within 30 seconds, the display will reset back to display mode.

Keypad operations are shown as ***blue bold italic***. Menu screen selections are shown as *green italics*.

NOTE: Pressing the appropriate touchpad button will override Smart-Start or Night-Smart selections.

To access the menu, press the ***Menu*** button. The display panel will show the first level menu. To select from the various menu options press the ▲ or ▼ buttons until the selected option is displayed. Press ***OK*** to accept that option, or press ***Menu*** to return to the previous menu level.



Display Mode

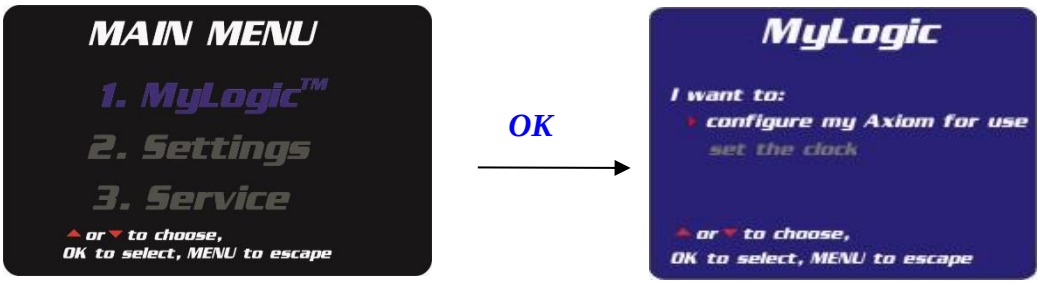
Menu Mode

Navigating the MyLogic™ Menu Screens

The MyLogic screens will allow you to set the cabinet's clock, and to personalize its operation. Please note all MyLogic screens have a blue background.

Setting the Clock

Using the ▲ and ▼ buttons on the touchpad, highlight the *MyLogic* option-it will turn blue when selected. Press ***OK*** to enter the first MyLogic screen:



Using the ▲ and ▼ buttons on the touchpad, highlight *set the clock* -it will turn white when selected. Press ***OK*** to enter the first clock setting screen:

At this screen, select whether you want the clock to display in a 12- or 24-Hour format. When you have highlighted your choice, press ***OK*** to go to the next screen…

Use the ▲ and ▼ buttons to select the hour, and press ***OK***…

Use the ▲ and ▼ buttons to select the minute, and press ***OK*** to return to the first MyLogic screen.

Configuring the Axiom

In the first MyLogic screen, use the ▲ and ▼ buttons on the touchpad to highlight *configure my Axiom for use* -it will turn white when selected. Press ***OK*** to enter the first configuration screen:

The first screen gives you the option of activating the Smart-Start option for the blower; if you want the cabinet blower to start every time you raise the sash, select *start*, and then press ***OK***. If *not start* is selected, then the blower must be manually started from the keypad. When ***OK*** is pressed, the next configuration screen will appear.

The next screen gives you the option of activating the Smart-Start option for the fluorescent light; if you want the lights to turn on every time you raise the sash, select *turn on*, and then press ***OK***. If *stay off* is selected, then the lights must be manually turned on from the keypad. When ***OK*** is pressed, the next configuration screen will appear.

If you want the cabinet blower to run slowly, maintaining reduced airflows every time you close the sash, select *go into Night-Smart mode* and then press ***OK***. If *stop* is selected, then the blower will stop when the sash is closed. When ***OK*** is pressed, the next configuration screen will appear.

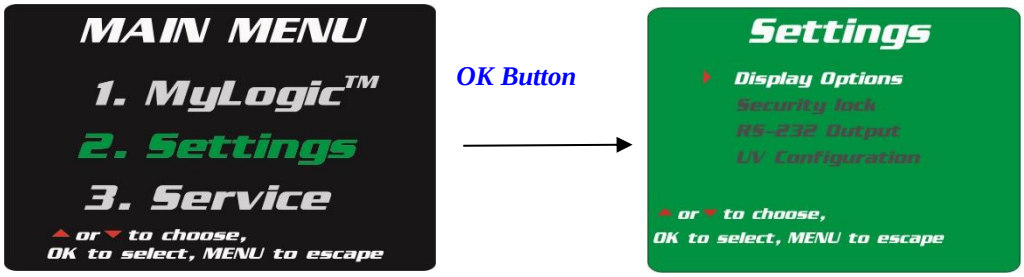
If your Axiom is configured for a UV light, then you will see the next two screens; if you want the UV lamp to turn on every time you close the sash, select *go into Night-Smart mode*, and then press ***OK***. If *stay off* is selected, then the UV light will not turn on when the sash is closed. When ***OK*** is pressed, the final configuration screen will appear.

If you choose to use Night-Smart option for the UV lamp, this screen allows you to control the time the UV lamp will remain on after the sash is closed. Use the ▲ and ▼ buttons on the touchpad to cycle through the time intervals available, and then press ***OK*** to select it. The screen will then return to the first MyLogic screen.

Navigating the Settings Menu Screens

The Settings screens will allow an administrator to set some of the cabinet's operational parameters. Please note all Settings screens have a green background.

Using the ▲ and ▼ buttons on the touchpad, highlight the *Settings* option-it will turn green when selected. Press ***OK*** to enter the first Settings screen:

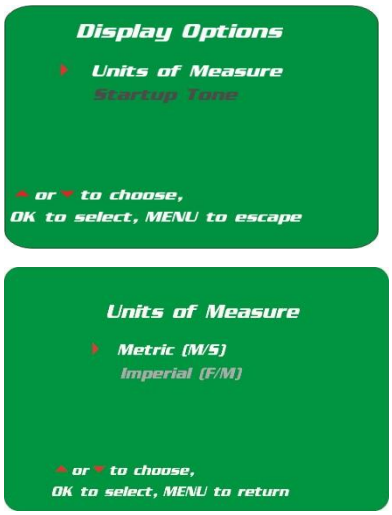


Display Options

Units of Measure

Note: The Units of Measure refers to the display of airflow velocities if the cabinet is equipped with the optional airflow sensor.

Using the ▲ and ▼ buttons on the touchpad, highlight the *Units of Measure* option-it will turn white when selected, and then press ***OK***. Using the ▲ and ▼ buttons on the touchpad, highlight either *metric* or *imperial* units of measure-it will turn white when selected, and then press ***OK***. The screen will then return to the first Settings screen.

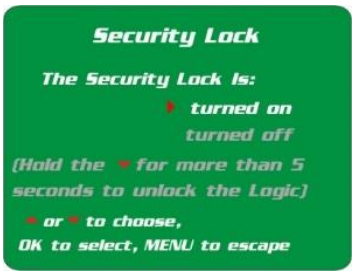


Startup tone

Using the ▲ and ▼ buttons on the touchpad, highlight the *Startup Tone* option-it will turn white when selected, and then press ***OK***. Using the ▲ and ▼ buttons on the touchpad, highlight either *Turned on* or *Turned off* option. When turned on, an audible beep will sound during the first 60 seconds of blower operation to caution the user that the unit is not yet ready for use.

Security Lock

Note: The Security Lock feature "locks" the keypad to prevent unauthorized use of the cabinet. The security lock is unlocked by holding the ▼ button for 5 seconds. After being turned on, the lock activates whenever the sash is closed, or the blower shuts off. Once unlocked, the lock must be reactivated if it is desired.



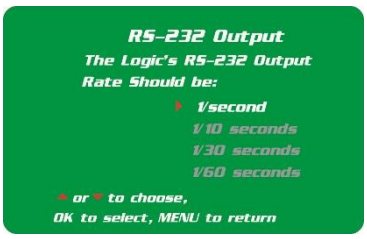
From the Settings menu screen, use the ▲ and ▼ buttons on the touchpad to highlight the *Security Lock* option-it will turn white when selected. Press ***OK*** to enter the Security Lock screen. Using the ▲ and ▼ buttons on the touchpad, highlight either *turned on* or *turned off*-it will turn white when selected, press ***OK***. The screen will then return to the first Settings screen.

RS-232 Output Rate

Note: This selection will only work if the optional EN/RS-232 board is installed.

This menu option selects the rate that the RS-232 board outputs data. Data can be output at a rate of once per second, once every 10 seconds, once every 30 seconds, or once per minute.

From the Settings menu screen, use the ▲ and ▼ buttons on the touchpad to highlight the *RS-232 output*-it will turn white when selected. Press ***OK*** to enter the RS-232 output screen. Using the ▲ and ▼ buttons on the touchpad, highlight either the data output rate preferred. It will turn white when selected, and then press ***OK***. The screen will then return to the first Settings screen.



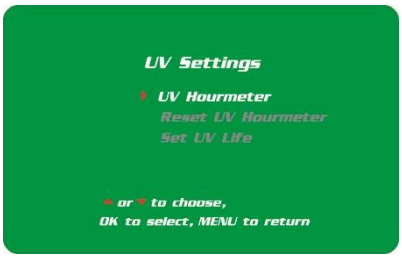
UV Settings

For models equipped with the optional UV light the Axiom has an integral UV light maintenance system. It allows you to define how many hours you want the UV lamp to operate before receiving a reminder to replace it, a way to monitor how many hours the lamp has been on, and the means to reset the UV lamp hourmeter.

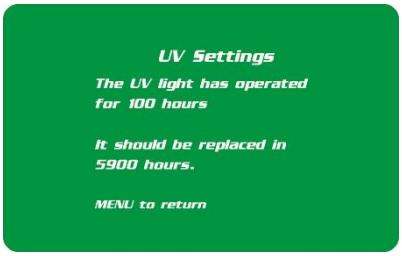
UV Lamp Hourmeter

This display only shows how many hours the UV lamp has been lit, and how many hours remain until you will receive a warning to replace the lamp.

From the Settings menu screen, use the ▲ and ▼ buttons on the touchpad to highlight the *UV Settings* option-it will turn white when selected. Press ***OK*** to enter the UV Settings screen. Using the ▲ and ▼ buttons on the touchpad, highlight UV Hourmeter-it will turn white when selected, and then press ***OK***. The screen will then return to the UV Hourmeter screen.



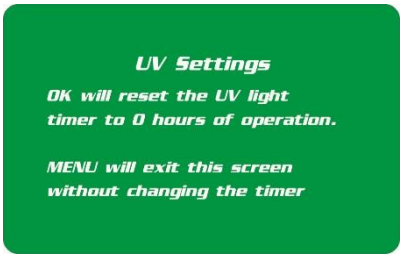
This screen displays how many hours the UV lamp has operated, and how many hours of operation remain before replacement is recommended. When finished with this screen, press ***MENU*** to return to the first UV Settings screen.



Reset UV Lamp Hourmeter

This option lets you reset the UV hourmeter to 0 hours whenever the lamp has been replaced.

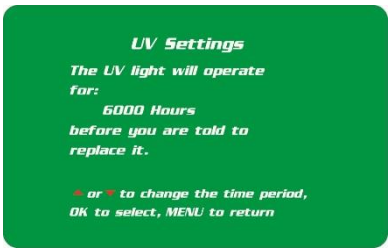
This screen allows you to reset the UV Hourmeter to 0 hours if you press ***OK***. Pressing ***MENU*** will return you to the first UV Settings screen without resetting the hourmeter.



Change UV Lamp Life

In this screen, you can set the number of operating hours before receiving the replace UV lamp warning. For most UV lamps, the output of UV light decreases at a constant rate. Typically, after 6,000 hours of operation the lamp will output 80% of the UV light it did when it was new. This option allows you to set operational life of the UV lamp, in 100 hour increments.

From the UV Settings menu screen, use the ▲ and ▼ buttons on the touchpad to highlight the *Set UV Life* option-it will turn white when selected. Press ***OK*** to enter the Set UV life screen. Use the ▲ and ▼ buttons to increase or decrease the lamp life in 100 hour increments, until the desired value is displayed, and then press ***OK***. The screen will then return to the UV Settings screen.



The Service Menu Screens

Note: The Service Menu screens are reserved for use by trained certification personnel as part of the certification or service procedures. All of the screens have a yellow background, and those portions of the Service Menu screens that can alter the performance of the Axiom are password protected. If you have any questions about these screens, contact Labconco's Product Service Department at 1-800-821-5525 or www.labconco.com for assistance.

Timer Operation

NOTE: The timer button allows activation of an interval (countdown) or stopwatch (elapsed) timer. The timers cannot be operated simultaneously.

To access the main timer menu, press the ***Timer*** button anytime during normal operation. The main timer menu is shown on the LCD display. Use the ▲ and ▼ buttons to highlight the *Interval* or *Stopwatch* Timer. Press the ***OK*** button to select the highlighted timer function.

Interval Timer Operation

1. When selected, the Interval Timer menu is displayed on the LCD. The timer defaults to 0:00:00 (hours:minutes:seconds).
2. Press and hold the ▲ or ▼ buttons to increase or decrease the timer interval.
3. When the proper interval is entered on the display, press the ***OK*** button to start the timer.

4. When the timer reaches 0:00:00, an audible alarm will sound, and the timer will reset itself and repeat the countdown.
5. Press the ***OK*** button to pause the timer.
6. Press the ***Menu*** button to clear the interval timer and return to the main timer menu.

Stopwatch Timer Operation

1. When selected, the Stopwatch Timer menu is displayed on the LCD. The timer defaults to 0:00:00.
2. Press the ***OK*** button to start the timer.
3. Press the ***OK*** button again to zero the timer.
4. Press the ***Menu*** button to clear the stopwatch timer and return to the main timer menu.

If An Airflow Alert Activates

The most common causes of an Airflow Alert are:

- Blockage of the inlet grilles or exhaust outlet.
- Removal of the work surface or grille during operation.

Resetting the Airflow Alert System

The Airflow Alert automatically resets to normal operation once the motor speed has stabilized.

Working In the Biosafety Cabinet

Note: A more thorough review of using the BSC can be found in: *Biosafety in Microbiological and Biomedical Laboratories (BMBL)*, Published by the Centers for Disease Control and Prevention (www.cdc.gov/biosafety/publications).

Planning

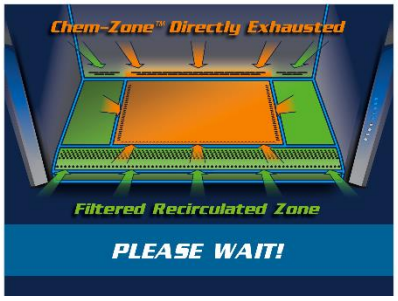
- Thoroughly understand procedures and equipment required before beginning work.
- Arrange for minimal disruptions, such as room traffic or entry into the room while the cabinet is in use.

Start-up

- Turn off UV light if included.
- Slowly raise the sash until the bottom of the sash aligns with the sash indicator decal located on the left side of the work area.
- Turn on the fluorescent light and cabinet blower if the Smart-Start features have not been activated.
- Check the air grilles for obstructions.

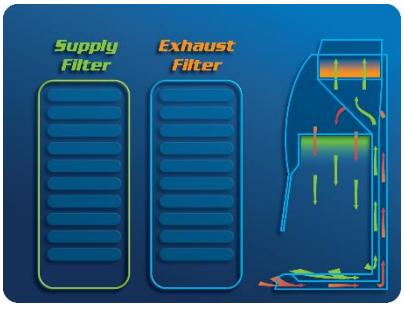
- Allow the cabinet to operate until the display screen is shown.

Warm up screen-



Connected to an exhaust system

no exhaust system



Display screen

- Wash hands and arms thoroughly with germicidal soap.
- Wear appropriate personnel protective equipment (PPE).

Wipe-Down

- Raise the sash to its full open position (approximately 22.6 inches or 574 mm). Mute the alarm by depressing the "OK/Mute" switch.
- Wipe down the interior surfaces of the cabinet with 70% ethanol, or a suitable disinfectant, and allow to dry.

Loading Materials and Equipment

- Only load the materials required for the procedure. Do not overload the cabinet.
- Do not obstruct the front, side, or rear return air grilles.
- Large objects should not be placed close together.
- Slowly close the sash until it is in the correct operating position.
- After loading the cabinet, wait two to three minutes to purge airborne contaminants from the work area.

Work Techniques

- If your work involves volatile toxic chemicals or radionuclides, ensure that the Type C1 is connected to an operational exhaust system, and is properly configured. Keep these materials in the center work area, so that any air flowing over these materials will be directed to the exhaust HEPA filter and out of the lab.
- Keep all materials at least 4 inches (100 mm) inside from the sash, and perform all contaminated operations as far to the rear of the work area as possible.
- Segregate all clean and contaminated materials in the work area.
- Arrange materials to minimize the movement of contaminated materials into clean areas.
- Keep all discarded contaminated material to the rear of the work area.
- Avoid moving materials or the operator's hands and arms through the front access opening during use.
- Avoid the use of an open flame. Use disposable labware or an electric incinerator as alternatives.
- Use proper aseptic technique.
- Avoid using techniques or procedures that disrupt the airflow patterns of the cabinet.
- If there is a spill or splatter during use, all objects in the cabinet should be surface decontaminated before removal. Thoroughly disinfect the working area of the cabinet WHILE IT IS STILL IN OPERATION, to prevent the release of contaminants from the cabinet.

Final Purging

- Upon completion of work, the cabinet should be allowed to operate for two to three minutes undisturbed, to purge airborne contaminants from the work area.

Unloading Materials and Equipment

- Objects in contact with contaminated material should be surface decontaminated before removal from the cabinet.
- All open trays or containers should be covered before being removed from the cabinet.

Wipe-Down

- Wipe down the interior surfaces of the cabinet with a suitable disinfectant, or 70% ethanol, and allow to dry.
- Periodically lift the work surface and wipe down the area beneath it.

- Inspect and clean the towel catch located at the rear of the work area, beneath the work pan.
- Dispose of rubber gloves appropriately, and have lab coat laundered properly.
- Wash hands and arms thoroughly with germicidal soap.

Shutdown

- Lower the sash to turn off the fluorescent light and cabinet blower and activate the UV light if appropriate.

Chapter 6:
Maintaining the Cabinet

The common service operations necessary to maintain the biosafety cabinet for peak performance are listed below.

Note: This manual covers operation and maintenance operations for the owners/users of the Axiom biosafety cabinets. Complete certification procedures, service operations and specifications are published in a separate publication *Technical Manual: Purifier® Axiom® Biosafety Cabinets.* This manual is available from Labconco's website: www.labconco.com. A complete certifier service kit is available to qualified certifiers from Labconco. Call Labconco's Product Service Department at 800-821-5525 or 816-333-8811.

Do NOT contact blower wheel while still in motion.

NE PAS être en contact avec la roué du ventilateur tant qu'il est en marche.

Routine Maintenance Schedule

Weekly

- Wipe down the interior surfaces of the cabinet with a suitable disinfectant, or 70% ethanol, and allow to dry.
- Using an appropriate glass cleaner clean the sash and the surface of the UV lamp, if so equipped.
- Operate the cabinet blower, noting the percent filter life remaining in an operational log.

Monthly (or more often as required)

- Using a damp cloth clean the exterior surfaces of the cabinet, particularly the front and top of the cabinet, to remove any accumulated dust.
- Disinfect and lift the work surface. Surface disinfect the area beneath the work surface with a suitable disinfectant, or 70% ethanol, and allow to dry. Check the towel catch for retained materials.

- Check all service valves, if so equipped, for proper operation.
- Check the UV and fluorescent light hourmeters, and record their readings in an operational log.
- All weekly activities.

Semiannually or Annually

- Have the cabinet re-certified by a qualified certification technician.
- All monthly activities.

Service Operations

Center Work Surface Removal:

Note: The work surface must be thoroughly decontaminated before removing it from the cabinet.

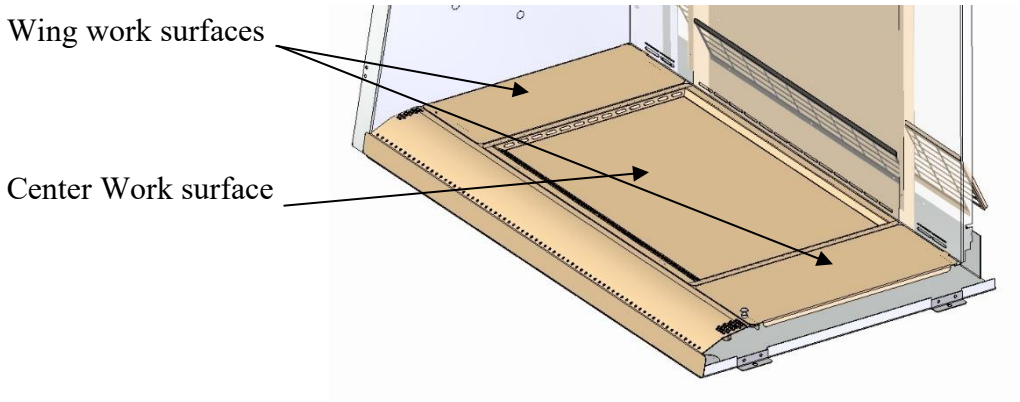
1. Lift either of the wing work surfaces up by grasping the knob handles at either front corner.
2. This will lift up the center work surface. Lift the front edge up, pivoting the work surface on its back edge until the front edge of the work surface engages the catch located on the back wall of the work area.
3. Reinstall the work surface by supporting it while lifting up on the catch to release the work surface. Gently lower the center work surface, being sure to engage the pins on the front corners of the work surface with the holes in the grille, as shown in Figure 6-1.

Wing Work Surfaces Removal:

Note: The work surfaces must be thoroughly decontaminated before removing it from the cabinet.

1. Lift the front edge of either wing work surface straight up by grasping the knob handles. This will raise the front edge of the center work surface.
2. Lift the front edge up, pivoting the work surface on its back edge until the front edge of the work surface engages the catch located on the back wall of the work area.
3. Lift and pull both wing work surfaces out.
4. Reinstall the wing work surfaces by engaging the tab on the back corner of the work surface with the slot on the rear wall of the work area. Reinstall the work surface by supporting it while lifting up on the catch to release the work surface. Gently lower the center work surface, being sure to engage the pins on the front corners of the work surface with the holes in the grille, as shown in Figure 6-1.

Figure 6-1

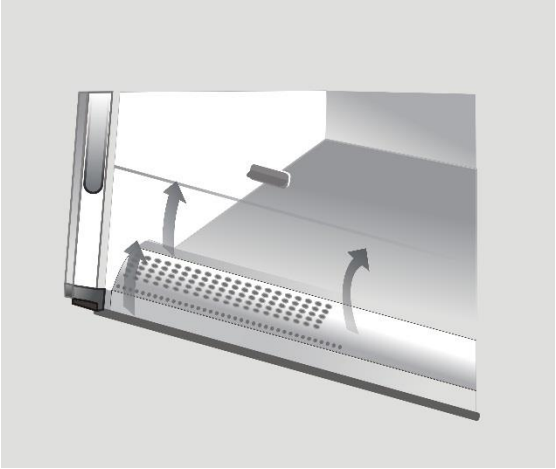


Front Grille Removal:

Note: The grille must be thoroughly decontaminated before removing it.

1. Remove the work surface as described earlier.
2. At one end of the grille, grip the front of grille with one hand, and the back with the other hand. Pivot that end of the grille upward and inward, paralleling the angle of the sash, as shown in Figure 6-2.
3. Pull the other end of the grille up and away from the bottom edge of the cabinet.
4. Reinstall the grille by reversing the above sequence, ensuring that the grille properly engages the bottom edge of the cabinet.

Figure 6-2



Font Panel Removal and Installation:

Figure 6-3

1. Locate and remove the two Phillips screws that secure the front panel as shown in Figure 6-3. They are located on the bottom corners of the front dress panel.

2. Swing the bottom of the dress panel out to clear the fluorescent light and then lift the front dress panel straight up and away from the cabinet.

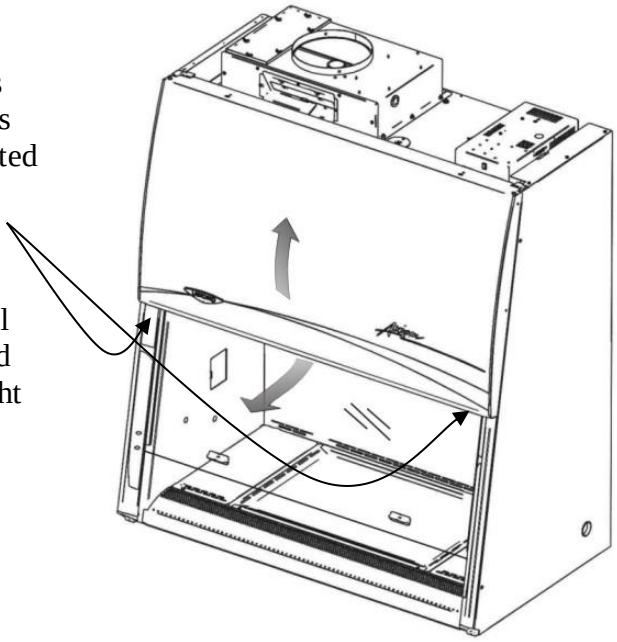
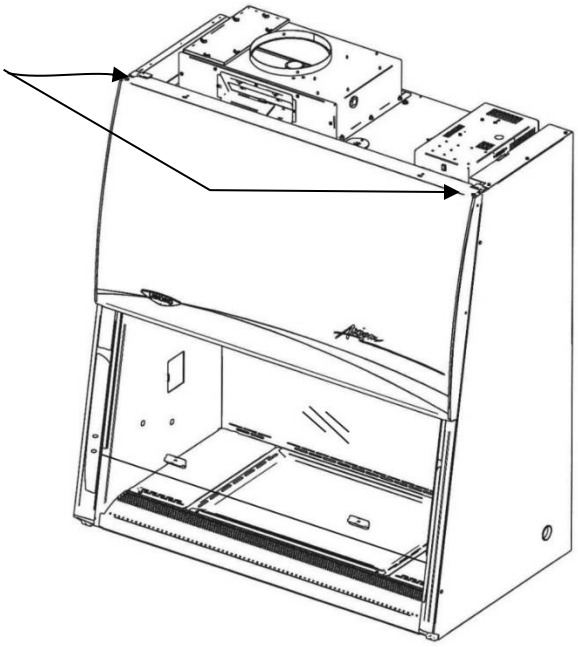


Figure 6-4

1. To reinstall the panel, reverse these steps, ensuring that the plastic pin in the top corners of the dress panel properly engage the corner posts.



Changing the Fluorescent Lamps:

1. Unplug the cabinet or turn off the System Reset Switch located on the top of the cabinet.
2. Remove the front dress panel as noted in Figure 6-3.
3. Remove the fluorescent lamps by pulling the lamp sockets straight off each end of the lamp, and releasing both lamps from the spring clips that secure them in place.
4. Install the new lamps by reversing the removal procedure.

Hg

THE LAMP(S) IN THIS PRODUCT CONTAIN MERCURY

Manage in accordance with local disposal laws. DO NOT place lamps in trash. Dispose as a hazardous waste. For information regarding safe handling, recycling and disposal, consult www.lamprecycle.org

CETTE LAMPE DANS CE PRODUIT CONTIENT DU MERCUE

Éliminez ou recyclez conformément aux lois applicables. Pour de l'information concernant des pratiques de manipulation sécuritaires et l'élimination sécuritaire et le recyclage, veuillez consulter www.lamprecycle.org

Changing the Optional UV Lamp:

Note: For optimum performance, the UV lamp should be changed on an annual basis, or as indicated by the UV lamp timer.

The UV lamp and the work area of the cabinet must be thoroughly decontaminated before removing the lamp.

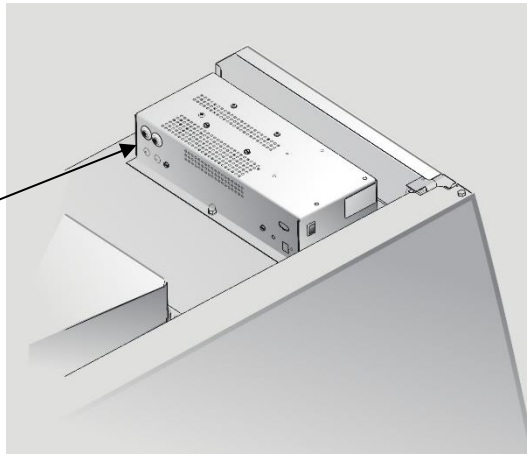
1. Start the cabinet and let it operate for 5 minutes.
2. Raise the sash to its full open position.
3. Thoroughly surface decontaminate the UV lamp and the work area of the cabinet.
4. Unplug the cabinet or turn off the System Reset Switch, located on the top of the cabinet.
5. Remove the UV lamp by rotating it 90 degrees and lifting it straight up and out of its sockets.
6. Install new lamp by reversing the removal procedure.

Resetting a Circuit Breaker:

To reset any of the circuit breakers located on the left side of the electronics module, depress the white button until it sets.

Circuit Breakers- The front breaker protects the electrical outlets, the rear breaker protects the motor and lights.

Figure 6-5



Storage

If the biosafety cabinet is to be left unused for more than one month, it should be prepared for storage.

Note: The cabinet should not be stored in areas of excess humidity or temperature extremes. If the cabinet is moved during storage, it must be recertified before use.

1. Close the sash completely and seal the bottom edge and the exhaust outlet with plastic sheeting.
2. Unplug the cabinet.
3. Ensure that the cabinet will not be moved or disturbed while being stored.

Chapter 7: Troubleshooting

Refer to the following table if the biosafety cabinet fails to operate properly. If the suggested corrective actions do not solve the problem, contact Labconco for additional assistance.

PROBLEM	CAUSE	CORRECTIVE ACTION
Cabinet blower and lights won't turn on	Unit not plugged into outlet	Plug the biosafety cabinet into appropriate electrical service.
		Check connection to control box on top of cabinet.
	System Reset Switch is Off	Turn on the System Reset Switch.
	Circuit breaker(s) tripped	Reset circuit breakers.
	Keypad disconnected or defective	Run sash sensor diagnostic and check connections.
Blower won't turn on	Sash closed	Raise sash.
	Keypad disconnected or defective	Run sash sensor diagnostics and check connections.
	Blower wiring is disconnected	Inspect blower wiring.
	Blower motor is defective	Replace blower motor.

PROBLEM	CAUSE	CORRECTIVE ACTION
Fluorescent light not working	Sash is closed	Open sash – Fluorescent lights will not work with the sash closed.
	Lamp(s) are defective	Replace defective lamp(s)
	Lamp wiring is disconnected	Inspect lamp wiring.
	Defective lamp ballasts	Replace lamp ballasts.
	Keypad disconnected or defective	Run sash sensor diagnostics and check connections.
Fluorescent light is dim or flickering	Lamp(s) are defective	Replace defective lamp(s)
	Lamp wiring is disconnected	Inspect lamp wiring.
	Defective lamp ballast	Replace lamp ballast.
UV light not working	Sash is open	Close sash – UV light will not work with the sash open.
	Lamp is defective	Replace defective lamp.
	Lamp wiring is disconnected	Inspect lamp wiring.
	Defective lamp ballast	Replace lamp ballast.
	Keypad disconnected or defective	Run keypad diagnostics and check connections.
UV light is dim or flickering	Lamp is defective or is at end of operating lifetime.	Replace defective or worn out lamp.
	Lamp wiring is disconnected	Inspect lamp wiring.
	Defective lamp ballast	Replace lamp ballast.

PROBLEM	CAUSE	CORRECTIVE ACTION
Airflow Alert goes off and/or there is a slight decrease in filter life gauge	HEPA filter loading	The gauge reading steadily decreases as the cabinet is used.
	Blockage of the return air slots or grille	Check all return air slots and grilles to ensure that they are not blocked or restricted.
	Blockage of the exhaust outlet	Ensure that the exhaust outlet is not blocked or restricted.
	Blockage or restriction under the work surface	Ensure that the towel catch and plenum beneath the work surface are unobstructed.
Contamination of work in the cabinet	Improper technique or procedure for the biosafety cabinet	See “Use of the cabinet” section in the manual.
	Restriction of the return air slots or grille – blockage of the exhaust outlet	Ensure that all return air slots, grilles and the exhaust outlet are unobstructed.
	External factors are disrupting the cabinet airflow patterns or acting as a source of contamination	See “Working in the Biosafety Cabinet” section of this manual.
	Cabinet is out of adjustment/HEPA filter(s) are defective	Have cabinet recertified.
Exhaust Alarm goes off	Roof blower is off	Ensure that roof blower is working.
	Remote blower is improperly sized	Confirm that the roof mounted blower meets the volume and pressure requirements of the cabinet.
	Mechanical failure of the exhaust system	Inspect the exhaust system.
	Leak or additional ‘load’ on the exhaust system	Inspect the exhaust system

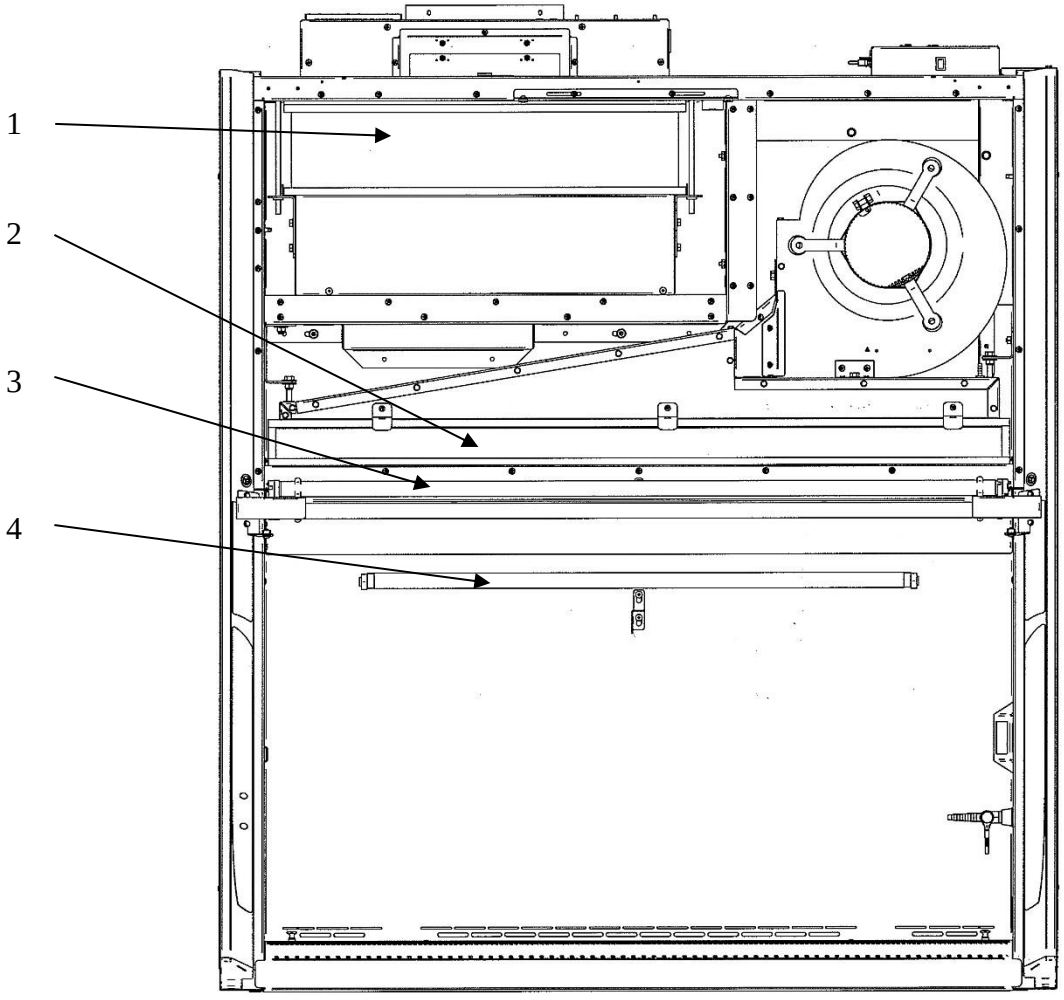
Appendix A: Components

Illustration A-1 indicates the location of the following service parts, and replacement accessory parts:

Biosafety Cabinet Replacement Parts

Item	Quantity	Part No.	Description
1	1	3838511	Exhaust HEPA Filter 4-ft
1A	1	3838513	Exhaust HEPA Filter 6-ft
2	1	3838401	Supply HEPA Filter 4-ft
2A	1	3838403	Supply HEPA Filter 6-ft
3	2	9721900	Lamp, Fluorescent, 4-ft
3A	2	9721903	Lamp, Fluorescent, 6-ft
4	1	1271300	Lamp, UV (models with UV light only)

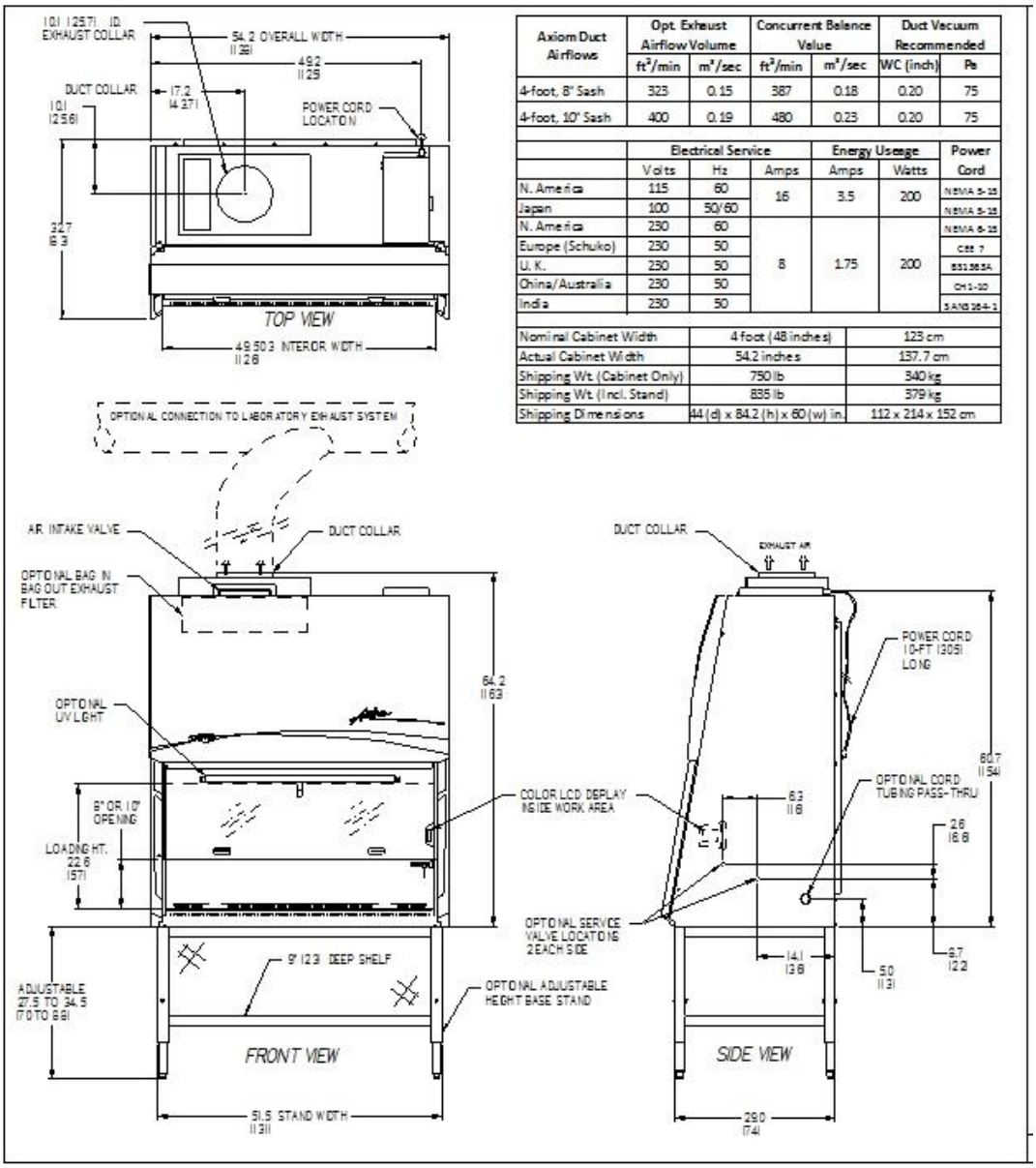
A-1



Appendix B: Dimensions – 4 foot models

All dimensions in inches (cm).

B-1



Axiom Duct Airflows	Opt. Exhaust Airflow Volume		Concurrent Balance Value		Duct Vacuum Recommended	
	ft³/min	m³/sec	ft³/min	m³/sec	WC (inch)	Pa
4-foot, 8" Sash	323	0.15	387	0.18	0.20	75
4-foot, 10" Sash	400	0.19	480	0.23	0.20	75

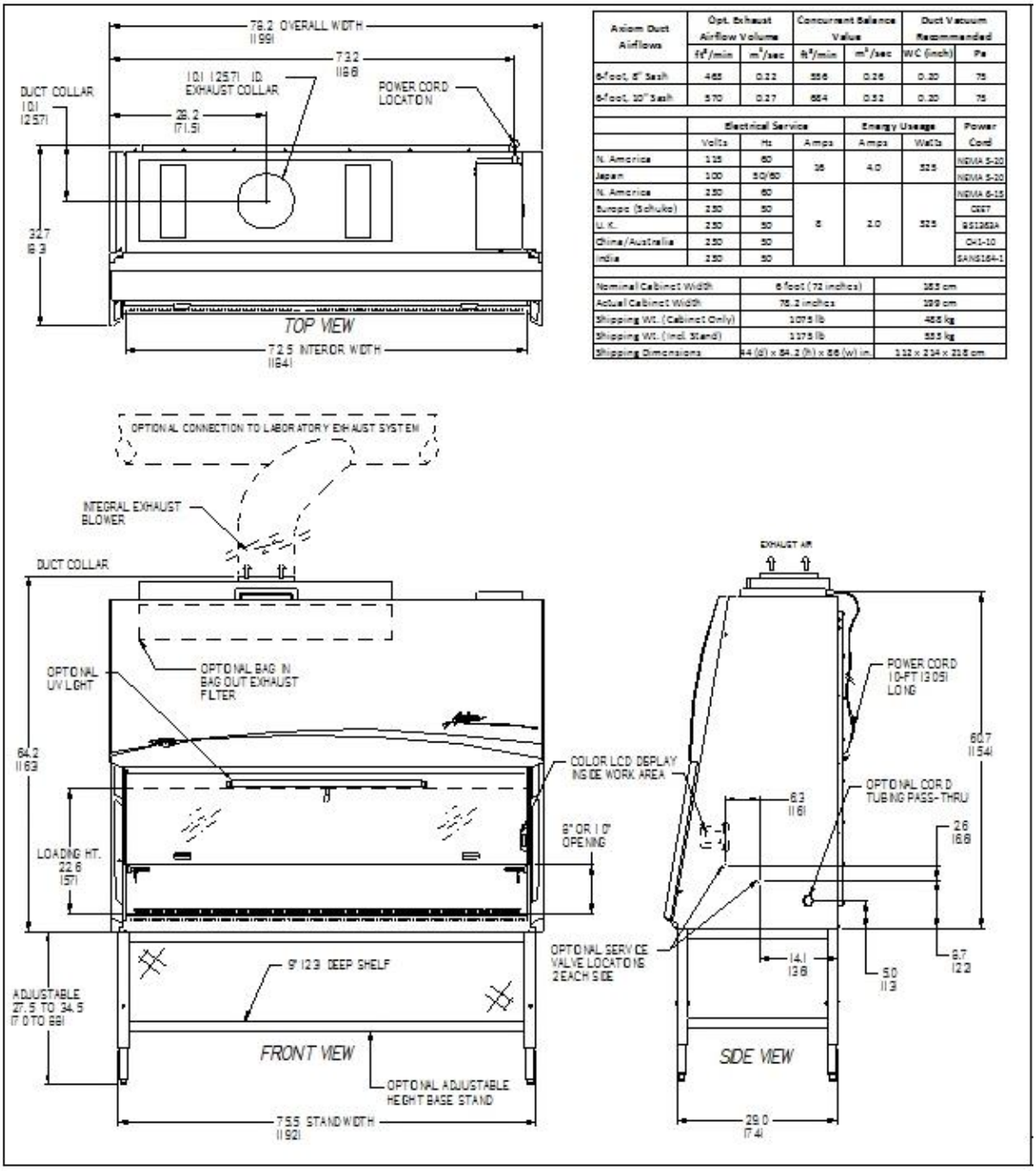
	Electrical Service			Energy Useage		Power Cord
	Volts	Hz	Amps	Amps	Watts	
N. America	115	60	16	3.5	200	NEMA 5-15
Japan	100	50/60				NEMA 5-15
N. America	230	60	8	1.75	200	NEMA 6-15
Europe (Schuko)	230	50				CEE 7
U. K.	230	50				BS1363A
China/Australia	230	50				CH1-10
India	230	50				SANS164-1

Nominal Cabinet Width	4 foot (48 inches)	123 cm
Actual Cabinet Width	54.2 inches	137.7 cm
Shipping Wt. (Cabinet Only)	750 lb	340 kg
Shipping Wt. (Incl. Stand)	835 lb	379 kg
Shipping Dimensions	44 (d) x 84.2 (h) x 60 (w) in.	112 x 214 x 152 cm

Dimensions – 6 foot models

All dimensions in inches (cm).

B-2



Axiom Duct Airflows	Opt. Exhaust Airflow Volume		Concurrent Balance Value		Duct Vacuum Recommended	
	ft³/min	m³/sec	ft³/min	m³/sec	WC (inch)	Pa
6-foot, 6" Sash	465	0.22	336	0.26	0.20	75
6-foot, 10" Sash	570	0.27	684	0.32	0.20	75

	Electrical Service			Energy Usage		Power Cord
	Volts	Hz	Amps	Amps	Watts	
N. America	115	60	16	4.0	525	NEMA 5-20
Japan	100	50/60				NEMA 5-20
N. America	230	60	8	2.0	525	NEMA 6-15
Europe (Schuko)	230	50				CEE7
U.K.	230	50				BS1363A
China/Australia	230	50				CH1-10
India	230	50				SANS164-1

Nominal Cabinet Width	6 foot (72 inches)	183 cm
Actual Cabinet Width	78.2 inches	199 cm
Shipping Wt. (Cabinet Only)	1075 lb	488 kg
Shipping Wt. (Incl. Stand)	1175 lb	533 kg
Shipping Dimensions	84 (d) x 84.2 (h) x 86 (w) in.	112 x 214 x 218 cm

Appendix C: Specifications

Electrical Data

Model #	Requirements
3044xxx0x	115 VAC, 60 Hz, 16 Amps
3044xxx2x	100 VAC, 50/60 Hz, 16 Amps
3044xxx-10, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 8 Amps
3046xxx0x	115 VAC, 60 Hz, 16 Amps
3046xxx2x	100 VAC, 50/60 Hz, 16 Amps
3046xxx-10, 30, 40, 50, 60, 70, 80	230 VAC, 50/60 Hz, 8 Amps

Motor Specifications

Cabinet Model	Electrical Requirements
All Cabinets, all Voltages	2- 1/3 H.P. Electronically Commutated Motor (ECM) 120-240 VAC – 50/60 Hz, Full Torque – 28 Oz.-Ft (3.56 N-M) 5 Full Load Amps @115VAC 2.6 Full Load Amps @230VAC Automatic Thermal Protection

Environmental Conditions

- Indoor use only.
- Ambient temperature range: 41° to 104°F (5° to 40°C).
- Maximum relative humidity: 80% for temperatures up to 88°F (31°C), decreasing linearly to 50% relative humidity at 104°F (40°C).
- Main supply voltage fluctuations not to exceed ±10% of the nominal voltage.
- Transient overvoltages according to Installation Categories II (Overvoltage Categories per IEC 1010). Temporary voltage spikes on the AC input line that may be as high as 1500V for 115V models and 2500V for 230V models are allowed.
- Used in an environment of Pollution degrees 2 (i.e., where normally only non-conductive atmospheres are present). Occasionally, however, a temporary conductivity caused by condensation must be expected, in accordance with IEC 664.

Appendix D: Accessories

Labconco offers a full line of accessories to enhance your Axiom's operation and usability. For a complete list of these accessories, please consult our website at www.labconco.com .

Appendix E: Quick Chart

Model	30441_	30448_	30461_	30468_
Type	C1	C1	C1	C1
Cabinet Size (in feet)	4	4	6	6
Sash Opening (inches)	10	8	10	8
Starting Serial #[1]	1403_	1403_	1403_	1403_
Nominal Avg. Downflow (FPM)	65+/-5	65+/-5	55+/-5	55+/-5
Nominal Average Inflow (FPM)	105+/-5	105+/-5	105+/-5	105+/-5
Airflow Volume (CFM)	400	323	570	463
Concurrent Balance Volume (CFM)	480	387	684	556
Recommended Duct Vacuum (WC)	.4	.4	.4	.4
Supply HEPA Data				
Labconco P/N	3838401	3838401	3838403	3838403
Exhaust HEPA Data				
Labconco P/N	3838511	3838511	3838513	3838513
Fluorescent/UV Lamp Data				
Fluorescent Lamps (2 each)	F32T8 TL741	F32T8 TL741	F40T8 SP41	F40T8 SP41
UV Lamp	G30T8	G30T8	G30T8	G30T8

1. The primary serial tag is on the lower outside edge of the front dress panel. The secondary serial tag is located on the front of the electronics module on the top right side of the cabinet. The first two digits of the serial number are the year of production; the next two are the month. The next 5 digits are the sequence of production, and the letter following the serial number is the revision level of the cabinet.
2. Each motor must be programmed by Labconco for the appropriate width cabinet.