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User's Manual

Protector[®] Stainless Steel Radioisotope Laboratory Fume Hoods

Models

1204 Series
1205 Series
1206 Series
1208 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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The warranty for Protector® Stainless Steel Radioisotope Laboratory Fume Hoods will expire one year from date of installation or two years from date of shipment from Labconco, whichever is sooner. Warranty is non-transferable and only applies to the owner (organization) of record.

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

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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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CHAPTER 1

INTRODUCTION

Congratulations on your purchase of a Labconco Protector® Stainless Steel Radioisotope Laboratory Fume Hood. The Protector Stainless Steel Radioisotope Laboratory Hood is designed to efficiently ventilate procedures using radiochemicals. It is the result of Labconco's more than 50 years experience in manufacturing fume hoods, and users like you suggested many of its features to us.

The Labconco Protector Stainless Steel Radioisotope Fume Hood has been engineered to provide maximum safety in a laboratory while using low level Alpha and lower level Beta particles, and effectively contain toxic, noxious, or other harmful materials when properly installed. The Protector Radioisotope Hood offers many unique features to enhance safety, performance, and visibility. 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 fume hoods operate, please review *Chapter 4: Performance Features and Safety Precautions* before you begin working in the fume hood. Even if you are an experienced fume hood user, please review *Chapter 5: Using the Protector Radioisotope*, which describes your Protector Radioisotope Hood's features so that you can use the hood efficiently.

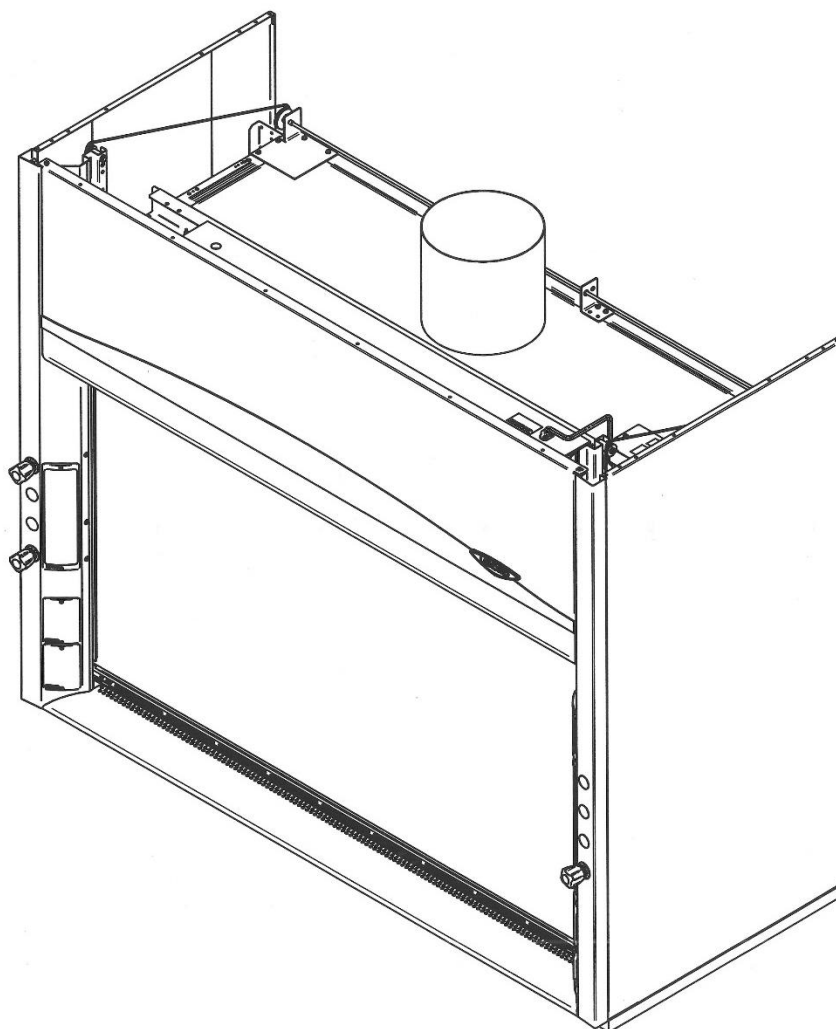


Figure 1-1

About This Manual

This manual is designed to help you learn how to install, use, and maintain your laboratory fume hood. Instructions for installing optional equipment on your hood are also included.

Chapter 1: Introduction provides a brief overview of the laboratory fume hood, explains the organization of the manual, and defines the typographical conventions used in the manual.

Chapter 2: Prerequisites explains what you need to do to prepare your site before you install your laboratory fume hood. Electrical and service requirements are discussed.

Chapter 3: Getting Started contains the information you need to properly unpack, inspect, install, and certify your laboratory fume hood.

Chapter 4: Performance Features and Safety Precautions explains how the Protector operates and the appropriate precautions you should take when using the fume hood.

Chapter 5: Using The Protector Radioisotope discusses the basic operation of your fume hood. Information on how to prepare, use and shut down your Protector Hood are included.

Chapter 6: Maintaining The Protector Radioisotope explains how to perform routine maintenance on your fume hood.

Chapter 7: Modifying The Protector Radioisotope explains how to modify the fume hood or add accessories.

Chapter 8: Troubleshooting contains a table of problems you may encounter while using your laboratory fume hood including the probable causes of the problems and suggested corrective actions.

Appendix A: Protector Radioisotope Components contains labeled diagrams of all of the components of the fume hoods.

Appendix B: Protector Radioisotope Dimensions contains comprehensive diagrams showing all of the dimensions for the laboratory fume hoods.

Appendix C: Protector Radioisotope Specifications contains the electrical requirements for laboratory fume hood. Wiring diagrams are also included.

Appendix D: Serial Number Tag Description provides current rating code used on serial number tag.

Appendix E: References lists the various resources available that deal with laboratory fume hoods.

Appendix F: VAV Open Area Guidelines to properly assess fume hood effective area whenever variable air volume (VAV) mechanical systems are installed.

Typographical Conventions

Recognizing the following typographical conventions will help you understand and use this manual:

- Book, chapter, and section titles are shown in italic type (e.g., *Chapter 3: Getting Started*).
- Steps required to perform a task are presented in a numbered format.
- Comments located in the margins provide suggestions, reminders, and references.

Chapter 1: Introduction

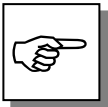


- Critical information is presented in boldface type in paragraphs that are preceded by the exclamation icon. Failure to comply with the information following an exclamation icon may result in injury to the user or permanent damage to fume hood.
- Les informations critiques sont présentées en gras dans les paragraphes qui sont précédés par l'icône d'exclamation. Ne pas se conformer aux informations qui suivent une icône d'exclamation peut résulter à la blessure de l'utilisateur ou à des dommages irréversibles de la hotte aspirante.



- Critical information is presented in boldface type in paragraphs that are preceded by the wrench icon. These operations should only be performed by a trained certifier or contractor. Failure to comply with the information following a wrench icon may result in injury to the user or permanent damage to your hood.

- Les informations critiques sont présentées en gras dans les paragraphes qui sont précédés par l'icône de clé plate. Ces opérations devraient être seulement exécutées par un professionnel agréé. L'échec pour se conformer aux informations qui suivent une icône de clé plate peut résulter à la blessure de l'utilisateur ou à des dommages irréversibles de la hotte.



- Important information is presented in capitalized type in paragraphs that are preceded by the pointer icon. It is imperative that the information contained in these paragraphs be thoroughly read and understood by the user.



- The S icon indicates the text is specific to the standard model.



- The A icon indicates the text is specific to the A-Style Combination Sash Model.



- CAUTION – See Manual. When this symbol is on a fume hood it indicates a caution that is detailed in this manual.
- PRUDENCE – Consulter le Manuel. Quand ce symbole est sur une hotte aspirante, il indique une prudence qui est détaillée dans ce manuel.



- CAUTION – Hot Surface.
- AVERTIR – Surface Chaude



- CAUTION – See Manual. This symbol on the fume hood indicates the possibility of a pinch hazard.
- PRUDENCE – Consulter le Manuel. Ce symbole sur la hotte indique la possibilité d'un risque de pincement.

Your Next Step

If your Fume Hood needs to be installed, proceed to *Chapter 2: Prerequisites* to ensure your installation site meets all of the requirements. Then, go to *Chapter 3: Getting Started* for instructions on how to install your laboratory fume hood and make all of the necessary connections.

If you would like to review how laboratory fume hoods operate, go to *Chapter 4: Performance Features and Safety Precautions*.

For information on the operational characteristics of your laboratory fume hood, go to *Chapter 5: Using The Protector Radioisotope*.

If your laboratory fume hood is installed and you need to perform routine maintenance on the cabinet, proceed to *Chapter 6: Maintaining Your Protector Radioisotope*.

For information on making modifications to the configuration of your fume hood, go to *Chapter 7: Modifying The Protector Radioisotope*.

Refer to *Chapter 8: Troubleshooting* if you are experiencing problems with your fume hood.

CHAPTER 2

PREREQUISITES

Before you install your laboratory fume hood, you need to prepare your site for installation. Carefully examine the location where you intend to install your hood. 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 the requirements for your installation site:

- The location requirements.
- The support requirements.
- The exhaust requirements.
- The optional filter pack requirements.
- The electrical power requirements.
- The service line requirements.
- The space requirements.

Refer to *Appendix B: Protector Radioisotope Dimensions* for complete fume hood dimensions.

Refer to *Appendix C: Protector Radioisotope Specifications* for complete laboratory fume hood electrical and environmental conditions, specifications and requirements.

Location Requirements



The fume hood should be located away from traffic patterns, doors, windows, fans, ventilation registers, and any other air-handling device that could disrupt its airflow patterns. All windows in the room should be closed.

La hotte aspirante devrait être localisé loin des voies de circulation, des portes, des fenêtres, des ventilateurs, des bouches de ventilation, et de tout appareil qui pourrait interrompre ses voies de flux d'air. Toutes les fenêtres dans la pièce devraient être fermées.

Support Requirements



DO NOT install the fume hood on a cart, dolly, or mobile bench. ALL Protector Hood installations must be permanent and stationary. The supporting structure usually consists of a base cabinet and chemically resistant work surface.

NE PAS installer la hotte aspirante sur un chariot ou un banc mobile. TOUTES les installations de la Hotte Protecteur doivent être permanentes et fixes. La structure de soutien consiste habituellement en un meuble doté d'une surface de travail chimiquement résistante.

Exhaust Requirements

The exhaust duct connection has been designed for 11" nominal duct (11.00" OD) to allow for minimum static pressure loss while operating at 100 fpm face velocities. The 11" diameter exhaust duct also allows for proper transport velocities away from the hood in the 1000 fpm to 2500 fpm range. The exhaust duct used in conjunction with the Radioisotope Fume Hood should be fabricated out of Type I, unplasticized PVC or Type 304 stainless steel. The proper exhaust volume and static pressure loss are listed next for each hood model:

Chapter 2: Prerequisites

Airflows and Static Pressure

Hood Type	Face		Eco Energy Saving Air Foil			
	Velocity (fpm)		Airflow Volumetric Rate (CFM) @			
	Sash at Full open at 28"	Sash at 62.5% open at 18"	Static Pressure (inches of water)			
Stainless Hoods			4' Hood	5' Hood	6' Hood	8' Hood
Perchloric and Radioisotope	125	200	905, 0.39"	1195, 0.52"	1475, 0.78"	2050, 0.44"
11" OD Exhaust	100	160	725, 0.25"	955, 0.33"	1180, 0.50"	1640, 0.28"
	N/A	125	565, 0.15"	745, 0.20"	920, 0.31"	1280, 0.17"
	N/A	100	455, 0.10"	595, 0.13"	740, 0.20"	1025, 0.11"

Recommendations highlighted

Proper Radioisotope blower selection can be determined from these exhaust requirements and the total system static pressure loss. Contact Labconco Customer Service for assistance in sizing a blower system. Refer to *Appendix F: VAV Open Area Guidelines* to properly assess the fume hood area opening, allowing the variable air volume (VAV) mechanical system to be programmed at various sash positions.

Filter Pack Requirements

Contact your local EPA or NRC office to determine if exhaust filtration is required. If required, these filter packs should be located as close as possible to the hood to expose as little of the ductwork system as possible to the radiochemicals being filtered. Consult your Safety Officer directly for specific filter ratings on radiochemicals being used.

Electrical Requirements

The Protector Hood models feature internal wiring for the LED light assembly and light switch. All internal wiring is terminated at the single point wiring junction box for hook-up by a qualified electrician. The blower switch, and light switch wires are also terminated at the single point wiring junction box for hook-up by a qualified electrician. Refer to *Chapter 3: Getting Started* and *Appendix C: Protector Radioisotope Specifications* for the wiring diagram for proper electrical installation.

Les modèles Protège-capot disposent câblage interne pour l'ensemble de la lumière LED et l'interrupteur de la lumière. Tout le câblage interne est terminé à la boîte de jonction de câbles à un seul point de raccordement par un électricien qualifié. L'interrupteur de la soufflerie, et fils de l'interrupteur de lumière sont également mis fin à la boîte de jonction de câbles à un seul point de raccordement par un électricien qualifié. Reportez-vous au Chapitre 3: Mise en route et à

l'Annexe C: Protector radio-isotopes Spécifications pour le schéma de câblage pour l'installation électrique appropriée.

Service Line Requirements

All service lines to the laboratory fume hood should be ¼ inch outside diameter, copper (brass for natural gas), and equipped with an easily accessible shut-off valve, should disconnection be required. Recommended operating pressure is 40 PSI, with a maximum allowable pressure of 200 PSI. Consider a pressure regulator to reduce line pressure to 40 PSI. Please check with local codes for other requirements.

Space Requirements

The dimensions for the different models are shown in *Appendix B: Protector Radioisotope Dimensions*.

CHAPTER 3

GETTING STARTED

Now that the site for your laboratory fume hood is properly prepared, you are ready to unpack, inspect, install, and certify your unit. Read this chapter to learn how to:

- Unpack and move your Protector Radioisotope Hood.
- Set up the fume hood with the supporting structure and hardboard work top.
- Connect to an exhaust system suitable for radiochemicals.
- Connect the optional filter packs to the exhaust system (not sold through Labconco).
- Connect the electrical supply source.
- Connect the service lines.
- Arrange certification of your Protector Radioisotope Hood.

Depending upon which model you are installing, you may need common plumbing and electrical installation tools in addition to 5/16", 3/8", 7/16", and 1/2" wrenches, ratchets, sockets, a nut driver set, a flat-blade screwdriver, a Phillips screwdriver, and a carpenter level to complete the instructions in the chapter.



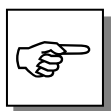
The Protector Radioisotope Hood models weigh between 400 to 800 lbs. (182-363 kg). The shipping skid allows for lifting with a mechanical lift truck or floor jack. If you must lift the fume hood manually, follow safe-lifting guidelines. Normally, the fume hood can be slid off a hydraulic lift table and be placed into position on top of the work surface. Do not lift by the front air foil.

Les modèles Protège-capot radio-isotopes pèsent entre 400 à 800 livres. (182 à 363 kg). La palette bois d'envoi permet le soulèvement par un camion muni d'un élévateur mécanique ou par un cric rouleux. Si vous devez soulever manuellement la hotte aspirante, respectez les règles de sécurité du soulèvement.

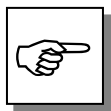
Normalement, la hotte aspirante peut être glissée d'une table munie d'un élévateur hydraulique et être placée en position sur la surface de travail. Ne pas soulever par l'écoulement d'air du devant.

Unpacking Your Fume Hood

Carefully remove the shrink-wrap or carton on your fume hood and inspect it for damage that may have occurred in transit. If your unit is damaged, notify the delivery carrier immediately and retain the entire shipment intact for inspection by the carrier.



DO NOT RETURN GOODS WITHOUT THE PRIOR AUTHORIZATION OF LABCONCO. UNAUTHORIZED RETURNS WILL NOT BE ACCEPTED.



IF YOUR HOOD 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.

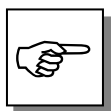
Do not discard the shipping skid or packing material for your fume hood until you have checked all of the components and installed and tested the unit. **The Perchloric Acid fume hood baffle is installed as shown in Figure 1-1.** Do not remove the fume hood from its shipping skid until it is ready to be placed into its final location. Move the unit by placing a flat, low dolly under the shipping skid, or by using a floor jack.



Do not move the hood by tilting it onto a hand truck.

Ne pas déplacer la hotte en le penchant sur un diable.

Removing the Shipping Skid



LEAVE THE FUME HOOD ATTACHED TO ITS SHIPPING SKID UNTIL IT IS AS CLOSE TO ITS FINAL LOCATION AS POSSIBLE. MOVE THE HOOD BY USING A SUITABLE FLOOR JACK, OR BY PLACING A FURNITURE DOLLY UNDERNEATH THE SKID. **DO NOT** MOVE THE HOOD BY TILTING IT ONTO A HAND TRUCK.

After you verify the fume hood components, move your hood to the location where you want to install it. Follow the steps listed next to remove the shipping skid from your unit.

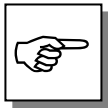
1. Remove the side panels by unscrewing the Phillips screws.

Chapter 3: Getting Started

2. Find the hardware (bolts, washers, nuts) that attach the fume hood to the skid and remove the hardware. Some hardware is on the sides and some is on the back.

Sash Weight Release

To protect the fume hood from damage in shipment, the sash weight has been secured to the back of the fume hood with screws. Simply remove the screws and make sure the sash cables or chains are on the pulleys or sprockets before operation of the sash.



NOTE: THE SASH WEIGHT ITSELF WAS INDIVIDUALLY MATCHED FOR THIS SPECIFIC HOOD AND SHOULD NOT BE EXCHANGED ON ANY OTHER UNIT.

Installing the Hood on a Supporting Structure and Hardboard Work Top



The Protector Hood is heavy! Use caution when lifting or moving the unit.

La Hotte Protecteur est lourde ! Prudence en soulevant ou en déplaçant l'objet.

When installing the Protector Radioisotope Hood onto the lower hardboard work top, ensure that the structure can safely support the combined weight of the fume hood and any related equipment. **The hardboard work top is aligned flush with the back of the fume hood for good airflow: this will provide the correct spacing under the air foil for proper bypass airflow. The lower base cabinets are placed flush with the front of the hardboard work top as shown in Figure 3-2. The hardboard work top supports the Radioisotope Hood.**



WARNING: It is important to support the rear of the work surface and fume hood. The cross support provides support for the bottom of the work surface. Install the cross support after the base cabinets and work surface are leveled and before installing the hood.

AVERTISSEMENT : Il est important de soutenir l'arrière de la surface de travail et la hotte aspirante. Le support transversal soutient le bas de la surface de travail. Installer le support transversal après que les meubles et la surface de travail soient nivelés et avant d'installer la hotte.

The following are instructions for mounting a cross support:

1. Level the base cabinets and the hardboard work top. Work top should be placed flush with the back of the fume hood as shown in Figure 3-1.
2. Scribe a line on the wall or back of the base cabinet to locate the support under the work surface.
3. Mount the support by attaching it to the wall or base cabinet.
4. Anchor cabinet(s) with seismic restraints if required by the local code in your area.

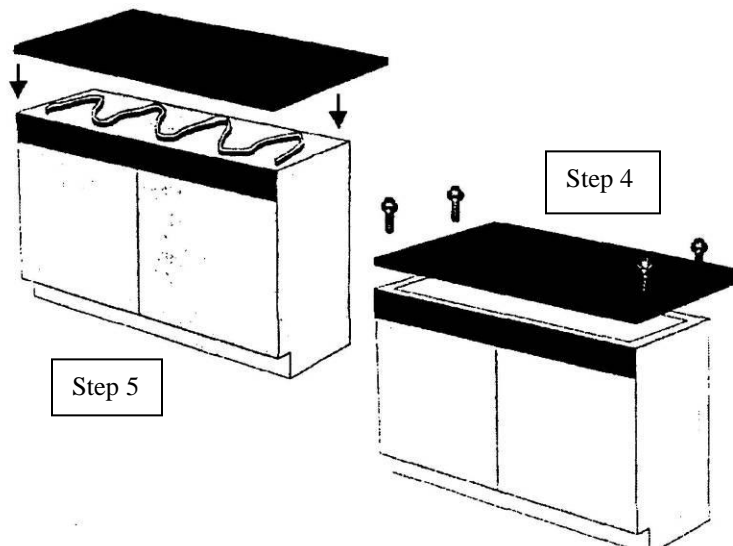


Figure 3-1

5. Secure the hardboard surface to the top of the base cabinet(s) using adhesives with the Storage Cabinet(s). Be sure the Radioisotope Hood drain trough is accounted for in the relief area of the hardboard top. See figure 3-2.
6. After completing step 5, apply a sufficient quantity of adhesive to the top surface of the hardboard.
7. Place the hood on top of the work surface and cross support.
8. Place heavy weights on the inside of the fume hood for approximately 24 hours. This provides a proper bond of the adhesive. Protect the hood's integral work surface from possible damage by wrapping any weighted material first.
9. Place the hood on top of the work top and cross support.

Chapter 3: Getting Started

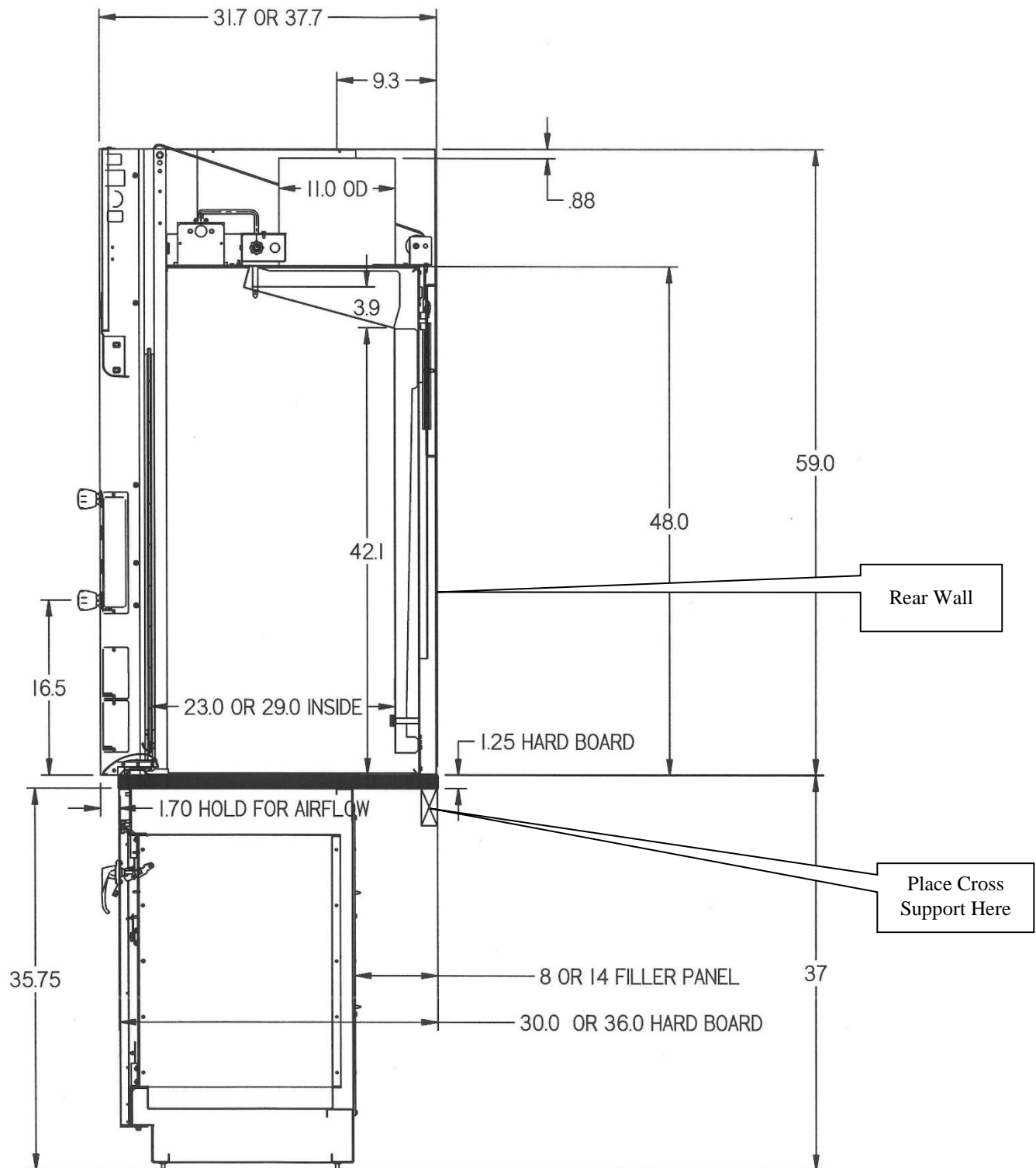


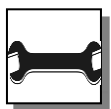
Figure 3-2

Connecting to the Hood Exhaust System



WARNING: The weight of the exhaust ductwork system must be supported independently of the hood superstructure. Do not allow this weight to be supported by the hood structure as damage to the hood may occur.

AVERTISSEMENT : Le poids du système d'aspiration de ductwork doit être soutenu d'une manière indépendante de la superstructure de la hotte. Au cas où ce poids est supporté par la structure de la hotte, des dommages à la hotte peuvent arriver.



The exhaust connection should be installed by a qualified HVAC contractor. The exhaust connection on your hood is manufactured with 11" Stainless Steel Type 304 nominal pipe (11.00" OD) to allow for minimum static pressure loss with proper transport velocities away from the hood. Consult Labconco Customer Service should you require help sizing your blower for the exhaust volume and total system static pressure loss.

La connexion d'échappement doit être installée par un entrepreneur HVAC qualifié. La connexion d'échappement sur votre hotte est fabriquée avec 11 "d'acier de type 304 diamètre nominal inoxydable (11.00" OD) pour permettre une perte de pression statique minimale avec des vitesses de transport appropriées s'écarter de la hotte. Consultez Labconco Service à la clientèle si vous avez besoin d'aide pour le dimensionnement de votre ventilateur pour le volume de gaz d'échappement et la perte totale de pression statique.



The selected exhaust duct material must be fabricated out of type 1 unplasticized polyvinyl chloride or type 304 stainless steel material. The duct should be fully welded in the case of the stainless steel material or solvent bonded in the case of polyvinyl chloride so that it does not have any cracks or holes to allow for the collection of radiochemicals.

Le matériau de conduit d'évacuation sélectionné doit être fabriquée sur une polychlorure de vinyle non plastifié de type ou d'un matériau en acier inoxydable de type 304. Le conduit doit être soudé dans le cas de l'acier inoxydable ou du solvant collé dans le cas du polychlorure de vinyle pour qu'il ne possède pas de fissures ou de trous pour permettre la collecte de radiochimiques.

Connecting to the Optional Filter Packs

Both HEPA (High Efficiency Particulate Air) and activated carbon filter pack assemblies are available for use with the Protector Radioisotope Hood. Please contact your local EPA or NRC office for manufacturers of exhaust filters appropriate for use with radio-chemicals. The HEPA filter assembly can be used to remove most particulate forms of radio-chemicals being used today. The activated carbon filter is used in the removal of gaseous form radiochemicals and can be used in conjunction with the HEPA filter, depending on the materials being used inside the fume hood. The filters themselves should be located as close as possible to the hood to expose as little of the ductwork system as possible to the radiochemicals being used. Consult your company Safety Officer directly for specific filter ratings on radiochemicals being used.



IMPORTANT WARNING: Used filters contain hazardous material. Observe all federal, state and local EPA regulations for their handling and disposal.

AVERTISSEMENT IMPORTANT: Les filtres usagés contiennent des matières dangereuses. Respectez tous les règlements de l'EPA fédérales, étatiques et locales pour leur manipulation et l'élimination.

Connecting the Electrical Supply Source to the Protector Fume Hood

Prior to connecting any electrical wiring to the fume hood structure, refer to the hood identification plate for the proper electrical requirements of your specific model.




WARNING: The building electrical supply system for Protector Hoods is required to include overload protection. A switch or circuit breaker shall be in close proximity to the equipment and within easy reach of the operator. The switch or circuit breaker is to be marked as the disconnecting device for the equipment.

AVERTISSEMENT : Le système d'alimentation électrique de la Hotte Protecteur doit inclure la protection contre la surcharge. Un commutateur ou disjoncteur doit être tout près de l'équipement et à portée facile de l'opérateur. Le commutateur ou le disjoncteur doit être marqué comme l'appareil débranchant pour l'équipement.

The identification plate, model number, serial number, and electrical connection boxes are accessible from the front of the fume hood by removing the front panel.

The Protector Radioisotope Hood is normally wired for 115 Volt, 50/60 Hz, 20 Amp or 230Volt, 50/60 Hz, 10 Amp electrical service. Check the I.D. plate behind the front panel for voltage verification. The number of circuits varies depending on the model. All of the electrical connections are terminated at the field wiring terminal box for hook-up by a qualified electrician. We recommend each circuit be a dedicated branch circuit. However, if wired together the maximum load allowed is the sum of individual outlets plus the rating of the unit (i.e. 2 Amps remote, 8 Amps integral blower) not to exceed the 10A or 20A electrical service. The single point internal junction box is used for the connection of the lights, blower, and duplex outlets. Refer to the wiring diagram for your Protector Radioisotope in *Appendix C: Protector Radioisotope Specifications*.

The fume hood is required to be grounded to the MAINS protective earthing ground for safe operation. Using a ring terminal sized for a 10-24 machine screw, connect the MAINS ground conductor to the grounding lug marked with the protective earthing symbol, . Only MAINS ground conductors should be connected to the protective earthing ground lug, no other conductors should be connected to this grounding lug. Using wire nuts connect the MAINS supply conductors to the fume hood supply wires. Insure that the wires are connected as per the appropriate wire color codes for the input voltage. For 115V Phase (Hot) is black and Neutral is white, for 230V Phase1 is brown and Phase2 is blue. Refer to the wiring diagram for your Protector Radioisotope in *Appendix C: Protector Radioisotope Specifications*.

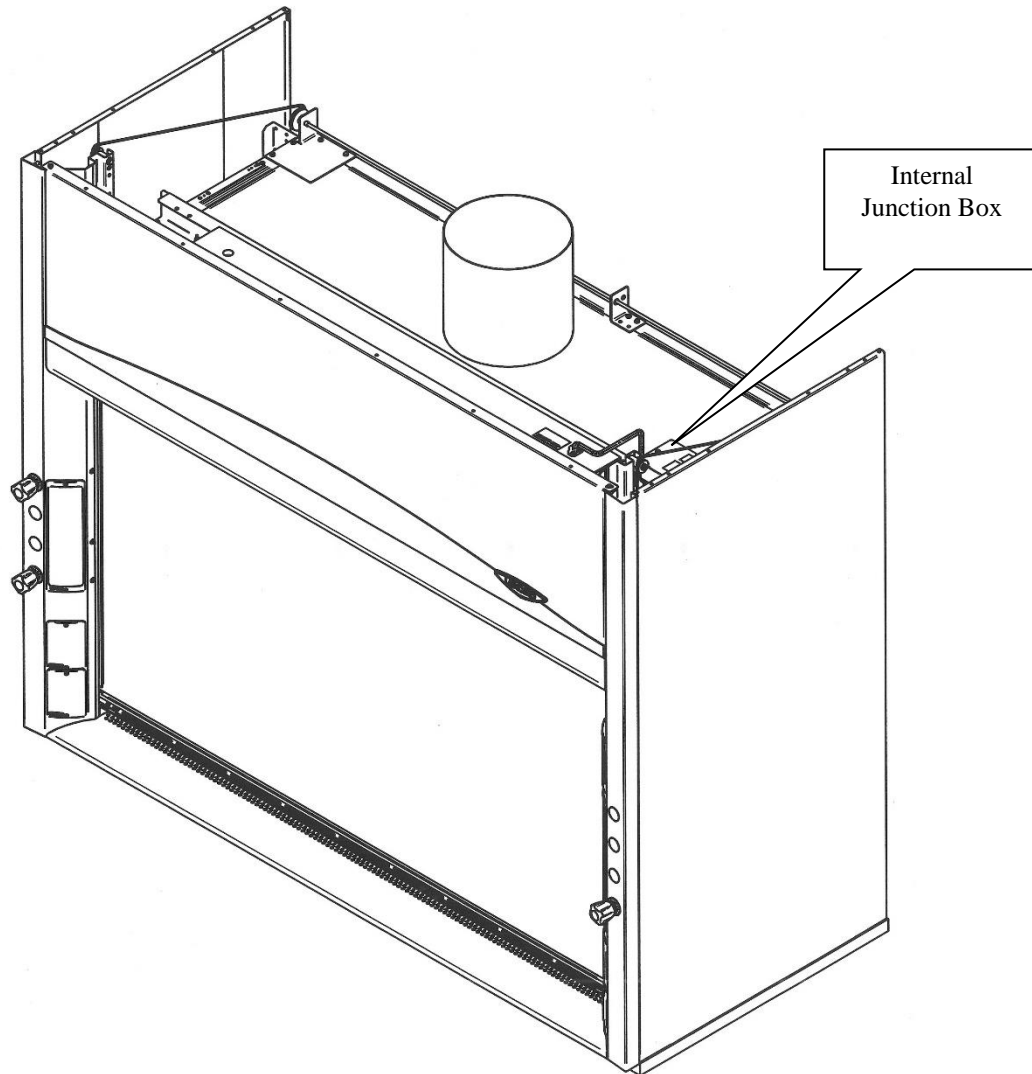


Figure 3-3



All wiring for the fume hood **SHOULD** be performed by a licensed electrician and conform to all local codes. In most cases, the hood will require the use of shielded conduit to protect the wiring into the hood. The grounding connection shall not be made to the terminal box cover.

Tout le câblage électrique pour la hotte aspirante devrait être exécuté par un électricien agréé et être conforme à tous les règles en vigueur. Dans la plupart des cas, la hotte exigera l'usage de conduit blindé pour protéger le câblage électrique dans la hotte. La prise de terre ne sera pas faite à la couverture de la boîte du terminal.

The LED light has been mounted outside the top liner panel and is sealed from vapors inside the hood structure. To change the fluorescent light bulbs in your hood, you must first remove the front panel from the hood. Next remove the knock out plugs holding the light fixture in place. Lift fixture up and replace any defective bulbs. Reverse order to reassemble.

Connecting the Service Lines to the Protector Fume Hood

The hoods with service fixtures have been plumbed from the valve to the hose connector or gooseneck for your installation convenience. Supply tubing shall be provided by the qualified installer. Tubing can enter the hood from above, through the back, or through the work surface to make these connections to the service fixtures.



NOTE: Inspect all fittings for leakage. Tighten the fittings slightly if needed.

NOTE : Inspecter toutes les installations à la recherche de fuite. Resserrer les installations légèrement si nécessaires.



CAUTION: Do not use oxygen with any standard service fixture. Contact Labconco Customer Service for oxygen fixture information.

PRUDENCE : Ne pas utiliser de l'oxygène avec l'accessoire de service standard. Contacter le Service Clientèle de Labconco pour les informations d'accessoire d'oxygène.

Should access to the hood plumbing fixture bodies be required, remove the service access plate on the hood front corner posts by loosening their individual screws (see item 11, Figure A-1 in *Appendix A*). The valve body will now be fully exposed for any service work that may be necessary. The service fixtures supplied on your laboratory hood are designed for use with the following services:

- Air
- Cold Water
- Hot Water
- Natural Gas – See caution below
- Vacuum



WARNING: Contact Labconco Customer Service directly before using any service other than those listed above in these valves to assure full compatibility.

AVERTISSEMENT : Contacter le Service Clientèle de Labconco directement avant d'utiliser n'importe quel service autre que ceux énumérés au-dessus dans ces soupapes pour assurer une pleine compatibilité.



CAUTION: Natural gas should be used only in the service fixture that has been pre-plumbed with brass tubing. Sulfur content of the gas could cause deterioration of standard copper supply lines.

PRUDENCE : Le gaz naturel devrait être seulement utilisé dans l'accessoire de service qui a été pré soudé avec des tuyaux de cuivre. Le contenu soufré du gaz pourrait causer la détérioration des lignes d'alimentation en cuivre standard.

Sealing the Protector Hood to the Work Surface

When the hood has been set in place, ducted, wired, and plumbed, it should be sealed to the hardboard work top. Materials such as silicone sealants are recommended to seal the hood structure.

Certifying the Protector Radioisotope Fume Hood

The combination of your laboratory hood, exhaust ductwork, and exhaust blower gives you the flexibility to change the airflow at the sash opening of your hood. To determine the actual face velocity at the sash opening, airflow velocity readings will need to be taken. This should be done across the sash opening of the hood in accordance with the *Industrial Ventilation Manual* section on laboratory hoods (see *Appendix E: References*). Labconco recommends an average face velocity at the sash opening of 100 feet per minute. Consult Chapter 2 for proper airflow volumes for your particular model.

Your Protector Fume Hood has been tested at the factory per ASHRAE 110-1995. All hoods achieve an “as manufactured rating” of less than 0.05 part per million (ppm) at 4 liters per minute (lpm); AM<0.05 (consult Labconco for individual fume hood ratings). For “field use” ASHRAE testing contact Labconco Sales Engineering Team or Customer Service for a certified on-site contractor.



NOTE: Face velocity profiles and smoke testing should be done periodically to ensure safe performance.

NOTE : Les profils de flux frontal et les tests de fumée devraient être régulièrement faits pour garantir une utilisation en toute sécurité.

CHAPTER 4

PERFORMANCE FEATURES AND SAFETY PRECAUTIONS

Performance Features

The Protector Radioisotope Laboratory Hood has been engineered to provide you the maximum in work area and personal safety. The by-pass air configuration on the Radioisotope Fume Hood is totally dependent on air being supplied to the hood from its surrounding environment for proper operation.

The hood itself is designed to handle radiochemical operations of all types. The hood liner should be decontaminated manually by the operator. Water washdown or flooding the surface with water is standard practice and results in about 50% reduction of contamination on the 304 stainless steel liner material. A secondary means of surface decontamination involves the use of organic solvents that can result in reductions of contamination of up to 75%.

Even though the stainless steel seams are smooth to the touch, there are microscopic voids within the surface in which radioactive particles can lodge and are not easily removed by the above mentioned surface decontamination procedures. Abrasion decontamination, which consists of sanding and/or scouring may be required to dislodge these particles from your hood liner.




Radioisotope materials are, in essence, high-energy particles with different levels of intensity. These levels are, alpha, beta, and gamma. Radioactive particles do not just simply strike a barrier and bounce off, but rather are absorbed by the barrier and physical decomposition on the molecular level can occur. In the case of the alpha and some lower level beta radiation particles, human skin can act as an effective barrier to this radiation without damage to the underlying tissues.

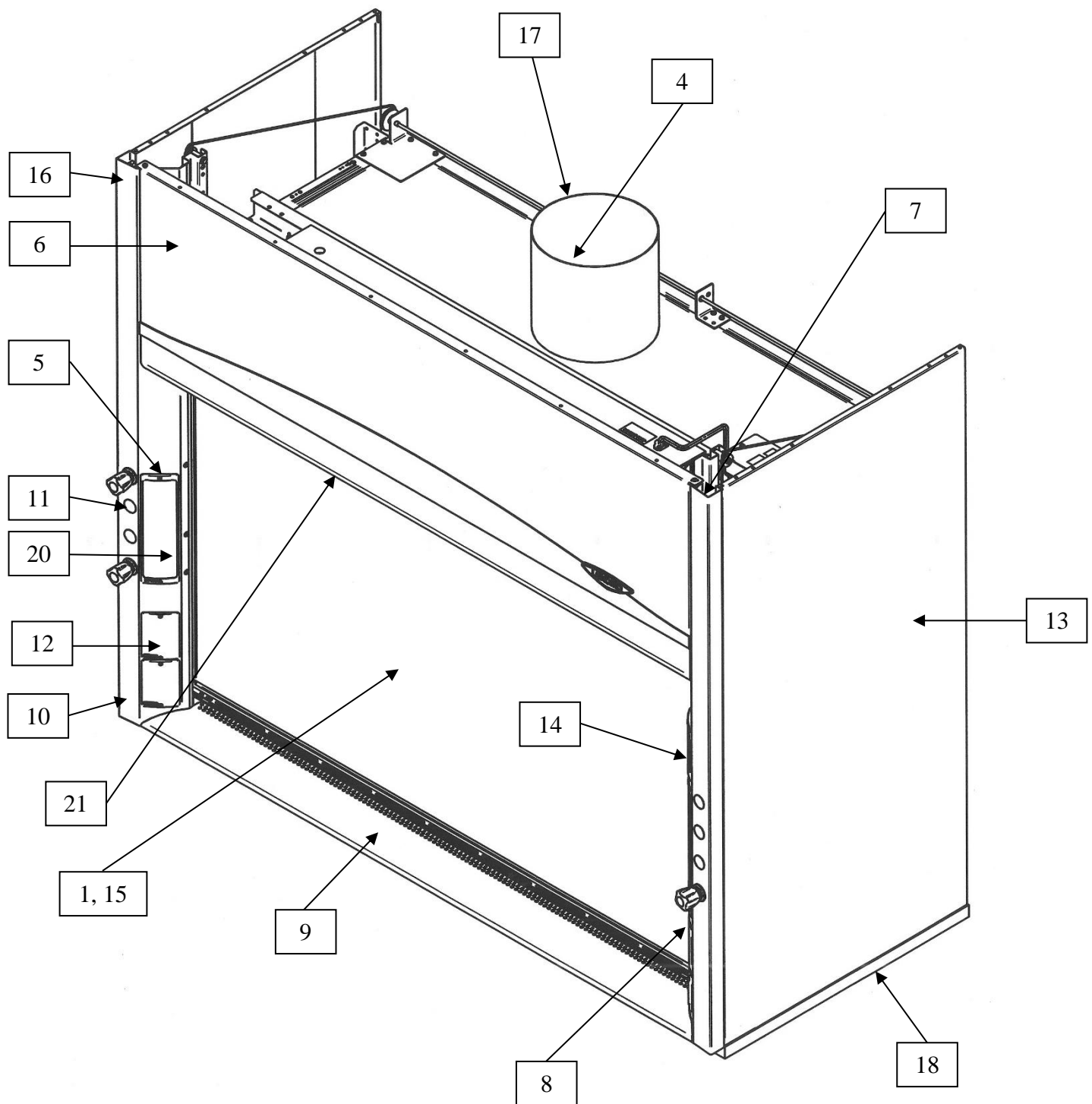
Chapter 4: Performance Features & Safety Precautions

However, in the case of inhalation, low-level emitters can attack inner organ tissues posing a health hazard. Therefore, it is very important in cases even where these low level type emitters are being used that effective sources of ventilation be provided.

The radioisotope hood's stainless steel liner material is intended for use with alpha particles, which are least hazardous, and for most beta type particles, which have a slightly higher mass and consequently feature a higher velocity requiring more shielding than the alpha particles. The gamma emitter particles have no mass but an extremely high velocity. Therefore, they are not easily absorbed and are not normally used within this hood enclosure unless it has been properly lined with lead blocks and a lead glass sash assembly. Consult with your company safety officer for additional safety procedures dealing with your specific materials, before operating this hood.

1. **Unique sash provides maximum visibility of 37.5" high while conserving energy by limiting sash travel to 28".** Vertical-rising sash may be raised from a closed to 28" operating height. Exhaust volume and blower sizing are based on the 28" height. Optional sash stops are available to limit sash height and reduce energy usage. The Perchloric Acid Hood has a glass sash specifically used for Perchloric Acid.
2. **By-pass airflow design** ensures containment as the sash moves.
3. **Large usable interior work depth and interior height of 48"** provides ample working space.
4. **Baffle** directs airflow to the rear of the interior to provide efficient airflow. The baffle may be removed for cleaning purposes only.
5. **Exterior access cover plates** are removable for easy access to plumbing valves when access through the sides is not available.
6. **Lift-Away™ front panel** provides easy access to electrical wiring, sash weights, and lighting fixtures.
7. **Energy efficient LED lighting** is located behind a laminated safety glass shield mounted to the top of the hood. The factory-wired lighting is serviceable from outside the hood cavity. Additionally, the long lasting 50,000 hour direct wired LED T8 bulbs are more energy efficient, utilizing approximately ½ the power of fluorescent bulbs. See Appendix A for wattage.
8. **Low-mounted, factory-wired light and blower switches** are ADA compliant.
9. **Clean-Sweep™** air foil allows air to sweep the work surface for maximum containment.
10. **Streamlined corner posts** provide maximum visibility and the flexibility to add services; services are most easily added at the factory, because of the PVC liner.

11. **All hoods are factory-prepared for up to 7 service fixtures.** Additional fixtures are available only as a factory special. Liner hole drilling is required to add another fixture in the field.
12. **One duplex electrical receptacle** is mounted on the right corner post. Receptacles are factory-wired to hood single point junction box. Additional electrical receptacles are available as factory or field installed.
13. **Type 304 Stainless Steel interior liner** is seamless with coved interior corners and integral work surface.
14. **Accessory Guardian™ Digital Airflow Monitor or Guardian Jr. Monitor** continuously monitors face velocity. An audio/visual alarm alerts the user to low airflow conditions. The right corner post is factory prepared to accommodate the Guardian Monitor (sold separately).
15. **Optional Energy-Reducing A-Style Combination Sash Models.** These combination sashes allow the operator to use the hood with sashes either half open vertically or horizontally to conserve energy. Optional sash stops prevent raising the vertical sash above the half-open and fully closed positions unless manually defeated by the operator.
16. **Outside frame of epoxy-coated steel and galvanized steel** is durable and corrosion resistant.
17. **Exhaust connection.** The hood features 11" (11.00" OD pipe) Type 304 Stainless Steel exhaust connections sized to allow for a minimum static pressure loss through the hood structure while providing a good transport velocity through the exhaust system.
18. **Solid hardboard support** provided to support the integral Type 316 Stainless Steel bottom.
19. **Optional Ceiling Enclosure Kits** are available for a decorative facade between the hood and the ceiling.
20. **Optional Sash Stops** provide a means of controlling the operating height of the sash.
21. **Built-in Upper Bypass.** The Radioisotope Hood includes an upper bypass block which proves to be useful when working with heat in digestions.
22.  **CAUTION** – Current rating of receptacle is specified in *Appendix D*.
AVERTIR – Classification des prises de courant est spécifié dans l'Annexe D.
23.  **CAUTION** – See Appendix C and D for complete current rating.
AVERTIR – Voir Annexe C et D pour la classification complète du courant.
24.  **CAUTION** – Flammable Gas.
AVERTIR – Gaz Inflammable.

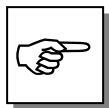
Chapter 4: Performance Features & Safety Precautions**Figure 4-1**

Safety Precautions



Although the laboratory hood has been engineered to maintain optimum operator safety, caution should always be used while working in the hood. Prior to using the hood, check to make sure that the exhaust blower is operating and that air is entering the hood at its specified face velocity.

Bien que la hotte de laboratoire ait été réglée pour maintenir la sécurité optimale de l'opérateur, la prudence devrait toujours être utilisée en travaillant sous la hotte. Avant utiliser la hotte, le contrôle pour s'assurer que la soufflerie d'aspiration fonctionne et que cet air entre dans la hotte au flux spécifié.



USE GOOD HOUSEKEEPING IN THE HOOD AT ALL TIMES. CLEAN UP SPILLS IMMEDIATELY WITH A MILD DETERGENT. PERIODICALLY CLEAN HOOD INTERIOR, INCLUDING FLUORESCENT LIGHT GLASS PANEL. REPLACE BURNED OUT LIGHT BULBS TO MAINTAIN MAXIMUM ILLUMINATION.

DO NOT OVERLOAD THE WORK SURFACE WITH APPARATUS OR WORK MATERIAL. THE SAFE OPERATION OF THE LABORATORY HOOD IS BASED UPON HAVING PROPER AIRFLOW THROUGH THE STRUCTURE. DO NOT PLACE LARGE, BULKY OBJECTS SUCH AS BLOCK HEATERS, DIRECTLY ON THE HOOD WORK SURFACE. INSTEAD, ELEVATE THE OBJECT 2" TO 3" ON BLOCKS TO ALLOW A FLOW OF AIR UNDER THE OBJECT AND INTO THE LOWER REAR BAFFLE EXHAUST SLOT. ENSURE BLOCKS ARE LEVEL AND SECURED IN PLACE.



Blocking the bottom of the baffle at the rear of hood will change the airflow pattern in the hood causing turbulence and possible leakage at the face of the hood. (Don't store containers or supplies against baffles, as this will affect airflow through the hood).

Avoid placing your head inside hood. Keep hands out of hood as much as possible.

Bloquer le fond du déflecteur à l'arrière de la hotte changera le modèle du flux d'air dans la hotte causant de la turbulence et une fuite possible devant la hotte. (Ne pas emmagasiner des récipients ou des provisions contre les déflecteurs, car ceci affectera le flux d'air à travers la hotte).

Chapter 4: Performance Features & Safety Precautions

Eviter de placer votre tête à l'intérieur de la hotte. Garder les mains à l'extérieur de la hotte le plus possible.

Always work as far back in hood as possible. It is best to keep all chemicals and apparatus 6" inside the front of the hood.

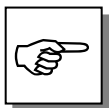
Toujours travailler aussi loin que possible de la hotte. Il est recommandé de garder tous les produits chimiques et appareils à 6 pouces à l'intérieur de l'avant de la hotte.

Perchloric acid use in Stainless Steel Radioisotope Hoods is not recommended.

L'utilisation de l'acide perchlorique en acier Hoods radio-isotopes acier n'est pas recommandée.

High-level radioisotope materials are not recommended for use in this Radioisotope hood. Only use low-level alpha and lower level beta radiochemical particulates.

Matériaux de radio-isotopes de haut niveau ne sont pas recommandés pour une utilisation dans cette hotte de radio-isotopes. N'utilisez que des alpha de faible niveau et de niveau inférieur bêta particules de radiochimique.



AVOID CROSS DRAFTS AND LIMIT TRAFFIC IN FRONT OF THE HOOD. AIR DISTURBANCES CREATED MAY DRAW FUMES OUT OF THE HOOD.



The use of heat-generating equipment in this hood without the exhaust system operating properly can cause damage to the hood.

L'usage d'équipement chaleur-produisant dans ce capuchon sans l'opération de système d'aspiration peut causer convenablement des dommages à la hotte.

The Protector Radioisotope Laboratory Hoods should be certified by a qualified certification technician before initially used. The hood should be re-certified whenever it is relocated, serviced or at least annually thereafter.

Le Protecteur du radio-isotopes hottes de laboratoire doivent être certifiés par un technicien de certification qualifié avant la première utilisation. La hotte doit être re-certifié à chaque fois qu'il est déplacé, l'entretien ou au moins chaque année par la suite.

Ensure that the hood 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 hood from electrical service. Proper operation of the fume hood depends largely upon the hood's location and the operator's work habits. Consult the *Reference Manual in Appendix D*.

Assurez-vous que le capot est connecté au service électrique conformément aux codes électriques locaux et nationaux. Ne pas le faire peut créer un risque d'incendie ou électrique. Ne pas enlever ou de réparer des composants électriques sans d'abord débrancher la hotte du service électrique. Le bon fonctionnement de la hotte dépend largement de l'emplacement de la hotte et les habitudes de travail de l'opérateur. Consultez le manuel de référence à l'Annexe D.

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.



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

Ne pas positionner la hotte de sorte qu'il est difficile de faire fonctionner le dispositif principal de déconnexion.

CHAPTER 5

USING THE PROTECTOR

RADIOISOTOPE

S

Operating the Vertical-Rising Glass Sash

Because of the Protector Radioisotope Hood's counterbalanced sash mechanism, it will take only a few pounds of force to move the sash up or down, and you can operate the sash smoothly with one or two hands positioned anywhere along the handle. The glass sash is suitable for use with Perchloric acid. The vertical-rising sash may be raised to a maximum 28" operating height. The airflow requirements should be sized for the 28" operating height; if using sash stops then the airflow requirements can be reduced by approximately 40% at 18" or approximately 50% at 15".

S

Operating the Blower

Your Protector Fume Hood utilizes a remote style blower, which can be activated by turning the blower switch to "ON." You can validate the hood performance by watching smoke drawn into the hood face opening.

S

Operating the Lights

Your Protector Fume Hood utilizes a factory-wired LED light to illuminate the hood interior (see Appendix A). Simply turn the light switch to "ON" to operate.

S

Operating the Washdown Control Valve

Your Protector Radioisotope Fume Hood has a washdown control valve located on the upper left-hand side that controls water to the washdown spray nozzles. The nozzles are located behind the hood baffle and will washdown areas in the hood, which are inaccessible without removing the baffle. The washdown control system can also be set up to control the washdown rings used in your exhaust ductwork. This is done by connecting the water line to the plugged connection on top of the washdown hood system or ordering additional washdown valves found in Chapter 2 and Chapter 7.

Working in Your Protector Radioisotope Fume Hood

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 hood is in use.

Start-up

Labconco follows the recommendations of the American National Standard Institute with regards to fume hood exhaust systems. A full list of requirements can be found in the ANSI Standard No. Z9.5 *Laboratory Ventilation*. If you are unsure of the proper use of the exhaust blower for your fume hood, contact your safety officer or industrial hygienist before making any modifications to the blower's operational status (on/off/low, etc.). Keeping the exhaust system under constant negative pressure is an excellent way to ensure hazardous fumes in the fume hood do not enter the laboratory space inadvertently.

- Turn on the light.
- Slowly raise the sash and verify the fume hood has proper airflow.
- Check the baffle air slots for obstructions.
- Allow the hood to operate unobstructed for two minutes.
- Wear a long sleeved lab coat and rubber gloves. Use protective eyewear. Wear a protective mask if appropriate.

Loading Materials and Equipment

- Only load the materials required for the procedure. Do not overload the hood.
- High-level radioisotope materials (gamma particles) are not recommended for use in this Radioisotope Hood. Only use low-level alpha, lower level beta radioactive particles, and gaseous radioisotopes. Consult your Safety Officer should you have any questions.
- Do not obstruct the front air foil (sill), or rear baffle slots.

Chapter 5: Using the Protector Radioisotope

- Large objects should not be placed close together and spaced above the liner bottom to permit airflow to sweep under the equipment.
- After loading the hood, wait one minute to purge airborne contaminants from the work area.

Work Techniques

- Keep all materials at least 6 inches inside of the sash and at least two inches from the side walls and perform all contaminated operations as far to the rear of the work area as possible.
- Keep all clean and contaminated materials in the work area separate for clear identification.
- Avoid using techniques or procedures that disrupt the airflow patterns of the hood.

Final Purging

- Upon completion of the work, the hood should be allowed to operate for two minutes undisturbed, to purge airborne contaminants from the work area before closing the sash.

Unloading Materials and Equipment

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

Final Decontamination

- Water washdown or flooding the surfaces with water is standard practice and results in about 50% reduction of contamination on the 304 stainless steel liner material due to radiochemicals.
- A secondary means of surface decontamination involves the use of organic solvents that can result in up to 75% reduction of contamination due to radiochemicals.
- Even though 304 stainless steel seams are smooth to the touch, there are microscopic voids within the surface in which radioactive particles can lodge and are not easily removed except by abrasion decontamination. Abrasion decontamination consists of sanding and/or scouring operations to dislodge radioactive particles from the stainless steel hood liner.

Shutdown

- Only turn off the light and close the sash if final washdown is complete.

CHAPTER 6

MAINTAINING THE PROTECTOR

RADIOISOTOPE

Now that you have an understanding of how to work in the fume hood, we will review the suggested maintenance schedule and the common service operations necessary to maintain your fume hood for peak performance.

Service Safety Precautions

- If performing any electrical maintenance, always disconnect the power at the main disconnect.
- If performing decontamination inside the fume hood, consult your safety officer for proper personal protective equipment and procedure.
- Since some service operations require a step ladder, always use proper safety and consult your safety officer
- If performing maintenance on any service lines, always shut off the supply first.
- Some removable components may be heavy, follow safe-lifting guidelines.
- Verify all components are installed correctly with performance verified before conducting normal operations.

Précautions de Sécurité pour l'Entretien

- Lors de l'entretien électrique, toujours débrancher le courant du secteur principal.
- Durant la décontamination sous la hotte d'aspiration, consulter votre responsable de sécurité pour le correct équipement de protection du personnel et la procédure.

Chapter 6: Maintaining the Protector Radioisotope

- Puisque certaines opérations d'entretien exigent plusieurs étapes, toujours utiliser la correcte sécurité et consulter votre responsable de sécurité
- Lors de l'entretien sur n'importe quelles lignes de secteur, toujours éteindre premièrement l'alimentation.
- Quelques composants détachables peuvent être lourds, respecter les règles de sécurité du soulèvement.
- Vérifier tous les composants sont correctement installés avec un fonctionnement vérifié avant de faire des opérations normales.

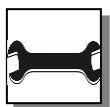


- **Only trained and experienced certification technicians should perform some of the service operations after the fume hood has been properly decontaminated. DO NOT attempt to perform these operations if you are not properly trained. The wrench icon precedes the service operations that require qualified technicians.**
- **Seulement les techniciens de certification expérimentés et entraînés devraient exécuter certaines des opérations d'entretien après que la hotte d'aspiration ait été convenablement décontaminée. NE PAS tenter d'exécuter ces opérations si vous n'êtes pas convenablement entraîné. L'icône de clé plate précède les opérations d'entretien qui exigent des techniciens qualifiés.**

Routine Maintenance Schedule

Weekly

- Using ordinary dish soap to clean the surface inside of the fume hood, and the work surface.
- Using an appropriate glass cleaner, clean the sash and all glass surfaces.
- Operate the fume hood blower, noting the airflow velocity through the hood using a source of visible smoke.
- Decontaminate 304 stainless steel surfaces (if used daily) from radiochemicals as outlined in Chapter 5 Final Decontamination.



Monthly (or more often as required)

Mensuellement (ou plus régulièrement si nécessaire)

- Determine the actual face velocity through the sash opening of the hood where the average reading should be at the specified velocity. (Use calibrated thermal anemometer or other approved apparatus).
- Déterminer l'actuel flux d'aspiration à travers le sas d'entrée de la hotte où la valeur moyenne doit être égale à la valeur spécifiée. (Utiliser un anémomètre thermique calibré ou d'autres appareils approuvés).
- Using a damp cloth, clean the exterior surfaces of the hood, particularly the front of the hood, to remove any accumulated dust.
- En utilisant un chiffon humidifié, nettoyer les parties extérieures de la hotte, en particulier le devant de la hotte pour enlever la poussière accumulée.
- Check all service valves, if so equipped, for proper operation.

- Contrôler toutes les soupapes, si présentes, pour le bon fonctionnement.
- The hood baffles should be checked for blockages behind them to ensure that the hood is maintaining proper airflow.
- Les déflecteurs de hotte devraient être contrôlés pour leur blocage arrière afin d'assurer que la hotte maintient un flux d'air correct.
- All weekly activities.
- Toutes les activités hebdomadaires.



Annually **Annuellement**

- Replace the lamps, if needed.
- Remplacer les lampes, si nécessaire.
- Have the fume hood recertified by a qualified certification technician. See “Certifying the Protector Fume Hood” in *Chapter 3*.
- Recertifier la hotte aspirante par un technicien agréé en certification. Voir au Chapitre 3 « Certifier la Hotte Aspirante Protecteur ».
- All monthly activities.
- Toutes les activités mensuelles.

Biannually

- The sash assembly should be checked to ensure proper operation and to make sure there are no signs of abnormal wear on the sash pulleys, cables and clamps.

Routine Service Operations

Front Panel Removal:

1. Simply lift the front panel up and then away from the hood to provide access to the top.



Changing the Lamp:

1. Turn light switch to “OFF”.
2. Remove the front panel as noted earlier.
3. Reach over the front header of the hood and remove knock out plugs at both ends of fixture. Lift fixture up.
4. Remove the lamp by pushing it out of the spring-loaded lamp socket and swinging it out of the other lamp socket.
5. Install the new lamp by reversing the removal procedure.

CHAPTER 7

MODIFYING THE PROTECTOR

RADIOISOTOPE

There are several ways to modify the fume hood for your individual requirements. These include the addition of work tops, service fixtures, air monitor, electrical duplex outlets, ceiling enclosures, and rear panels.



Installing Hardboard Support Surface

Your Protector Radioisotope Fume Hood requires a hardboard support surface to properly support the integral work surface of the one-piece stainless steel liner. The hardboard support is shipped and included with the Radioisotope Fume Hood. Be sure to secure the hardboard support per the instructions in Chapter 3.



Installing Ceiling Enclosures Above the Fume Hood

Your Protector Fume Hood has mounting holes to accept a ceiling enclosure to close off the area between the top of the hood and the ceiling. Contact Labconco Customer Service for ordering information. Labconco offers both non-adjustable fixed height ceiling enclosures as well as adjustable height ceiling enclosures per the charts below. Other special sizes are available upon request.

3-Sided Ceiling Enclosure Kits

The panels extend above the top of the hood to the ceiling to hide exposed ductwork, plumbing and wiring. For any 3 ft to 8 ft Protector XL Benchtop, Premier, XStream, Stainless Steel or PVC Fume Hood. Each kit includes three glacier white powder-coated steel ceiling enclosure panels, one for the front of the hood and one for each side of the hood.

Configure Your Non-Adjustable Fixed Height Ceiling Enclosure Kit Catalog Number

Use this key to configure the seven digit catalog number to order your 3-Sided **Fixed Height** Ceiling Enclosure Kit. For example, **9550501** is a 3-Sided Ceiling Enclosure Kit for a 5' x 31.7" deep Protector Stainless Steel Radioisotope Hood with a fixed height of 12".

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0

STEP 1. Select the **nominal width** of your fume hood. This number is the fifth digit of your catalog number.

3 = 3' (XL Benchtop only)

4 = 4'

5 = 5'

6 = 6'

7 = 7' (XL Benchtop only)

8 = 8'

STEP 2. Select the **depth** based on the model chosen. Choose 0 for Premier and 1 for XStream. Choose 1 for PVC. Choose 0, 1 or 2 for the correct depth of the XL Benchtop model. Choose 0 or 1 for the correct depth of Stainless Steel. This is the sixth digit of your catalog number.

No.	Ext. Depth	Model
0	31.7"	Premier, XL Benchtop, Stainless Steel
1	37.7"	XStream, XL Benchtop, XL Floor-Mounted, Stainless Steel, PVC
2	43.7"	XL Benchtop, XL Floor-Mounted

STEP 3. Choose the correct **height** that matches the number. This height should match the height between the top of the hood and the building ceiling. This is the seventh digit of your catalog number.

No.	Height
0	6"
1	12"
2	18"
3	24"
4	30"
5	36"

Chapter 7: Modifying the Protector Radioisotope

Configure Your Adjustable Height Ceiling Enclosure Kit Catalog Number

Use this key to configure the seven digit catalog number to order your 3-Sided **Adjustable Height** Ceiling Enclosure Kit. For example, **9425501** is a 3-Sided Ceiling Enclosure Kit for a 5' x 31.7" deep Protector Stainless Steel Radioisotope Hood with a height range of 14-19".

9 **4** **2** **5**

STEP 1. Select the **nominal width** of your fume hood. This number is the fifth digit of your catalog number.

3 = 3' (XL Benchtop only)
4 = 4'
5 = 5'
6 = 6'
7 = 7' (XL Benchtop only)
8 = 8'

STEP 2. Select the **depth** based on the model chosen. Choose 0 for Premier and 1 for XStream. Choose 1 for PVC. Choose 0, 1 or 2 for the correct depth of the XL Benchtop model. Choose 0 or 1 for the correct depth of Stainless Steel. This is the sixth digit of your catalog number.

No.	Ext. Depth	Model
0	31.7"	Premier, XL Benchtop, Stainless Steel
1	37.7"	XStream, XL Benchtop, XL Floor-Mounted, Stainless Steel, PVC
2	43.7"	XL Benchtop, XL Floor-Mounted

STEP 3. Choose the correct **height range** that matches the number. This height range should match the height between the top of the hood and the building ceiling. This is the seventh digit of your catalog number.

No.	Height Range
0	11-14"
1	14-18.6"
2	18.6-24.4"

Note: The previous generation listed as 9414-W-D-H is presented below to aid product service.

9 **4** **1** **4** **W** **D** **H**

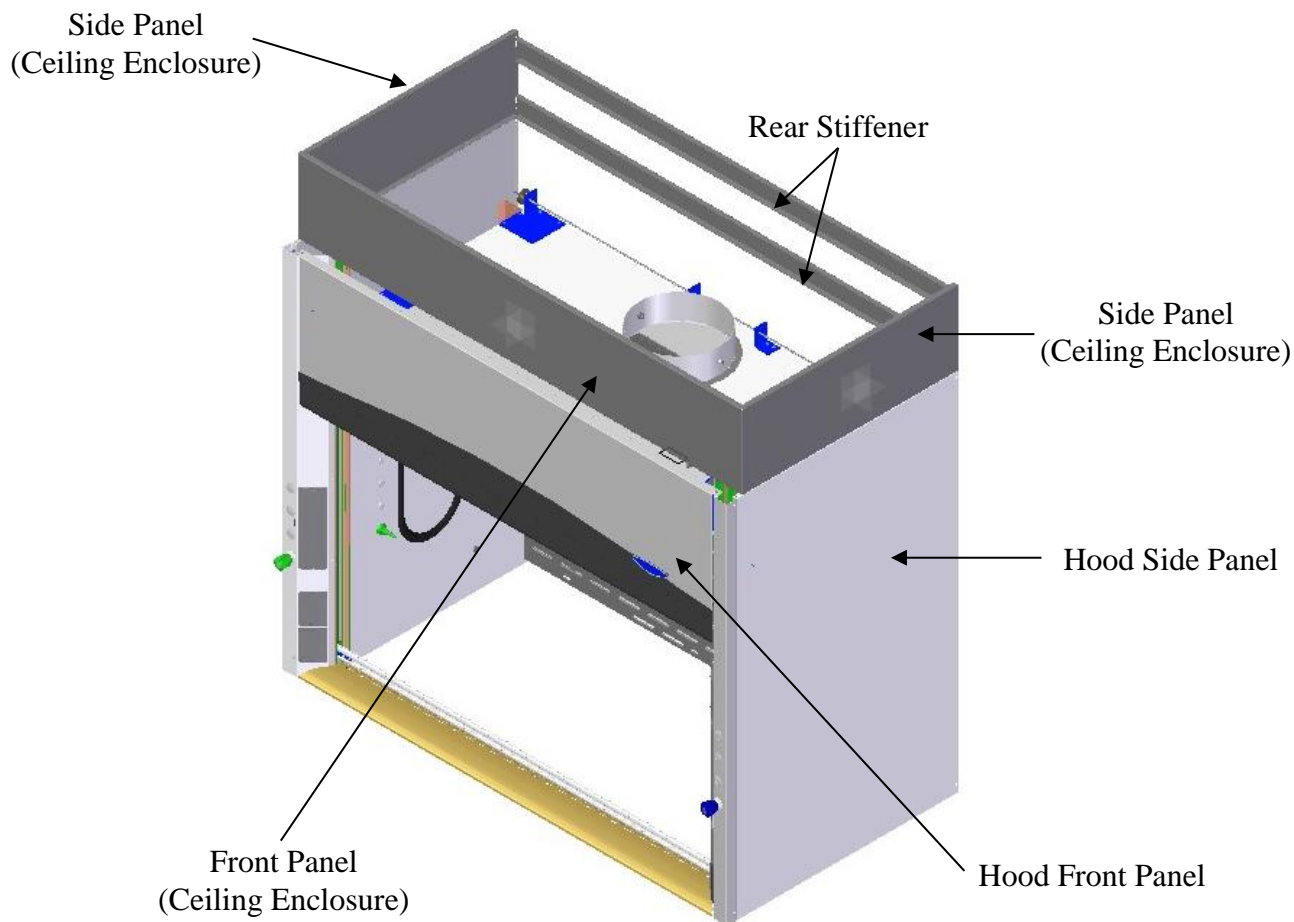
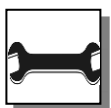
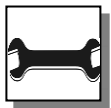


Figure 7-1



Installing Rear Panels Behind the Fume Hood

Your Protector Fume Hood can be modified to add a rear panel behind the fume hood when the fume hood is placed on an island (not available on Pass-Through Fume Hood). Contact Labconco Customer Service for ordering information.



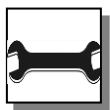
Installing Guardian™ Digital Airflow Monitor or Guardian™ Airflow Monitor

The Guardian Airflow Monitors continuously monitor face velocity through the fume hood opening. The fume hood right corner post is factory prepared to mount either monitor. Contact Labconco Customer Service to order.



Sash Stop Kit – Field Installation (P/N 9410300)

The sash stop kit restricts how far a vertical-rising sash may be opened. This small plastic device may be easily field installed on the fixture corner post of any fume hood.



Installing an Electrical Duplex Outlet

Your Protector Fume Hood can be ordered with duplex outlets, however, if you ordered a model without an electrical duplex outlet you can have one installed in the field by a qualified electrician. Contact Labconco Customer Service for ordering information. (Not acceptable on explosion-proof hoods).

Votre Protège-capot de fumées peut être commandé avec prises doubles, cependant, si vous avez commandé un modèle sans prise de courant duplex, vous pouvez en faire installer sur le terrain par un électricien qualifié. Contactez le service clientèle Labconco pour commander. (Non acceptable sur antidéflagrants hottes).

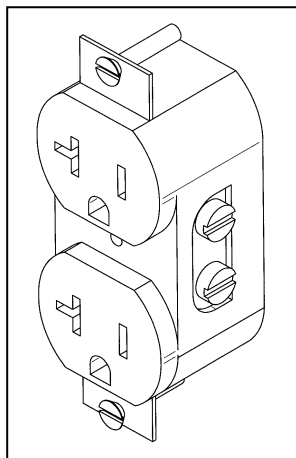


Figure 7-2

CHAPTER 8

TROUBLESHOOTING

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

PROBLEM	CAUSE	CORRECTIVE ACTION
Remote blower and lights won't operate	Wires not connected at junction boxes or switches.	Check connection of switches.
		Check connection to control box on top of unit.
	Circuit breakers tripped in building electrical supply.	Reset circuit breakers.
Remote blower won't operate, but lights work	Blower wiring is disconnected.	Inspect blower wiring and switch.
	Belt broken.	Replace belt.
	Blower motor is defective.	Replace blower motor.
Fume hood blower operates but lights will not operate	Lamp not installed correctly.	Inspect lamp installation.
	Lamp is defective.	Replace lamp.
	Lamp circuit breaker in building is tripped.	Reset the lamp circuit breaker.

Chapter 8: Troubleshooting

PROBLEM	CAUSE	CORRECTIVE ACTION
Fume hood blower operates but lights will not operate	Lamp wiring is disconnected.	Inspect lamp wiring.
	Defective lamp ballasts.	Replace lamp ballasts.
Contaminants escape outside of fume hood	Improper user techniques for the fume hood.	See “Certifying the Hood” Chapter 3 and “Safety Precautions” Chapter 4 sections in the manual. (Ref. Appendix D).
	Restriction of the baffle air slots or – blockage of the exhaust outlet.	Remove baffles to ensure that all air slots and the exhaust outlet are unobstructed.
	External factors are disrupting the fume hood airflow patterns or acting as a source of contamination.	See “Location Requirements” Chapter 2, “Certifying the Hood” Chapter 3, and “Safety Precautions” Chapter 4 sections of this manual. (Ref. Appendix D)
	Fume hood has improper face velocity.	Have fume hood re-certified and check remote blower exhaust system. Hood should have average face velocity of 100 fpm.
Vertical sash no longer operates smoothly	Cable is frayed or plastic protection is damaged.	Inspect cable and replace cable if worn or damaged immediately; otherwise injury could result.
	Pulley bearing is damaged.	Replace pulley, bearing or add grease.
	Cable has slipped off the pulleys.	Re-install, cable must be replaced immediately if damaged.
	Weight has broken pulleys.	Replace weight pulleys.
Combination A-Style sash no longer operates smoothly	Horizontal-sliding glass panels have come off the tracks.	Re-install horizontal-sliding glass on tracks.

PROBLEM	CAUSE	CORRECTIVE ACTION
Electrical duplex outlets no longer have power	Vertical-rising sash frame is distorted.	Place horizontal sliding glass symmetrically and pull sash down to air foil. Straighten damaged frame.
	Cable is frayed or has slipped off the pulleys.	Re-install, cable must be replaced immediately if damaged.
	Wires not connected or faulty duplex.	Check wire connection or replace duplex.
	Circuit breakers tripped in building electrical supply.	Reset circuit breakers.
Service valves no longer operate	Faulty building supply.	Inspect building supply shut off valves and appropriate pressures below the recommended 40 PSI.
	Valve no longer operates.	Replace valve and check for leaks.
	Supply line or outlet line has leaks.	Inspect line for leaks and fix any leaking plumbing connections.
Spray Nozzles no longer work	Poor water supply	Inspect building water supply.
	Clogged nozzle	Replace spray nozzles.

APPENDIX A

PROTECTOR RADIOISOTOPE COMPONENTS

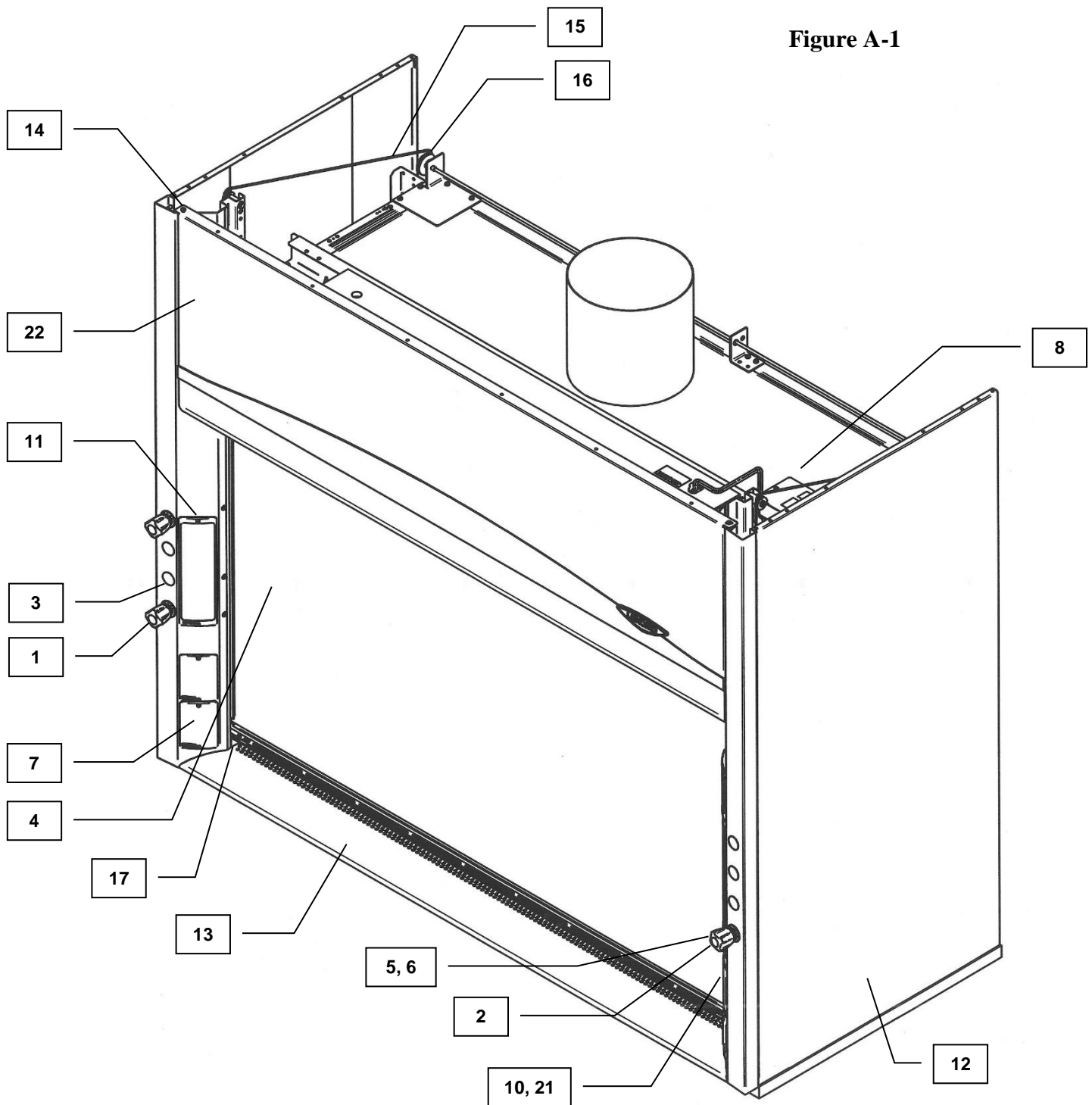
Illustration A-1 indicate the location of the following service parts:

Protector Radioisotope Replacement Parts

Item	Quantity	Part No.	Description
1A	1	9823700	Valve, Labconco (Water) 1/4" Compression Fitting
1B	1	9823701	Valve, Labconco (Water) 3/8" Compression Fitting
1C	1	9817000	Valve, Labconco 1/4" Compression Fitting (AIR, GAS, VAC, NIT, etc.)
1D	1	9817001	Valve, Labconco 3/8" Compression Fitting (AIR, GAS, VAC, NIT, etc.)
1E	1	9823702	Valve, Labconco Deionized 1/4" Compression Fitting
1F	1	9823703	Valve, Labconco Deionized 3/8" Compression Fitting
1G	1	9818000	Nut, Valve Mounting (Labconco)
2A	1	9826800	WaterSaver Valve/Gooseneck – GRN
2B	1	9826801	WaterSaver Valve/Connector (VAC) – YEL
2C	1	9826802	WaterSaver Valve/Connector (AIR) – ORG
2D	1	9826803	WaterSaver Valve/Connector (GAS) – BLU
2E	1	9826805	WaterSaver Valve/Connector (HOT WATER) – RED
2F	1	9826806	WaterSaver Valve/Connector (CW) – GRN
2G	1	9826807	WaterSaver Valve/Connector (STEAM) – BLK
2H	1	9826808	WaterSaver Valve/Connector (NITROGEN) – BRN
2I	1	9826809	WaterSaver Valve/Connector (OXYGEN) – LIGHT GREEN
2J	1	9826810	Swivel Gooseneck only – GRN
2K	1	9826812	Swivel Gooseneck only – WHITE
3	1	9818700 thru 08	Knobs (GRAY, GRN, BLU, ORG, YEL, RED, WHT, BLK, BRN)
4A	1	9818800	Hose Barb, GRAY (NEUTRAL OR ARGON) – NOT SHOWN
4B	1	9818801	Hose Barb, GREEN (COLD WATER) – NOT SHOWN
4C	1	9818802	Hose Barb, BLUE (GAS) – NOT SHOWN
4D	1	9818803	Hose Barb, ORANGE (AIR) – NOT SHOWN
4E	1	9818804	Hose Barb, YELLOW (VACUUM) – NOT SHOWN
4F	1	9818805	Hose Barb, RED (HOT WATER) – NOT SHOWN
4G	1	9818806	Hose Barb, WHITE (DEIONIZED WATER) – NOT SHOWN
4H	1	9818807	Hose Barb, BLACK (NEUTRAL OR STEAM) – NOT SHOWN
4I	1	9818808	Hose Barb, BROWN (NITROGEN) – NOT SHOWN
4J	1	9819000	Nut, Hose Barb – NOT SHOWN
5	1	9825500	Label, Knob (contains all the labels)
6	1	9818900	Lens, Knob
7A	1	9947100, 01, 02	115V Duplex Receptacle (GRAY) Right, Left 4' - 6', Left 8' w/ wires
7B	1	9818200	Cover Plate 115V Duplex
7C	1	9947103, 04, 05	115V GFCI Duplex Receptacle (GRAY) Right 4' - 6', Left 8' w/ wires
7D	1	9818100	Cover Plate, 115V GFCI
7E	1	9818300	Cover Plate, Blank

Appendix A: Protector Radioisotope Components

Item	Quantity	Part No.	Description
8A	1	1297503	LED, Direct Wired T8 x 3' – newest models use on 4' & 8' Hoods – 12 watts each
8B	1	1297504	LED, Direct Wired T8 x 4' – newest models use on 5' & 6' Hoods – 22 watts each
8C	1	9945300	LED Light Fixture, 36" – use on 4' Hoods
8D	1	9945301	LED Light Fixture, 48" – use on 5', 6' Hoods
8E	1	9945302	LED Light Fixture, 36" Combo – use on 8' Hoods
10A	1	1302301	Switch, Rocker
10B	1	1327500	Switch, Plug (Fills cutout when switch is not used)
11	1	9818400	Access Cover
12A	1	9409800	Side Panel, 24" internal deep hoods
12B	4	1885308	Screw, Machine #10-24 x .50 Phillips
13A	1	9466400	Eco-Foil 4'
13B	1	9466401	Eco-Foil 5'
13C	1	9466402	Eco-Foil 6'
13D	1	9466403	Eco-Foil 8'
14	2	1850000	Pulley, Front, 2" Dia. Nylon
15A	2	4949902	Cable, Sash 130" – NOT SHOWN
15B	2	9414010	Cable Replacement Kit 24" Interior
15C	2	9414011	Cable Replacement Kit 30" Interior
15D	1	9545800	Weight Support Bracket Kit
16	2	9709300	Plastic Pulley, (Rear 2")
17	2	9713300	Bumper, Rubber (lower sash bumper) – NOT SHOWN
18	4	1934100	Bronze Bearing, Flanged Rear – NOT SHOWN
19	4	1920100	Clamp, Cable Replacement – NOT SHOWN
20	2	9935800	Threaded Connector (to attach weight to cable) – NOT SHOWN
21	1	9946300 or 01	Wiring Harness, Main
22	1	9409601, 02, 03, 05	Front Panel, 4', 5', 6', 8'

Appendix A: Protector Radioisotope Components**Figure A-1**

APPENDIX B

PROTECTOR RADIOISOTOPE

DIMENSIONS

Radioisotope Model Widths

	4'	5'	6'	8'
A	48.00	60.00	72.00	96.00
B	38.25	50.25	62.25	86.25

Dimensions in inches. CAD layouts available upon request.

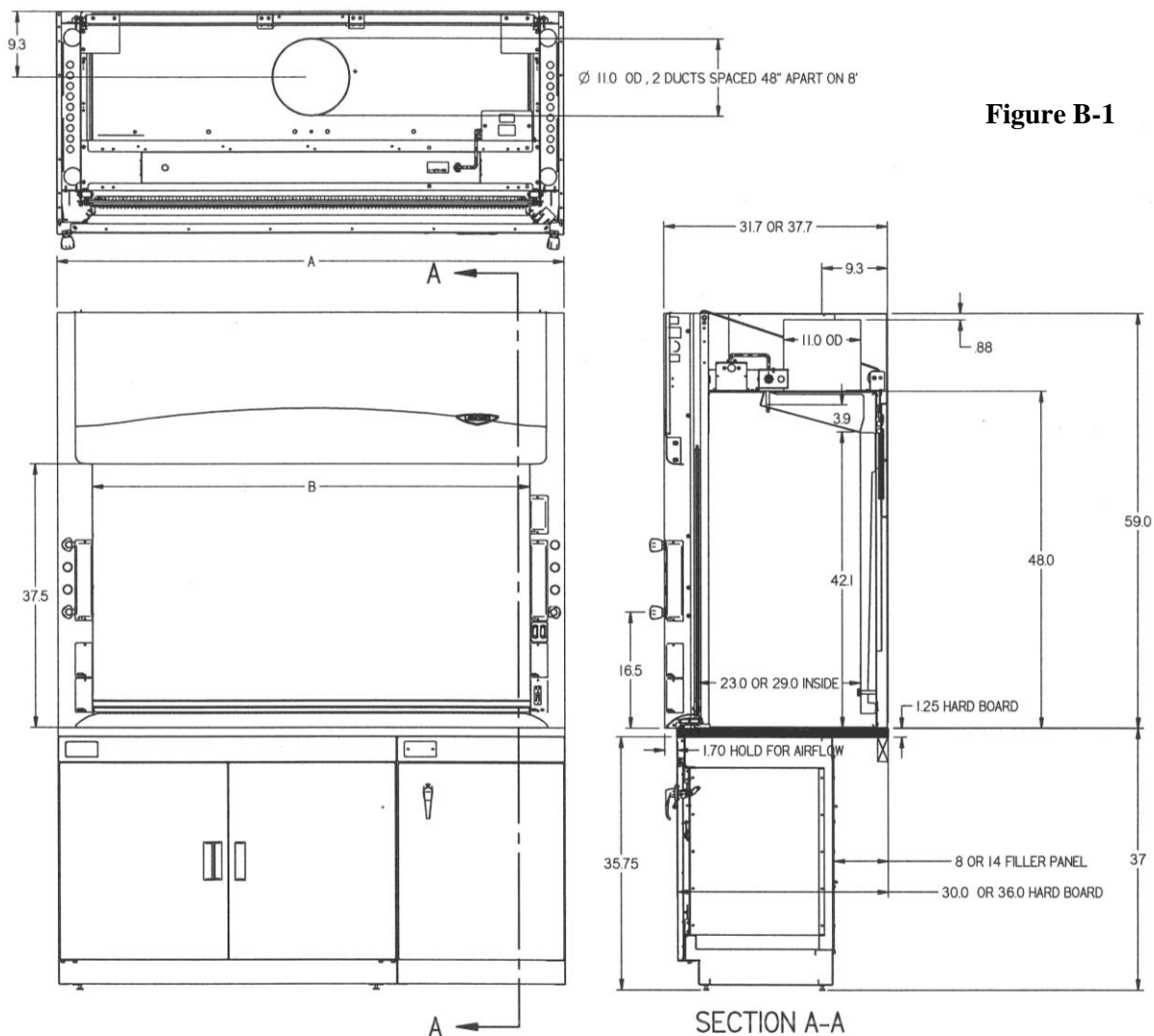
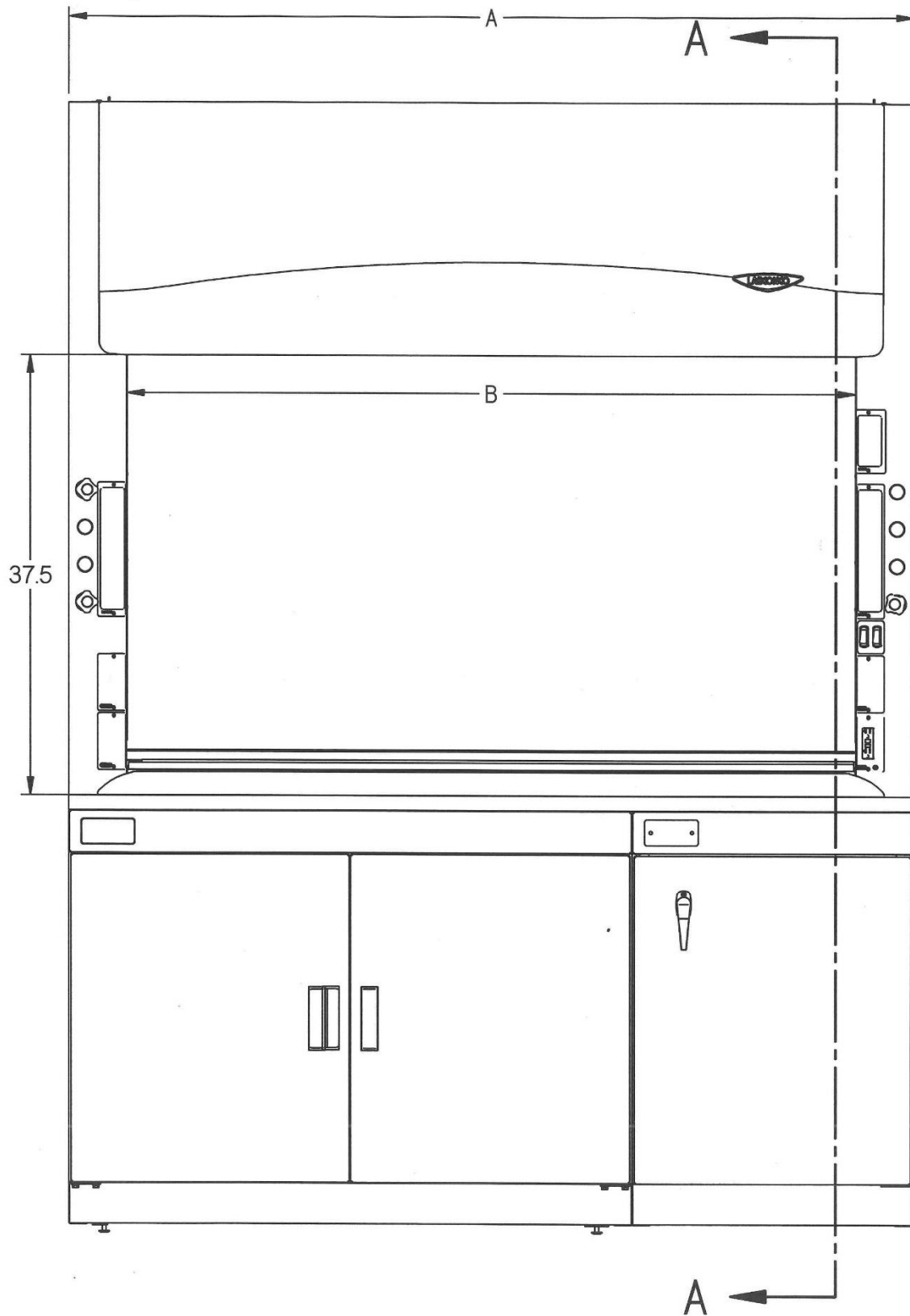
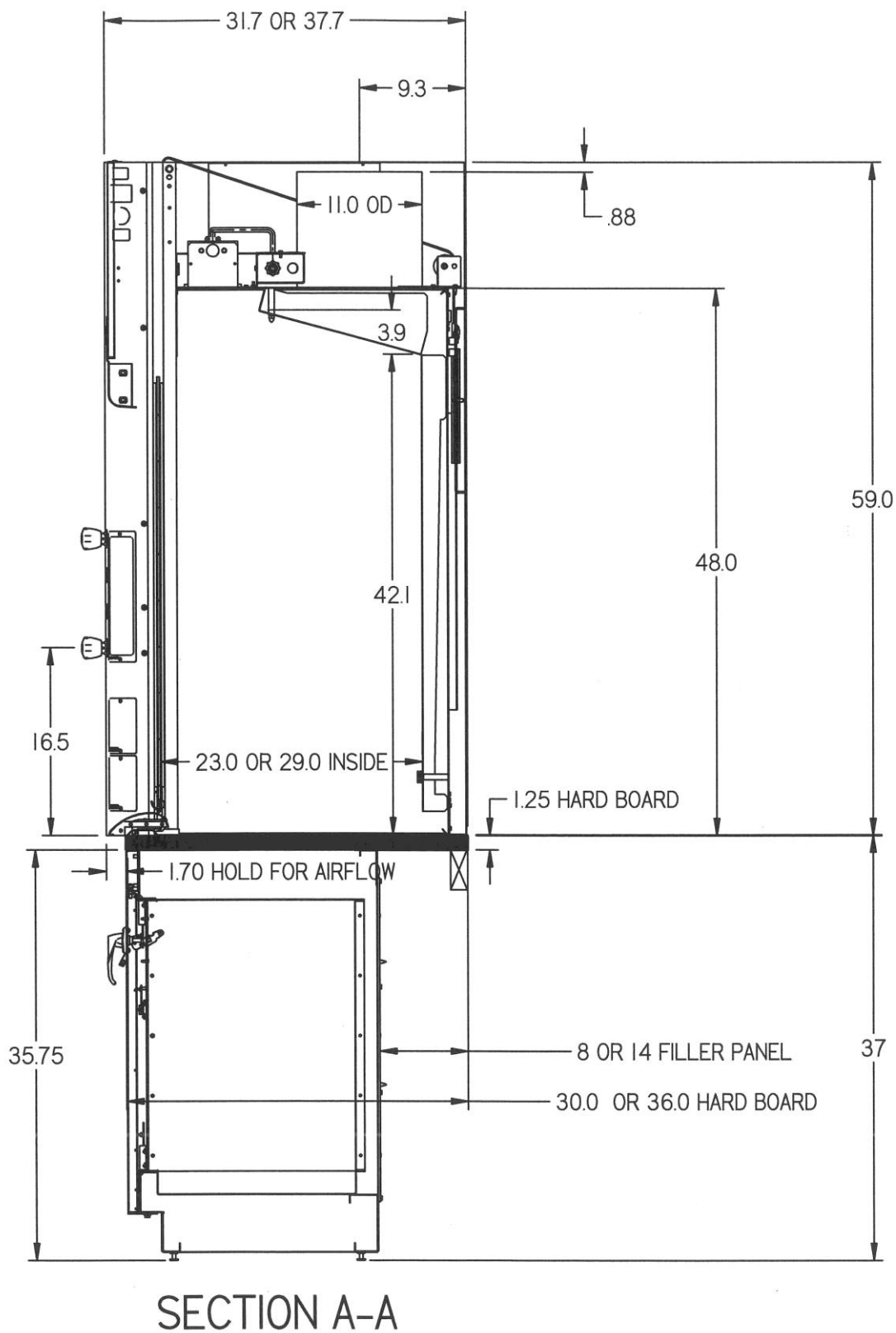


Figure B-1

Appendix B: Protector Radioisotope Dimensions**Figure B-2**

Appendix B: Protector Radioisotope Dimensions**Figure B-3**

Appendix B: Protector Radioisotope Dimensions

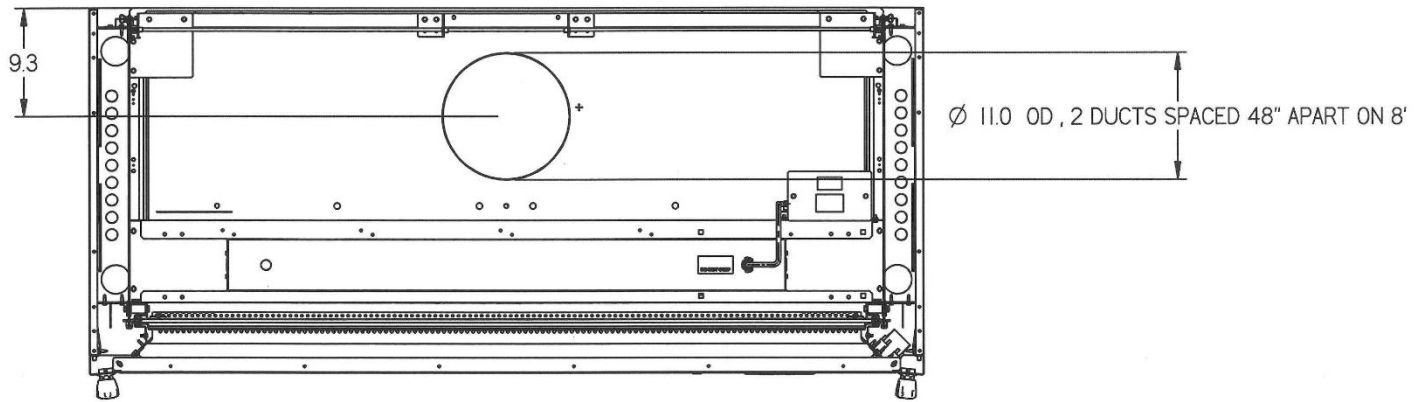


Figure B-4

APPENDIX C

PROTECTOR RADIOISOTOPE

SPECIFICATIONS

Environmental Conditions

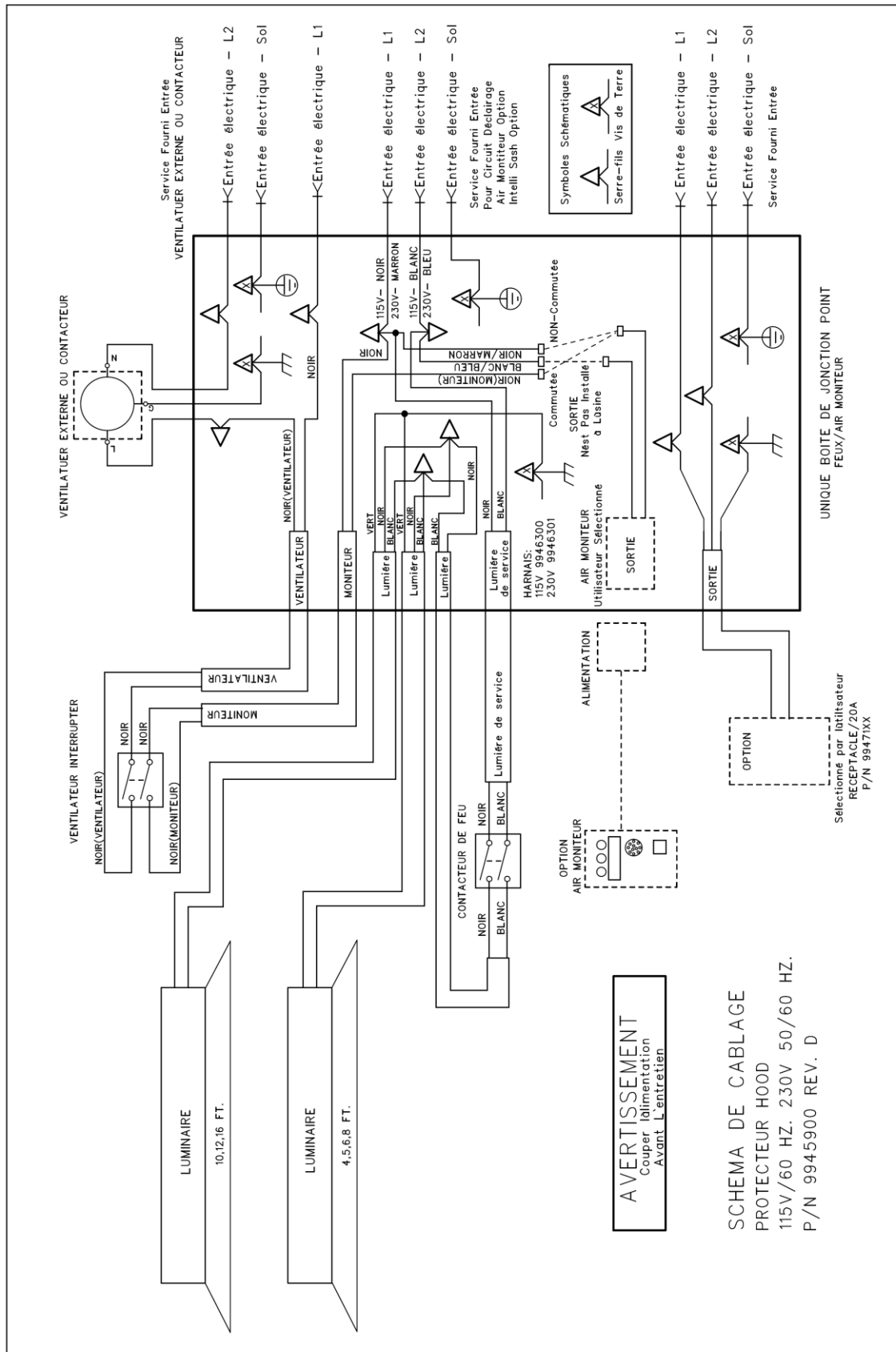
- Indoor use only.
- Maximum altitude: 10,000 feet (3,048 meters).
- Ambient temperature range: 41° to 104°F (5° to 40°C).
- Maximum relative humidity: 80% for temperatures up to 88°F (31°C), decreasing linearly to 50% relative humidity at 104°F (40°C).
- Main supply voltage fluctuations not to exceed $\pm 10\%$ of the nominal voltage.
- Transient over-voltages according to Installation Categories II (Over-voltage 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.
- Electrical Ratings

<u>Volts AC</u>	<u>Phase</u>	<u>Cycle</u>	<u>AMP*</u>
115	1	50/60	10
115	1	50	10
115	1	60	10
230	1	50/60	5
230	1	50	5
230	1	60	5

*Does not include current rating of receptacles.



Appendix C: Protector Radioisotope Specifications



APPENDIX D


SERIAL NUMBER TAG


DESCRIPTION

Serial tag includes standard information with the following changes:

The portion of the tag for electrical information is labeled with the following units: Volts AC, Phase, Cycle, AMP.

Each hood will include one of the following:

<u>Volts AC</u>	<u>Phase</u>	<u>Cycle</u>	<u>AM</u>  <u>X</u>
115	1	50/60	10X
115	1	50	10X
115	1	60	10X
230	1	50/60	5X
230	1	50	5X
230	1	60	5X

Where  may be a separate label indicating: Caution, See Manual.

The X above will be one of several possible alpha characters as defined in the manual as follows:

- X: No additional duplexes on hood, noted amperage applies.
- B: This fume hood includes **one** additional electrical receptacle, individually wired to the field wired box and individually rated as 115V, single phase, 60Hz, 20 Amps. Each duplex can be wired on a dedicated circuit rated at 20A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 20A electrical service they are wired to.
- C: This fume hood includes **two** additional electrical receptacles, individually wired to the field wired box and individually rated as 115V, single phase, 60Hz, 20 Amps. Each duplex can be wired on a dedicated circuit rated at 20A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 20A electrical service they are wired to.

- D: This fume hood includes **three** additional electrical receptacles, individually wired to the field wired box and individually rated as 115V, single phase, 60Hz, 20 Amps. Each duplex can be wired on a dedicated circuit rated at 20A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 20A electrical service they are wired to.
- E: This fume hood includes **four** additional electrical receptacles, individually wired to the field wired box and individually rated as 115V, single phase, 60Hz, 20 Amps. Each duplex can be wired on a dedicated circuit rated at 20A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 20A electrical service they are wired to.
- F: This fume hood includes **one** additional electrical receptacle, individually wired to the field wired box and individually rated as 230V, single phase, **60Hz**, 10 Amps. Each duplex can be wired on a dedicated circuit rated at 10A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 10A electrical service they are wired to.
- G: This fume hood includes **two** additional electrical receptacles, individually wired to the field wired box and individually rated as 230V, single phase, **60Hz**, 10 Amps. Each duplex can be wired on a dedicated circuit rated at 10A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 10A electrical service they are wired to.
- H: This fume hood includes **three** additional electrical receptacles, individually wired to the field wired box and individually rated as 230V, single phase, **60Hz**, 10 Amps. Each duplex can be wired on a dedicated circuit rated at 10A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 10A electrical service they are wired to.
- J: This fume hood includes **four** additional electrical receptacles, individually wired to the field wired box and individually rated as 230V, single phase, **60Hz**, 10 Amps. Each duplex can be wired on a dedicated circuit rated at 10A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 10A electrical service they are wired to.
- K: This fume hood includes **one** additional electrical receptacle, individually wired to the field wired box and individually rated as 230V, single phase, **50Hz**, 10 Amps. Each duplex can be wired on a dedicated circuit rated at 10A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 10A electrical service they are wired to.
- L: This fume hood includes **two** additional electrical receptacles, individually wired to the field wired box and individually rated as 230V, single phase, **50Hz**, 10 Amps. Each duplex can be wired on a dedicated circuit rated at 10A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 10A electrical service they are wired to.

Appendix D: Serial Number Tag Description

- M: This fume hood includes **three** additional electrical receptacles, individually wired to the field wired box and individually rated as 230V, single phase, **50Hz**, 10 Amps. Each duplex can be wired on a dedicated circuit rated at 10A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 10A electrical service they are wired to.
- N: This fume hood includes **four** additional electrical receptacles, individually wired to the field wired box and individually rated as 230V, single phase, **50Hz**, 10 Amps. Each duplex can be wired on a dedicated circuit rated at 10A or the duplexes may be ganged together on the same circuit with the total load of the ganged duplexes not exceeding the 10A electrical service they are wired to.


ANNEXE D


DESCRIPTION DE SÉRIE TAG NUMBER

Étiquette de série comprend des informations standard avec les modifications suivantes:

La partie de l'étiquette d'information électrique est étiqueté avec les unités suivantes: Volts AC, phase, cycle, AMP.

Chaque hotte comprendra une des opérations suivantes:

<u>Volts AC</u>	<u>Phase</u>	<u>Cycle</u>	<u>AMP</u> 
115	1	50/60	10X
115	1	50	10X
115	1	60	10X
230	1	50/60	5X
230	1	50	5X
230	1	60	5X

Où  peut-être une étiquette distincte indiquant: Attention, consultez le manuel.

Le X ci-dessus sera l'un des plusieurs caractères alphabétiques possibles telles que définies dans le manuel comme suit:

- X: Pas de duplex supplémentaires sur le capot, noté ampérage s'applique.
- B: Cette hotte comprend un réceptacle électrique supplémentaire, individuellement raccordés aux boîtiers câblées individuellement et classé comme 115V, monophasé, 60 Hz, 20 ampères. Chaque duplex peut être branché sur un circuit dédié évalué à 20A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 20A ils sont câblés.
- C: Cette hotte comprend deux autres prises électriques, individuellement câblés à la boîte câblées individuellement et classé comme 115V, monophasé, 60 Hz, 20 A. Chaque duplex peut être branché sur un circuit dédié évalué à 20A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 20A ils sont câblés.
- D: Cette hotte comporte trois prises électriques supplémentaires, individuellement câblés à la boîte câblées individuellement et classé comme 115V, monophasé, 60 Hz, 20 A. Chaque duplex peut être branché sur un circuit dédié évalué à 20A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 20A ils sont câblés.

Appendix D: Serial Number Tag Description

- E: Cette hotte comprend quatre autres prises électriques, individuellement câblés à la boîte câblées individuellement et classé comme 115V, monophasé, 60 Hz, 20 A. Chaque duplex peut être branché sur un circuit dédié évalué à 20A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 20A ils sont câblés.
- F: Cette hotte comprend un réceptacle électrique supplémentaire, individuellement raccordés aux boîtiers câblées individuellement et classé comme 230V, monophasé, 60 Hz, 10 ampères. Chaque duplex peut être branché sur un circuit dédié classé au 10A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 10A ils sont câblés.
- G: Cette hotte comprend deux autres prises électriques, individuellement câblés à la boîte câblées individuellement et classé comme 230V, monophasé, 60 Hz, 10 ampères. Chaque duplex peut être branché sur un circuit dédié classé au 10A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 10A ils sont câblés.
- H: Cette hotte comporte trois prises électriques supplémentaires, individuellement câblés à la boîte câblées individuellement et classé comme 230V, monophasé, 60 Hz, 10 ampères. Chaque duplex peut être branché sur un circuit dédié classé au 10A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 10A ils sont câblés.
- J: Cette hotte comprend quatre autres prises électriques, individuellement câblés à la boîte câblées individuellement et classé comme 230V, monophasé, 60 Hz, 10 ampères. Chaque duplex peut être branché sur un circuit dédié classé au 10A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 10A ils sont câblés.
- K: Cette hotte comprend un réceptacle électrique supplémentaire, individuellement raccordés aux boîtiers câblées individuellement et classé comme 230V, monophasé, 50 Hz, 10 ampères. Chaque duplex peut être branché sur un circuit dédié classé au 10A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 10A ils sont câblés.
- L: Cette hotte comprend deux autres prises électriques, individuellement câblés à la boîte câblées individuellement et classé comme 230V, monophasé, 50Hz, 10 ampères. Chaque duplex peut être branché sur un circuit dédié classé au 10A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 10A ils sont câblés.
- M: Cette hotte comporte trois prises électriques supplémentaires, individuellement câblés à la boîte câblées individuellement et classé

comme 230V, monophasé, 50Hz, 10 ampères. Chaque duplex peut être branché sur un circuit dédié classé au 10A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 10A ils sont câblés.

- N: Cette hotte comprend quatre autres prises électriques, individuellement câblés à la boîte câblées individuellement et classé comme 230V, monophasé, 50Hz, 10 ampères. Chaque duplex peut être branché sur un circuit dédié classé au 10A ou les duplex peuvent être groupés ensemble sur le même circuit que la charge totale des duplex couplées ne dépassant pas le service électrique 10A ils sont câblés.

APPENDIX E

REFERENCES

Many excellent reference texts and booklets are currently available. The following is a brief listing:

Laboratory Ventilation Standards

Federal Register 29 CFR Part 1910

Non-mandatory recommendations from "Prudent Practices".

- Fume hoods should have a continuous monitoring device
- Face velocities should be between 60-100 linear feet per minute (lfpm)
- Average 2.5 linear feet of hood space per person

Occupational Health and Safety

U.S. Department of Labor

200 Constitution Avenue N.W.

Washington, DC 20210

(202) 523-1452

Industrial Ventilation-ACGIH

- Fume hood face velocities between 60-100 lfpm
- Maximum of 125 lfpm for radioisotope hoods
- Duct velocities of 1000-2000 fpm for vapors, gasses and smoke
- Stack discharge height 1.3-2.0 x building height
- Well designed fume hood containment loss, <0.10 ppm

Industrial Ventilation, A Manual of Recommended Practice.

24th Edition, 2001

American Conference of Governmental Industrial Hygienists

1330 Kemper Meadow drive

Cincinnati, OH 45240-1634

(513) 742-2020

ASHRAE 110-1995 Method of Testing Performance of Fume Hoods

Evaluates fume hood's containment characteristics

- Three part test: Smoke generation, Face velocity profile, Tracer gas release @ 4 liters per minute
- Rated As Manufactured (AM), As Installed (AI) and As Used (AU)

American Society of Heating, Refrigerating, and Air Conditioning Engineers

1791 Tullie Circle N.E.

Atlanta, GA 30329

(404) 636-8400

ANSI Z9.5-2011 Laboratory Standard

Covers entire laboratory ventilation system.

- New and remodeled hoods shall have a monitoring device
- Ductless hoods should only be used with non-hazardous materials

American Industrial Hygiene Association

2700 Prosperity Avenue, Suite 250

Fairfax, VA 22031

(703) 849-8888

SEFA 1-2002

- Fume hood face velocities based on toxicity levels of chemicals
 - Class A – 125 to 150 fpm
 - Class B – 80 to 100 fpm
 - Class C – 75 to 80 fpm
- Test method – face velocity profile and smoke generation

Scientific Equipment & Furniture Association

1028 Duchess Drive

McLean, VA 22102

(703) 538-6007

NFPA 45 – 2002 Fire Protection for Laboratories Using Chemicals

- Laboratory hoods should not be relied on for explosion protection
- Exhaust air from fume hoods should not be recirculated
- Services should be external to the hood
- Canopy hoods only for non-hazardous applications
- Materials of construction should have flame spread of 25 or less
- 80 to 120 fpm to prevent escape

NFPA 30 – 2000 Flammable and Combustible Liquids Code

- Approved cabinets may be metal or wood
- Vent location on cabinets are required
- Venting of cabinets not a requirement

National Fire Protection Association

1 Batterymarch Park

P.O. Box 9101

Quincy, MA 02269-9101

(800) 344-3555

General References

American Conference of Governmental Industrial Hygienists. *Industrial Ventilation, A Manual of Recommended Practice*, Cincinnati, OH

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British Standards Institution, *Laboratory Fume Cupboards*. Parts 1, 2 and 3, London: 1990

Appendix E: References

Department of Labor, Occupational Safety and Health Administration, *29 CFR Part 1910, Occupational Exposures to Hazardous Chemicals in Laboratories, Final Rule*. Vol. 55, No. 21. Washington D.C.:1990

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McDermott, Henry, *Handbook of Ventilation for Contaminant Control*, 2nd Edition. Butterworth Publishers, 1985.

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NIH Guidelines for the Laboratory Use of Chemical Carcinogens. NIH Publication No. 81-2385.

Rayburn, Stephen R. *The Foundation of Laboratory Safety, A Guide for the Biomedical Laboratory*. Springer-Verlag, New York: 1990

Sax, N. Irving and Lewis, JR., Richard J. *Rapid Guide to Hazardous Chemicals in the Workplace*. Van Nostrand Reinhold, 1987.

Schilt, Alfred A. *Perchloric Acid and Perchlorates*. The G. Frederick Smith Chemical Company, Columbus, OH: 1979.

Steere, Norman. *CRC Handbook of Laboratory Safety*, 2nd Edition. CRC Press, 1971.

APPENDIX F

VAV OPEN AREA

GUIDELINES

When integrating a Labconco fume hood into a variable air volume (VAV) mechanical system, properly assessing the area opening of the fume hood is critical to ensure correct controller calibration for maintaining face velocity across all sash positions. Depending on your brand of VAV controller, you may be prompted to enter different information to arrive at this correct area.

To simplify this requirement, Labconco offers the following step-by-step procedure to ensure you have the correct information.

1. Locate the serial tag for your fume hood; usually on the lower right of the sash glass.
2. Move to the section of the document below specific to your model number.

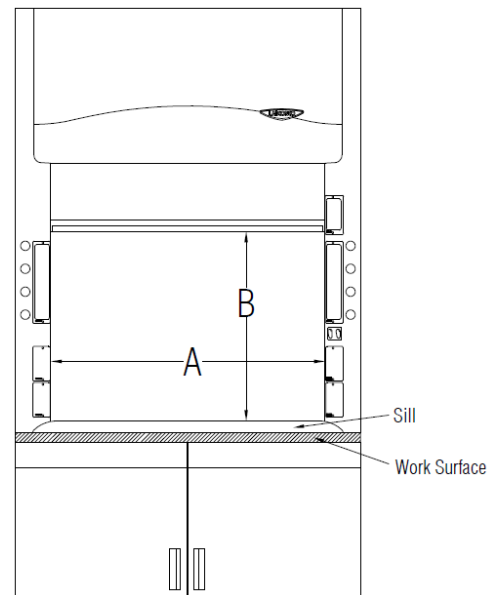
Model numbers beginning 120

1. Determine the free opening area
 - a. Width
 - i. Measure the interior width of the fume hood just behind the plane of the sash glass and enter that here:

Width Opening _____
inches = A

- b. Height*
 - i. Measure the vertical distance between the top of the lower airfoil sill and the bottom of the sash handle, and enter that here:

Vertical Opening _____ inches = B



Appendix F: VAV Open Area Guidelines

c. Free opening area

- i. Multiply the width opening times the vertical opening (A x B), and enter that here:

Free opening area = _____ square inches = C (sq.in)

- ii. Divide this by 144 to arrive at square feet, and enter that here:

Free opening area = _____ square feet = C (sq.ft)

2. Determining bypass or “leakage” area

- a. This is the opening width (A) times 0.34 inches (A x 0.34 = bypass area).

Bypass area = _____ square inches = D (sq in)

- b. Divide this by 144 to arrive at square feet

Bypass area = _____ square feet = D (sq ft)

3. Determining Total Effective Opening Area

- a. This is the Free Opening Area plus the Bypass Opening Area (C + D = Total Effective Opening Area)

Total Effective Area = _____ square inches

Total Effective Area = _____ square feet

* Industry standards call for sash height to be measured from the work surface, however, for the purposes of determining free opening height, measurement is to be taken from the top of the lower airfoil sill to the bottom of the sash handle.